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## Revision of the Wasps Genus *Ammophila* KIRBY 1798 (Hymenoptera: Apoidea: Sphecidae) of the Palearctic Region and India

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**A b s t r a c t :** A key and description to Palearctic and Indian species of *Ammophila* KIRBY 1798 are provided and 87 species are included.

The following 12 new species are described: *A. abnormis* (Pakistan), *A. antropovi* (Tunisia), *A. beaumonti* (Mongolia), *A. gusenleitneri* (Algeria, Tunisia, Morocco), *A. haladai* (Turkey), *A. menkei* (Tunisia), *A. ohli* (Uzbekistan), *A. pakistana* (Pakistan), *A. persica* (Iran), *A. rauschi* (Kazakhstan, Kyrgyzstan), *A. schmideggeri* (Israel) and *A. zimmermannae* (Kazakhstan, Tajikistan).

The hitherto unknown males of *A. adelpha* KOHL 1901, *A. afghanica* BALTHASAR 1957, *A. mitlaensis* ALFIERI 1961 and *A. sinensis* SICKMANN 1894 are described.

The following taxa described as varieties or as subspecies are raised to full species status: *Ammophila atlantica* ROTH 1928, *Ammophila electa* KOHL 1901, *Ammophila nigrina* F. MORAWITZ 1889, *Ammophila vagabunda* F. SMITH 1856, *Ammophila striaticollis* F. MORAWITZ 1889, *Coloptera theryi* GRIBODO 1894 and *Ammophila touareg* Ed. ANDRÉ.

The following are new synonyms in *Ammophila* (the valid name is listed last): *A. atripes* F. SMITH 1852, *A. basalis* F. SMITH 1856, *A. dimidiata* F. SMITH = *A. clavus* (FABRICIUS 1775); *A. dantoni* ROTH in NADIG 1933 ♂ only = *A. erminea* KOHL 1901; *A. philomela* NURSE 1903 = *A. gracillima* TASCHENBERG 1896; *A. ruficollis* F. MORAWITZ 1890 = *A. occipitalis* F. MORAWITZ 1890; *A. arnaudi* TSUNEKI 1967 = *A. pubescens* CURTIS 1836; *A. dantoni* ROTH in NADIG 1933 ♀ only = *A. rubripes* SPINOLA 1839; *A. subassimilis* STRAND 1913, *A. sjoestedti* GUSSAKOVSKIJ 1934 = *A. sickmanni* KOHL 1901; *planicollaris* LI & YANG 1990 = *A. sinensis* SICKMANN 1894; *A. solowjofkae* MATSUMURA 1911 = *A. vagabunda* F. SMITH 1856; *A. judaeorum* KOHL 1901, *A. barbara* var. *A. airensis* BERLAND 1950 = *A. theryi* (GRIBODO 1894).

Lectotypes for 20 species and the neotype of *Ammophila holosericea* (FABRICIUS 1793) have been designated.

**K e y w o r d s :** Apoidea, Sphecidae, *Ammophila*, Key.

### Introduction

This study resulted from my attempts to identify the large collection of *Ammophila* in the Biologiezentrum Linz, Austria. I found that the only key to Palearctic species was KOHL's (1906) old treatment of the Palearctic fauna, supplemented by TSUNEKI's (1971)

key to the species of Mongolia. In addition to my key of the genus *Podalonia* FERNALD 1927 of the Old World I decided to produce a key of *Ammophila* of the Palearctic Region and India. Dissection of male genitalia revealed that these structures offer good species characters for the most species. I have also included a key to genera of Ammophilini.

Eighty seven species are included in this paper, but I have excluded from the keys the species described by LI & HE 2000 (*A. pseudoheydeni*), LI & XUE 1998 (*A. heteroclypeola*), LI & YANG 1989 (*A. menghaiana*, *A. xinjiangana*), LI & YANG 1990 (*A. planicollaris*, *A. rubigege*, *A. clypeola*, *A. borealis*), LI & YANG 1995 (*A. globifrontalis*) and YANG & LI 1989 (*A. ganquana*, *A. obliquestriolae*, *A. pachythoracalis*, *A. untumoris*) as I have not seen any material. Dr. Yan Chengjin kindly translated the Chinese descriptions into English for me and these are included under the species treatments. Not included in the keys are also *A. arabica* KIRBY 1900: 24, described from a single damaged female that is lost (GUICHARD 1988: 129), *A. areolata* WALKER 1871: 19 ♂, poorly described and lost and *Ammophila nitida* FISCHER de WALDHEIM 1834, also poorly described and lost (not in ZMHU, M. Ohl in lit.).

This study is based on the examination of 5.957 specimens. Terminology follows BOHART & MENKE (1976).

**Note** : Dark wings can become pale in old specimens and stylopized specimens have a shorter petiole than usual.

The complete information of the material of OÖLM examined, including the localities, dates of captures and the names of the collectors will be published in a separate paper. However, a list of localities for rare species is provided here.

### Sources of material

The following is a list of institutional and private collections where the material is housed (the capitalized abbreviations preceding the names are used in the text to designate these collections). The name of the contact persons is given in parentheses.

BMNH.....	The Natural History Museum, London, Great Britain (David Notton)
CAS.....	California Academy of Sciences, San Francisco, California, USA (Wojciech J. Pulawski, Vincent F. Lee)
Coll. Jacobs.....	Private collection of Hans-Joachim Jacobs, Ranzin, Germany
Coll. Schmid-Egger.....	Private collection of Christian Schmid-Egger, Berlin, Germany
DEI.....	Deutsches Entomologisches Institut, Müncheberg, Germany (Andreas Taeger)
HALLE.....	Zoologisches Institut der Martin-Luther Universität, Halle, Germany (Karla Schneider)
MNHN.....	Muséum National d'Histoire Naturelle, Paris, France (A. Touret-Alby, L. Albenga)
MSNG.....	Museo Civico di Storia Naturale di Genova, Genova, Italy (Roberto Poggi)
MSNT.....	Museo Regionale di Scienze Naturali, Torino, Italy (Luca Picciau)
NHMW.....	Naturhistorisches Museum, Wien, Austria (Dominique Zimmermann)
NMPC.....	Entomologické Oddělení Národního Muzea, Praha-Kunratice, Czech Republic (Jan Macek)
NRS.....	Naturhistoriska Riksmuseet, Stockholm, Sweden (Hege Vårdal)

OÖLM .....	Oberösterreichisches Landesmuseum, Linz, Austria (Fritz Gusenleitner)
OXUM.....	Oxford University Museum of Natural History, Oxford, Great Britain (James E. Hogan)
SALAMANCA.....	Universidad de Salamanca, Area de Zoologia, Salamanca, Spain (Severiano F. Gayubo)
TMB .....	Természettudományi Múzeum, Budapest, Hungary (Sandor Csösz)
USNM .....	United States National Museum, Washington, USA (David G. Furth)
ZIN .....	Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (Sergey A. Belokobylskiy)
ZMHU .....	Museum für Naturkunde der Humboldt-Universität zu Berlin, Berlin, Germany (Michael Ohl)
ZMMU .....	Zoological Museum, Moscow State University, Moscow, Russia (Alexander V. Antropov)
ZÜRICH.....	Eidgenössische Technische Hochschule, Institut für Pflanzenwissenschaften, Entomologische Sammlung, Zürich, Switzerland (Andreas Müller)

### Key to Genera of Ammophilini

from BOHART & MENKE 1976, slightly modified

1. Episternal sulcus curving back to scrobe from subalar fossa, then extending obliquely ventrad to anteroventral area of mesopleuron (Fig. 1); New World forms ....  
..... *Eremnophila* MENKE
- Episternal sulcus extending straight down from subalar fossa (in some species absent), not passing through scrobe (Fig. 2)..... 2
2. Claws in most specimens simple but if with single basal tooth on inner margin then mouthparts very long, galea attaining base of stipes when folded ..... 3
- Claws with one or two basal teeth on inner margin; galea not extending beyond stipes midlength when folded and in most specimens shorter; Old World forms ..... 4
3. Apex of sternum I (petiole) meeting and in many specimens overlapping base of sternum II (Fig. 3); spiracle of tergum I located before apex of sternum I (in profile); petiole in many specimens bent upward at level of base of tergum I.....  
..... *Podalonia* FERNALD
- Apex of sternum I not reaching base of sternum II, intervening space mostly long and consisting of membrane and ligament (Fig. 4); spiracle of tergum I located at or beyond apex of sternum I; sternum I in many specimens bent downward or straight at level of base of tergum I..... *Ammophila* W. KIRBY
4. Mesothoracic venter with anteromedian projection behind forecoxa; petiole socket nearly completely surrounded by propodeal tergum (Fig. 6); inner orbits of female strongly converging below; midtibia with single spur ..... *Eremochares* GRIBODO
- Mesothoracic venter without anteromedian projection, at most obtusely angled (exception: *Parapsammophila foleyi*); petiole socket broadly bounded ventrally by T-shaped propodeal sternum (Fig. 5); inner orbits of female only slightly converging below or parallel or diverging below; midtibia with two spurs (one may be reduced or absent) ..... 5

5. Foretarsomere I of female strongly asymmetrical, its outer apex prolonged (Fig. 9); free margin of male clypeus rounded or truncate; tarsi in most specimens with arolia; male gonostyle of usual shape ..... *Parapsammophila* TASCHENBERG
- Foretarsomere I of female nearly symmetrical, outer apex only slightly produced (fig. 10); male clypeus triangular; arolia absent; male gonostyle of unusual shape (Fig. 8)..... *Hoplammophila* DE BEAUMONT

## Key to Palearctic and Indian species of *Ammophila* W. KIRBY 1798

### Females

Unknown and not included: *A. abnormis*, *A. altigena*, *A. antropovi*, *A. djaouak*, *A. menkei*, *A. meridionalis*, *A. obliquetriolae*, *A. pachythoracalis*, *A. pakistana*, *A. persica*, *A. pseudonasuta*, *A. vetuberosa*.

1. Forewing with three submarginal cells (Fig. 11); (in some specimens of *A. gracillima* and *A. heydeni* 1 r-m crossvein is lost, resulting in two submarginal cells) ..... 2
- Forewing with two submarginal cells (Fig. 12) ..... 80
2. Gaster partly or all red or yellowish-brown (in *A. clavus* only petiole and tergum I red)..... 3
- Gaster all black ..... 78
3. Propodeal enclosure covered with erect setae or with appressed silvery or brown setae, at least along midline (in some specimens setae fine and short) ..... 4
- Propodeal enclosure all glabrous ..... 58
4. Pronotal collar dorsally not transversely ridged (in some specimens of *A. holosericea* slightly transversely striate). Scutum transversely ridged or punctate..... 5
- Pronotal collar dorsally and scutum distinctly transversely ridged..... 48
5. Legs all or partly red or yellowish-brown..... 6
- Legs black..... 35
6. Outer margin of foretarsomere I with basal tooth (Fig. 14); propodeal enclosure with appressed silvery setae along midline, obliquely striate and glabrous laterally; pronotal collar laterally: Fig. 172; clypeus: Fig. 17. 18.5-20 mm. Egypt, Israel, Saudi Arabia, Libya, Tunisia ..... *A. guichardi* DE BEAUMONT
- Outer margin of foretarsomere I without basal tooth; propodeal enclosure setose along midline or all..... 7
7. Pronotum not elongate, much broader than long; appressed silvery setae forming spots on pronotal lobe and mesopleuron, or evenly distributed on pronotal lobe, mesopleuron, metapleuron and propodeal side; wings yellowish or hyaline ..... 8
- Pronotum elongate (Figs 118, 120-125); head and thorax all covered with dense appressed silvery setae; wings hyaline..... 29
8. Pronotal collar evenly rounded dorsally ..... 9
- Pronotal collar with prominent median tubercle (Fig. 116), or angulate laterally (Fig. 117), or with concave anterior surface (Fig. 138) ..... 27
9. Ventral margin of clypeus semicircularly emarginated medially (Figs 26, 27); mandible (except apex) red..... 10



- Ventral margin of clypeus without distinct emargination; mandible black or red ..... 11
- 10. Thorax covered with appressed silvery setae that completely obscure underlying sculpture; clypeus: Fig. 26. 18-22 mm. Algeria, Tunisia, Spain ..... *A. albotomentosa* MORICE
- Thorax covered with appressed silvery setae that do not obscure underlying sculpture, at least on metapleuron; clypeus (Fig. 27). 17-21.5 mm. Israel, Egypt, Libya, Morocco, Tunisia ..... *A. hemilauta* KOHL
- 11. Gastral apex black, with metallic shine ..... 12
- Gastral apex more or less black, without metallic shine ..... 16
- 12. Clypeus distinctly elongate (Fig. 28); metapleuron without appressed silvery setae ..... 13
- Clypeus not elongate; metapleuron with or without appressed silvery setae ..... 14
- 13. Pronotal collar black. 16-19.5 mm. Spain, Portugal, southern France ..... *A. laevicollis* Ed. ANDRÉ
- Pronotal collar and petiole black or red. 18-22 mm. North Africa ..... *A. nasuta* LEPELETIER and *A. atlantica* ROTH  
(I cannot provide reliable separation characters for these two species, but geographical distribution is of some help: *A. atlantica* is known only from western and north-western coast of Morocco, whereas *A. nasuta* is widely distributed in North Africa).
- 14. Appressed silvery setae forming spots on pronotal lobe, mesopleuron along mesopleural suture and on propodeum posterolaterally; petiole black; clypeus: Fig. 29. 20-22 mm. Algeria, Tunisia, Morocco ..... *A. holosericea* (FABRICIUS)
- Mesopleuron, metapleuron and propodeum laterally all covered with appressed silvery setae; petiole at least ventrally red ..... 15
- 15. Tergum V and VI pruinose. 17-20 mm. Egypt, Malta, Israel, Iran, Yemen, Libya, Morocco, Chad, Sudan ..... *A. dubia* KOHL
- Terga V and VI not pruinose. 15-19.5 mm. Jordan, Yemen, Saudi Arabia, Algeria, Tunisia, Morocco, West Sahara, Chad ..... *A. poecilocnemis* MORICE
- 16. Length over 25 mm; clypeus elongate, median lobe truncate (Fig. 32); wings yellow mesally, with brownish margin; scutum transversely ridged and punctate. Syria, Israel, Jordan, Lebanon, Yemen, Oman, Algeria ..... *A. insignis* F. SMITH
- Length less than 25 mm; clypeus differently shaped; wings slightly yellow or almost hyaline; scutum transversely ridged or irregularly punctate ..... 17
- 17. Scutum transversely ridged and punctate ..... 18
- Scutum punctate, at most with rudimentary ridges ..... 21
- 18. Supra-antennal lamellate projection well developed (Fig. 18); appressed silvery setae forming spots on pronotal lobe, mesopleuron and propodeum laterally. 18-22 mm. Algeria, Tunisia, Morocco ..... *A. gusenleitneri* DOLLFUSS **nov.sp.**
- Supra-antennal lamellate projection absent; appressed silvery setae forming spots or evenly distributed on pronotal lobe, mesopleuron, metapleuron and propodeal side ..... 19
- 19. Appressed silvery setae forming spots on pronotal lobe, mesopleuron and propodeum posterolaterally; metapleuron not or distinctly less covered with appressed silvery setae; gastral apex in most specimens not pruinose. 15-22 mm. Central Europe (partly), Mediterranean Region, Yemen, Iran, Armenia, Central Asia, China, Pakistan, India, Indonesia (Timor). (In specimens from China see also *A. pseudoheydeni* LI & HE 2000) ..... *A. heydeni* DAHLBOM

- Appressed silvery setae evenly distributed on pronotal lobe, mesopleuron, metapleuron and propodeal side; gastral apex pruinose .....20
- 20. Midtibia with one spur (at most a small second spur present); clypeal disk convex in lateral view (Fig. 85). 17.5-23.5 mm. Jordan, Israel, Syria, Arabian Peninsula, Africa..... *A. rubripes* SPINOLA
- Midtibia with two long spurs; clypeal disk on ventral half flat in lateral view (Fig. 86). 20-21 mm. Egypt, Oman, Sudan .....*A. horni* VON SCHULTHESS
- 21. Appressed silvery setae forming spots on pronotal lobe, mesopleuron along mesopleural suture and on propodeum posterolaterally; hindtibia black or red..... 22
- Appressed silvery setae evenly distributed on pronotal lobe, mesopleuron, metapleuron and propodeal side; hindtibia red ..... 23
- 22. Propodeal enclosure along midline coarsely reticulate and covered with erect silvery-white setae, laterally with coarse transverse rugae and glabrous; clypeal disk nearly flat; scutum dull, coarsely irregularly punctate (punctures 0-3 diameters apart); hindtibia black; mandible black. 17-21 mm. India, Nepal, Laos, Thailand, Vietnam. (In specimens from China see also *A. menghaiana* LI & YANG 1989)..... *A. laevigata* F. SMITH
- Propodeal enclosure all covered with fine appressed silvery setae and white erect setae; clypeal disk distinctly convex (Fig. 15); scutum shiny and densely punctate; hindtibia basally red; mandible red (except apex). 20 mm. Tajikistan, Kazakhstan ..... *A. zimmermannae* DOLLFUSS **nov.sp.**
- 23. Clypeus markedly elongate (Figs 40, 631) ..... 24
- Clypeus insignificantly elongate (Figs 34, 41, 42) ..... 25
- 24. North Africa, Iran, Jordan Israel, Arabian Peninsula, West Sahara. 14-21 mm..... *A. erminea* KOHL
- Kazakhstan. 16 mm..... *A. iliensis* KAZENAS
- 25. Clypeal disk nearly flat. 14-16(21?) mm. India, Pakistan..... *A. smithii* F. SMITH
- Clypeal disk convex..... 26
- 26. Mandible and scape red. 20 mm. Mongolia (Gobi), East Iran.....*A. roborowskyi* KOHL
- Mandible and scape nearly all black. 14 mm. Mongolia..... *A. pulawskii* TSUNEKI
- 27. Pronotal collar with anterior surface concave in lateral view (Fig. 138); appressed silvery setae evenly distributed on pronotal lobe, mesopleuron, metapleuron and propodeal side; gastral apex black, without metallic shine. 18-21.5 mm. Jordan, Oman, Syria .....*A. exsecta* KOHL
- Pronotal collar differently shaped; appressed silvery setae forming spots on pronotal lobe, mesopleuron and propodeum posterolaterally; gastral apex with metallic shine ..... 28
- 28. Pronotal collar with prominent median tubercle (Figs 116, 139). 19-22 mm. Egypt (Sinai Peninsula), Israel, Jordan, Algeria, Morocco, Western Sahara ..... *A. strumosa* KOHL
- Pronotal collar distinctly angulate laterally (Figs 117, 140). 18.5-20.5 mm. Egypt (Sinai Peninsula), Israel, Syria, Libya, Algeria, Tunisia ..... *A. quadraticollis* A. COSTA
- 29. Mesothoracic venter prominent anteriorly, concave for reception of forecoxa, depression margined by carina that forms one median or two lateral projections; gastral socket not attaining propodeal dorsum ..... 30
- Mesothoracic venter not prominent anteriorly; gastral socket attaining propodeal dorsum or nearly so ..... 34

30. Propodeal enclosure along midline broadly covered with appressed silvery setae, laterally transversely ridged and glabrous; clypeus narrowed ventrally (Fig. 46), clypeal disk distinctly convex (Fig. 87); gastral apex truncate: Fig. 24. 13-15 mm. Uzbekistan, Kazakhstan..... *A. lativalvis* GUSSAKOVSKIJ
- Propodeal enclosure all covered with appressed silvery setae; clypeus differently shaped; gastral apex acute..... 31
31. Forecoxal venter with small apical tooth (Fig. 25); mesothoracic venter prominent anteriorly, margined by carina that forms median projection; pronotal collar not ridged (Figs 122, 142); clypeus: Fig. 47. 14-17 mm. Iran, Afghanistan, Kazakhstan, Turkmenistan, Tajikistan, Uzbekistan ..... *A. dentigera* GUSSAKOVSKIJ
- Forecoxal venter without tooth; mesothoracic venter prominent anteriorly, margined by carina that forms one lateral projection on each side; pronotal collar dorsally in some specimens with indistinct transverse ridges ..... 32
32. Pronotal collar transversely microstriate, with anterior carina slightly prominent and slightly emarginate medially (Figs 121, 193); scutum transversely microstriate beneath appressed setae. 17 mm. Mongolia (Gobi) ..... *A. beaumonti* DOLLFUSS **nov. sp.**
- Pronotal collar anteriorly not prominent, not emarginate, in most specimens slightly transversely ridged; scutum more or less transversely ridged beneath appressed setae..... 33
33. Clypeus not elongate (Fig. 48); clypeal disk nearly flat (Fig. 88); pronotal collar in lateral view not concave (Fig. 143); appressed silvery setae sparse on thorax dorsally. 16-19 mm. North Africa, Saudi Arabia, Israel, Syria, Ethiopia, Sudan, Central Asia, China, India..... *A. gracillima* TASCHENBERG
- Clypeus slightly elongate (Fig. 53); clypeal disk distinctly convex (Fig. 109); pronotal collar in lateral view concave (Fig. 144); appressed silvery setae of head and thorax dense, obscuring underlying sculpture. 16-20 mm. Iran, Kazakhstan, Turkmenistan, Uzbekistan ..... *A. tekkensis* GUSSAKOVSKIJ
34. Propodeal enclosure covered with appressed silvery setae along midline, laterally obliquely striate and glabrous; arolia large; free margin of clypeus slightly narrowing (Fig. 49). 17.5 mm. Kazakhstan, Turkmenistan..... *A. induta* KOHL
- Propodeal enclosure all covered with appressed silvery setae; arolia small; free margin of clypeus broadly rounded, with shallow median emargination (Fig. 50). 15-18 mm. Egypt (Sinai Peninsula), Saudi Arabia, Jordan, Israel, Oman, Yemen, Algeria, Tunisia, Morocco, Niger, Chad, Central Asia..... *A. producticollis* MORICE
35. Gastral apex black, without metallic shine ..... 36
- Gastral apex with metallic shine (in *A. sabulosa* metallic shine darkened) ..... 44
36. Supra-antennal lamellate projection high (Fig. 19); propodeal enclosure along median line irregularly rugose and covered with erect setae, laterally transversely ridged and glabrous..... 37
- Supra-antennal lamellate projection less developed or absent; propodeal enclosure medially covered with erect setae, laterally glabrous or all covered with erect setae..... 38
37. Scutum distinctly transversely ridged and punctate, in many specimens shiny; stripe along mesopleural suture covered with appressed silvery setae; length 14-21 mm. China, Korea, Mongolia ..... *A. sickmanni* KOHL
- Scutum dull, punctate, punctures partly transversely confluent; mesopleuron without or at most with small spot of appressed silvery setae; most specimens longer: 20-24 mm. Russian Far East (Vladivostok area), Japan, Korea, China, Mongolia, India ..... *A. vagabunda* F. SMITH

38. Episternal sulcus ending at level of scrobe; claws with small basal tooth (50×, Fig. 7) which is evanescent in some specimens; clypeal lobe in most specimens steplike near free margin; apex of petiole closer to sternum II than to fore end of tergum I; midtibia concave posterodorsally..... 39
- Episternal sulcus extending to anteroventral margin of pleuron; claws nondentate; clypeus not steplike; apex of petiole closer to fore end of tergum I than to sternum II; midtibia not concave posterodorsally..... 40
39. Petiole not thickened, longer than hindtarsomere I (1: 1.3); anterior surface of pronotal collar nearly rectangular in lateral view (Fig. 148). 14-22 mm. Central Europe (partly), Italy, France, Greece, Spain, Cyprus, Syria, Jordan, Turkey, Armenia, Iran, Central Asia..... *A. hungarica* MOCSÁRY
- Petiole thickened, as long as hindtarsomere I (Fig. 197); anterior surface of pronotal collar more oblique in lateral view (fig. 149). 19 mm. Spain..... *A. leclercqi* MENKE
40. Petiole red..... 41
- Petiole black..... 42
41. Free margin of clypeus arcuate, without distinct median lobe or lateral teeth (Fig. 56); erect setae black. 23 mm. India (Himalaya). (In specimens from China see also *A. menghaiana* LI & YANG 1989)..... *A. brevipennis* BINGHAM
- Free margin of clypeus with distinct median lobe, lateral teeth distinctly developed (Fig. 58); erect setae silvery-white. (13)17-18 mm. Egypt, Israel..... *A. mitlaensis* ALFIERI
42. Scutum shiny or slightly dull, densely, coarsely punctate (punctures 0-1 diameter apart); mesopleuron punctate like scutum. 20.5-22.5 mm. Iran, Nepal, Tibet, India (Himalaya), Pakistan..... *A. punctata* F. SMITH
- Scutum shiny, punctate and laterally distinctly transversely striate or dull and finely transversely striate; mesopleuron reticulate or punctato-rugos..... 43
43. Pronotal collar dorsally smooth and shiny; scutum shiny, coarsely punctate and laterally transversely striate. 16.5-20 mm. Israel, Jordan, Syria, Turkey, Afghanistan..... *A. assimilis* KOHL
- Pronotal collar dull; scutum dull and finely transversely striate. 15-19 mm. Spain, Portugal, France (Pyrénées-Orientales)..... *A. modesta* MOCSÁRY
44. Propodeal enclosure all covered with erect setae; patch of appressed silvery setae on mesopleuron; supra-antennal lamellate projection less developed, less than diameter of midocellus (Fig. 20); 14-24.5 mm. Europe, Turkey, Iran, Central Asia, Mongolia. (In specimens from China see also *A. xinjiangana* LI & YANG 1989).  
..... *A. sabulosa* (LINNAEUS)
- Propodeal enclosure medially covered with erect setae, laterally glabrous or all covered with setae; supra-antennal lamellate projection more or less high, more than diameter of midocellus; mesopleuron with or without appressed silvery setae.. 45
45. Clypeus and frons not covered with appressed silvery setae, also mesopleuron in most specimens without appressed setae..... 46
- Clypeus, frons and mesopleuron covered with appressed silvery setae..... 47
46. Scutum and mesopleuron smooth, finely and more or less regularly punctate, punctures well defined, not confluent, more than one diameter apart. 20.5-27 mm. Russian Far East (Primorskiy Krai), China, Japan, Korea..... *A. infesta* F. SMITH
- Scutum and mesopleuron rugose, coarsely punctate, punctures partly confluent. 20-24 mm. Russian Far East (Vladivostok area), Japan, Korea, China, Mongolia, India..... *A. vagabunda* F. SMITH

47. Mandible black; scutum medially irregularly coarsely punctate (punctures 0-1 diameter apart), laterally finely transversely striate. 19-22.5 mm. Taiwan, India.....  
.....*A. formosensis* TSUNEKI
- Mandible red (except apex); scutum coarsely punctate, punctures transversely confluent, forming short transverse rugae. 23 mm. Morocco, Algeria.....  
.....*A. touareg* Ed. ANDRÉ
48. Mesothoracic venter anteriorly prominent, concave for reception of forecoxa, depression margined by carina that in some specimens forms one projection on each side; pronotum elongate; episternal sulcus ending at level of scrobe or extending to anteroventral margin of pleuron..... 49
- Mesothoracic venter anteriorly not prominent; pronotum elongate or not; episternal sulcus ending at level of scrobe ..... 54
49. Legs black; mesothoracic venter anteriorly with transverse carina that forms one projection on each side or not; episternal sulcus extending to anteroventral margin of pleuron..... 50
- Legs at least partly red; mesothoracic venter anteriorly with transverse carina that forms one projection on each side; episternal sulcus ending at level of scrobe or extending to anteroventral margin of pleuron..... 51
50. Mesothoracic venter distinctly prominent anteriorly, with transverse carina that forms one projection on each side. 15.5-18.5 mm. China, Mongolia.....  
.....*A. sinensis* SICKMANN
- Mesothoracic venter slightly prominent anteriorly, without projections but with transverse carina. 23 mm. Kazakhstan, Russia (Primorskiy Krai), Turkey. (In specimens from Spain see also *A. striata nadigi* ROTH 1932. In specimens from China see also *A. untumoris* YANG & LI 1989).....*A. striata* MOCSÁRY
51. Propodeal enclosure all covered with appressed silvery setae and longitudinally ridged..... 52
- Propodeal enclosure covered with appressed silvery setae along midline, laterally coarsely transversely ridged and glabrous ..... 53
52. Clypeus not elongate (Fig. 48), clypeal disk nearly flat (Fig. 95); pronotal collar and scutum covered with sparse appressed silvery setae that do not obscure underlying sculpture; pronotal collar convex in lateral view (Figs 143, 160). 16-19 mm. North Africa, Saudi Arabia, Ethiopia, Sudan, Syria, Israel, Central Asia, China, India .....*A. gracillima* TASCHENBERG
- Clypeus slightly elongate (Fig. 53), clypeal disk distinctly convex (Fig. 109); head (except vertex), thorax and propodeum (including propodeal enclosure) covered with dense appressed silvery setae that obscure most of underlying sculpture; pronotal collar concave in lateral view (Fig. 144). 16-20 mm. Iran, Kazakhstan, Turkmenistan, Uzbekistan ..... *A. tekkensis* GUSSAKOVSKI
53. Pronotal collar with wide triangular antero-median concavity that intersects anterior transverse carina (Fig. 131); episternal sulcus ending at level of scrobe; clypeus slightly elongate (Fig. 66). 20-25.5 mm. East Turkey, Iran, Kazakhstan, Turkmenistan, Mongolia. (In specimens from China see also *untumoris* YANG & LI 1989).....*A. elongata* FISCHER DE WALDHEIM
- Pronotal collar without anterior concavity, anterior transverse carina not intersected (Fig. 132); episternal sulcus extending to anteroventral margin of pleuron; clypeus not elongate (Fig. 67). 18-21 mm. Israel, Jordan, Iran, Turkmenistan, Uzbekistan, Mongolia.....*A. occipitalis* F. MORAWITZ
54. Legs black; arolia large; clypeus characteristically shaped (Figs 23, 16). 20-21 mm. Uzbekistan .....*A. ohli* DOLLFUSS **nov.sp.**

- Legs partly red; arolia small or absent; clypeus differently shaped ..... 55
- 55. Free margin of clypeus with erected tooth on each side (Fig. 68), clypeal disk flat (Fig. 97); arolia small but distinct. 18 mm. Israel .....  
..... *A. schmideggeri* DOLLFUSS **nov.sp.**
- Freemargin of clypeus without erected tooth on each side, clypeal disk flat or convex; arolia lacking ..... 56
- 56. Gastral apex black, without metallic shine but with dark ferruginous tip; top of head, pronotum and scutum with stiff black bristles (Fig. 164). 21-26 mm. Yemen, Oman, Saudi Arabia ..... *A. punti* GUICHARD
- Gastral apex with more or less developed metallic shine; erect setae different ..... 57
- 57. Head, thorax, flagellum and legs variably red, also gaster to varying extent, in most specimens only petiole red; wings slightly yellowish; gaster with slight metallic shine. 16.5-21.5 mm. Egypt, Israel, Jordan, Iran, Iraq, Algeria, Libya, Tunisia, Morocco, Yemen, Saudi Arabia, Chad ..... *A. haimatosoma* KOHL
- Head, pronotum and scutum black, in some specimens clypeus and scutum partly red; wings distinctly yellowish-brown; gaster metallic black. 19-32 mm. Australia, Indonesia, Laos, China, Japan, India, Nepal. (In specimens from China see also *A. globifrontalis* LI & YANG 1995) ..... *A. clavus* (FABRICIUS)
- 58. Third submarginal cell not petiolate, at most triangular; gastral apex in most species with metallic shine; legs black ..... 59
- Third submarginal cell petiolate (Fig. 13), in some specimens triangular; gastral apex without metallic shine; legs black or red ..... 67
- 59. Pronotal collar dorsally transversely striate and scutum transversely finely striate or coarsely ridged ..... 60
- Pronotal collar dorsally not transversely striate, scutum striate or not ..... 64
- 60. Episternal sulcus ending at level of scrobe; clypeus elongate and medially narrowly, deeply emarginate (Fig. 74); clypeal disk ventrally concave, dorsally convex (Fig. 99). 19-20 mm. Northern Iran, Kazakhstan, Kyrgyzstan, Uzbekistan, China ..... *A. adelpha* KOHL
- Episternal sulcus extending to anteroventral margin of pleuron; clypeus differently shaped ..... 61
- 61. Supra-antennal lamellate projection well developed; petiole red. 15-24 mm. Algeria, Libya, Tunisia, Morocco ..... *A. electa* KOHL
- Supra-antennal lamellate projection absent; petiole red or black ..... 62
- 62. Mesopleuron and propodeum laterally with patch of appressed silvery setae; petiole red or black ..... 63
- Mesopleuron and propodeum laterally without appressed silvery setae; petiole dorsally dark reddish-brown. 17-21 mm. China, Kazakhstan .....  
..... *A. terminata turkestanica* KOHL
- 63. Pronotal collar and scutum coarsely ridged (Fig. 167); petiole red; free margin of clypeus medially emarginate (Fig. 72). 16-22 mm. Russia, Azerbaijan, Kazakhstan ....  
..... *A. gussakovskii* DOLLFUSS **nom.nov.**
- Pronotal collar and scutum finely striate (Fig. 168); petiole black; free margin of clypeus not emarginate. 14-18.5 mm. Western, central and southern Europe, Turkey, Algeria, Tunisia, Canary Islands, Kazakhstan, Kyrgyzstan, China, Mongolia. (In China see also *A. rubigena* LI & YANG 1990) ..... *A. terminata* F. SMITH



64. Episternal sulcus ending at level of scrobe; clypeus elongate, medially narrowly, deeply emarginate (Fig. 74); clypeal disk ventrally concave, dorsally convex (Fig. 99). 19-20 mm. Northern Iran, Kazakhstan, Kyrgyzstan, Uzbekistan, China.....  
..... *A. adelpha* KOHL
- Episternal sulcus extending to anteroventral margin of pleuron; clypeus differently shaped..... 65
65. Appressed silvery (mostly brassy) setae forming characteristic pattern: on frons lateral spots on each side of midline, spot on pronotal lobe, band along mesopleural suture, patch on propodeum posterolaterally, and dorsal patch on mid- and hindcoxae; pronotal collar and scutum covered with fine brassy appressed setae, that do not obscure underlying sculpture; foreleg and posterior surface of head ventrally covered with long black erect setae; clypeal disk distinctly convex; scutum and mesothoracic venter distinctly transversely ridged. 17-22 mm. Turkey, Russia (Volgograd area), Ukraine, Kazakhstan, Kyrgyzstan.....  
..... *A. sareptana* KOHL
- Appressed silvery setae forming different pattern; other characters different..... 66
66. Head (except vertex), thorax (except metapleuron), propodeum (except propodeal enclosure), coxa and trochanter covered with dense appressed silvery setae that obscure underlying sculpture; scutum medially sparsely punctate, laterally finely transversely striate, admedian line well defined, broad. 13-17 mm. Mongolia.....  
..... *A. tsunekii* MENKE
- Appressed silvery setae not so dense, not concealing integument; scutum finely transversely striate with small admedian line. 14-18 mm. Western, central and southern Europe, Turkey, Algeria, Tunisia, Canary Islands, Kazakhstan, Kyrgyzstan, China, Mongolia.....*A. terminata* F. SMITH
67. Legs partly red. 13 mm. Russia (Siberia).....*A. cellularis* GUSSAKOVSKIJ
- Legs black..... 68
68. Supra-antennal lamellate projection well developed..... 69
- Supra-antennal lamellate projection absent ..... 70
69. Scutum shiny, distinctly transversely striate and coarsely punctate; mesopleuron without appressed silvery setae. 15.5 mm. Afghanistan (3800m), Kyrgyzstan, Tajikistan, Uzbekistan .....*A. sarekandana* BALTHASAR
- Scutum dull, transversely microstriate and sparsely punctate; mesopleuron with small patch of appressed silvery setae along mesopleural suture. 14.5-16.5 mm. Kyrgyzstan, China, Mongolia. (In specimens from China see also *A. ganquana* YANG & LI 1989).....*A. deserticola* TSUNEKI
70. Head, thorax and propodeum without appressed silvery setae; scutum shiny, transversely striate and punctate; petiole black or red; erect setae on head, prothorax and foreleg black. 16-18 mm. Kazakhstan, Kyrgyzstan .....  
..... *A. rauschi* DOLLFUSS **nov.sp.**
- At least propodeum posterolaterally covered with appressed silvery setae; other characters different ..... 71
71. Pronotal collar dorsally distinctly transversely striate; clypeus, frons, pronotal lobe, mesopleuron and propodeum posterolaterally covered with dense appressed silvery setae. 13 mm. China.....*A. striaticollis* F. MORAWITZ
- Pronotal collar dorsally not distinctly transversely striate; other characters different ...  
..... 72
72. Venter of petiole with long erect setae; propodeal enclosure transversely dull striate, with interspaces in most specimens markedly microsculptured ..... 73



- Venter of petiole without erect setae, at most short ones basally; propodeal enclosure shiny or dull..... 74
- 73. Frontal setae black; clypeus without or only with traces of appressed silvery setae. 15-19 mm. Europe, Turkey, Kazakhstan, Mongolia, China. (In specimens from China see also *A. borealis* LI & YANG 1990)..... *A. pubescens* CURTIS
- Frontal setae silvery-white; clypeus and frons covered with appressed silvery setae. 17 mm. Afghanistan (Nuristan 2700m), Pakistan (Chitra 3500m)..... *A. afghanica* BALTHASAR
- 74. Appressed silvery setae only on propodeum posterolaterally and as dorsal stripe on hindcoxa; in some specimens small spot on mesopleuron and traces of fine appressed silvery setae on clypeus; erect setae on head, prosternum and forecoxa black; scutum shiny, transversely striate and punctate. 13-16.5 mm. Turkey, Armenia, Tajikistan, Kyrgyzstan, Kazakhstan, Mongolia ..... *A. mongolensis* TSUNEKI
- Mesopleuron, pronotal lobe and propodeum posterolaterally with distinct appressed silvery setae, in some specimens fine and sparse, but then scutum dull ..... 75
- 75. Scutum shiny, distinctly transversely striate and coarsely punctate; clypeal free margin in most specimens with median lobe delimited laterally by small tooth ..... 76
- Scutum dull and transversely microstriate; clypeal free margin in most specimens without distinct median lobe ..... 77
- 76. Petiole red (in some specimens basal half darkened); clypeus and frons covered with dense appressed silvery setae. 15.5-18.5 mm. Azerbaijan, Kazakhstan, Turkmenistan. (In specimens from China see also *A. heterochypeola* LI & XUE 1998)..... *A. separanda* F. MORAWITZ
- Petiole black; clypeus and frons without dense appressed silvery setae, or in some specimens with sparse ones. 17-19 mm. Turkey..... *A. haladai* DOLLFUSS **nov.sp.**
- 77. Clypeus, frons, pronotal lobe, large patch on mesopleuron and propodeum posterolaterally covered with dense appressed silvery setae, remaining areas of thorax pruinose; propodeal enclosure dull, obliquely striate. 14-15 mm. Mongolia..... *A. asiatica* TSUNEKI
- Pronotal lobe, small patch on mesopleuron and propodeum posterolaterally covered with appressed silvery setae, in some specimens clypeus and frons covered with traces of short appressed silvery setae; propodeal enclosure shiny, obliquely striate. 12-16 mm. Europe, Central and East Asia. (In China see also *A. chypeola* LI & YANG 1990) ..... *A. campestris* LATREILLE
- 78. Submarginal cell III petiolate (Fig. 13); propodeal enclosure glabrous. 20 mm. China..... *A. nigrina* F. MORAWITZ
- Submarginal cell III not petiolate; propodeal enclosure glabrous or covered with erect setae ..... 79
- 79. Gastral apex black, without metallic shine; supra-antennal lamellate projection high (Fig. 19); wings black-violet shiny; propodeal enclosure medially covered with erect setae; pronotal collar punctate. 19-23 mm. Mongolia, China, Korea ..... *A. sickmanni* KOHL, black form
- Gastral apex black, with metallic shine; supra-antennal lamellate projection low; wings brown; propodeal enclosure glabrous; pronotal collar finely transversely striate. 15-19.5 mm. Egypt (Sinai Peninsula), Israel, Jordan ..... *A. honorei* ALFIERI
- 80. Legs black; propodeal enclosure all glabrous; mesothoracic venter not prominent; appressed silvery setae on clypeus and frons and/or on pronotal lobe and propodeum posterolaterally; posterior margin of forecoxa without spine. 15.5-19 mm. Turkey, Jordan, Israel, Syria, Algeria, Morocco, Tunisia ..... *A. barbara* (LEPELETIER)

- Legs partly red; propodeal enclosure medially pruinose, laterally glabrous; mesothoracic venter prominent, with transverse carina that forms one small projection on each side; clypeus and frons covered with dense appressed silvery setae; head (except vertex), thorax and propodeum laterally pruinose; posterior margin of forecoxa with small spine (difficult to see). 13-18 mm. Israel, Jordan, Syria, Iran, Egypt (Sinai Peninsula), Algeria, Morocco. (Note: some specimens of *A. gracillima* and *A. heydeni* in which 1 r-m crossvein is lost run to here).....  
.....*A. theryi* (GRIBODO)

### Males

Unknown and not included: *A. cellularis*, *A. clypeola*, *A. leclercqi*, *A. nigrina*, *A. ohli*, *A. roborowskyi*, *A. striaticollis*, *A. untumoris*, *A. xinjiangana*.

1. Forewing with three submarginal cells (in some specimens of *A. gracillima* and *A. heydeni* 1 r-m crossvein is lost, resulting in two submarginal cells)..... 2
  - Forewing with two submarginal cells (Fig. 12)..... 85
2. Gaster partly or all red or yellowish-brown (in *A. clavus* only tergum I ventrally red)..... 3
  - Gaster all black, with metallic shine ..... 84
3. Propodeal enclosure covered with erect setae or with appressed silvery setae at least along midline (in some specimens fine and short)..... 4
  - Propodeal enclosure glabrous ..... 64
4. Pronotal collar dorsally not transversely ridged (in some specimens of *A. holosericea* slightly transversely rugose); scutum transversely ridged or punctate ..... 5
  - Pronotal collar dorsally and scutum distinctly transversely ridged..... 54
5. Legs partly or all red or yellowish-brown (Note: in some specimens of *A. laevigata* they may be only slightly red) ..... 6
  - Legs black..... 43
6. Pronotal collar not elongate, distinctly broader than long; appressed silvery setae forming spots on pronotal lobe and mesopleuron or evenly distributed on pronotal lobe, mesopleuron, metapleuron and propodeal side; wings hyaline or yellowish ..... 7
  - Pronotal collar elongate, nearly as long as broad (Figs 312-316); head, pronotal lobe, mesopleuron, metapleuron and propodeal side evenly covered with appressed silvery setae; wings hyaline ..... 36
7. Clypeus of usual shape, elongate or not; genitalia usually shaped..... 8
  - Clypeus distinctly elongate, in some species remarkably shaped (Figs 206, 216, 224); genitalia usually shaped (*A. guichardi*, *A. insignis*) or unusually shaped (*A. nasuta*-group de Beaumont 1955; Figs 390-400)..... 23
8. Gastral apex red or black, without metallic shine; scutum transversely ridged or punctate..... 9
  - Gastral apex black with metallic shine; scutum in most specimens transversely ridged..... 21
9. Anterior surface of pronotal collar slightly concave in lateral view (Fig. 138). Genitalia as in *A. rubripes* (Figs 378, 448, 513, 567). Length 20mm. Jordan, Syria, Oman ..... *A. exsecta* KOHL
  - Pronotal collar rounded in lateral view ..... 10

10. Clypeus elongate (Fig. 216); mesopleuron without appressed silvery setae; wings distinctly yellow; gonostyle abruptly narrowing toward apex (Fig. 374); penis valve: Fig. 444. Length 24-30 mm. Syria, Jordan, Israel, Lebanon, Yemen, Oman, Algeria ..... *A. insignis* F. SMITH
- Clypeus differently shaped; mesopleuron with appressed silvery setae; wings slightly yellowish-brown; genitalia differently shaped. Length less than 23 mm..... 11
11. Appressed silvery setae forming spots on pronotal lobe and mesopleuron; metapleuron not or inconspicuously covered with appressed setae ..... 12
- Pronotal lobe, mesopleuron, metapleuron and propodeal side evenly covered with appressed silvery setae (if suspecting *A. heydeni* and *A. rubripes*, see penis valves in apical view, Figs 565 and 567) ..... 15
12. Supra-antennal lamellate projection well developed (Fig. 18); scutum transversely ridged. 15-22 mm. Algeria, Tunisia, Morocco ..... *A. gusenleitneri* DOLLFUSS **nov.sp.**
- Supra-antennal lamellate projection absent; scutum transversely ridged or punctate .... 13
13. Scutum transversely ridged; propodeal enclosure all covered with erect setae; mesopleuron coarsely punctato-rugose; penis valve: Figs 446, 511. 14-20 mm. Central Europe (partly), Mediterranean Region, Armenia, Iran, Yemen, Central Asia, China, Pakistan, India, Indonesia (Timor). (In specimens from China see also *A. pseudoheydeni* LI & HE 2000)..... *A. heydeni* DAHLBOM
- Scutum punctate, punctures 0-2 diameters apart; propodeal enclosure different; mesopleuron punctate ..... 14
14. Propodeal enclosure all coarsely reticulate, covered with erect setae and fine appressed silvery setae; penis valve in lateral view (Fig. 504). 19 mm. Kazakhstan, Tajikistan ..... *A. zimmermannae* DOLLFUSS **nov.sp.**
- Propodeal enclosure medially coarsely reticulate and covered with erect setae, laterally coarsely transversely ridged and glabrous; mesopleuron punctate, punctures 0-2 diameters apart; subapical spine of penis valve rectangularly elongate (Fig. 447). 17-18 mm. China, India, Nepal, Laos, Thailand, Vietnam. (In specimens from China see also *A. menghaiana* LI & YANG 1989)..... *A. laevigata* F. SMITH
15. Scutum transversely ridged; penis valve distinctly narrowed basally in apical view (Fig. 567). 17.5-22 mm. Jordan, Israel, Syria, Arabian Peninsula, Africa ..... *A. rubripes* SPINOLA
- Scutum punctate or smooth..... 16
16. Propodeal enclosure medially irregularly rugose, covered with fine appressed silvery setae and with erect setae, laterally transversely ridged and glabrous..... 17
- Propodeal enclosure all covered with erect setae and appressed silvery setae ..... 19
17. Penis valve preapically with extremely short spines (Fig. 449); clypeus: Fig. 222; clypeus, frons, thorax and propodeal side covered with dense appressed silvery setae and long erect setae. 17-20 mm. Tajikistan..... *A. meridionalis* KAZENAS
- Penis valve preapically with short or long spines; appressed silvery setae and erect setae more or less evenly distributed..... 18
18. Clypeus: Fig. 221; clypeal disk convex; penis valve with short preapical spines (Figs 450, 514). 17-19 mm. Egypt, Israel, Saudi Arabia, Libya, Tunisia ..... *A. guichardi* DE BEAUMONT
- Clypeus: Fig. 252; clypeal disk nearly flat (Fig. 368); penis valve with slightly longer preapical spines (Figs 505, 560). 19.5 mm. Pakistan ..... *A. pakistana* DOLLFUSS **nov.sp.**

19. North Africa, Jordan, Israel, Iran, Arabian Peninsula; penis valve evenly rounded apically (Fig. 569), laterally (Fig. 451), ventrally (Fig. 515); head, thorax and propodeum covered with dense appressed silvery setae that obscure most of underlying sculpture. 16-17 mm..... *A. erminea* KOHL  
 - Asia..... 20
20. India, Pakistan. Clypeus (Fig. 248); clypeal disk flat. Genitalia: Figs 435, 502, 558, 605. 14-17 mm..... *A. smithii* F. SMITH  
 - Mongolia. Genitalia: Figs 625-630. 15.0-16.5 mm..... *A. pulawskii* TSUNEKI  
 - Kazakhstan. Genitalia: Figs 637-641. 19 mm..... *A. iliensis* KAZENAS
21. Appressed silvery setae forming spots on pronotal lobe, mesopleuron along mesopleural suture and propodeum posterolaterally; pronotal collar in some specimens slightly transversely rugose. 19.5-20 mm. Algeria, Tunisia, Morocco..... *A. holosericea* (FABRICIUS)  
 - Appressed silvery setae evenly distributed on pronotal lobe, mesopleuron, metapleuron and propodeal side; pronotal collar not transversely rugose ..... 22
22. Gonostyle apically broad in lateral view (Fig. 383); penis valve laterally: Fig. 453; gastral apex not pruinose. 16-18 mm. Jordan, Morocco, Algeria, Tunisia, Western Sahara, Saudi Arabia, Yemen, Chad..... *A. poecilocnemis* MORICE  
 - Gonostyle apically not broad in lateral view (Fig. 384); penis valve laterally: Fig. 454; gastral apex pruinose. 15-17 mm. Egypt, Israel, Malta, Iran, Yemen, Libya, Morocco, Sudan, Chad..... *A. dubia* KOHL
23. Clypeus elongate and truncate (Figs 216, 221); clypeal disk all convex; gonostyle of usual shape (Figs 374, 380); gastral apex black without metallic shine ..... 24  
 - Clypeus remarkably elongate (Figs 198-207, 224); clypeal disk concave on ventral half; gonostyle unusually shaped (Figs 390-400); gastral apex with or without metallic shine..... 25
24. Mesopleuron without dense appressed silvery setae; scutum distinctly transversely ridged; gastral segments III-VII black; penis valve in lateral view: Fig. 444; 24-30 mm. Syria, Jordan, Israel, Lebanon, Yemen, Oman, Algeria..... *A. insignis* F. SMITH  
 - Mesopleuron with appressed silvery setae; scutum not transversely ridged; gastral segments V-VII black; penis valve in lateral view: Fig. 450. 17-19 mm. Israel, Egypt, Libya, Tunisia, Saudi Arabia..... *A. guichardi* DE BEAUMONT
25. Hypostomal carina with tooth near mandible base (Fig. 21); clypeal lobe widely truncate, almost not narrowing anterad (Fig. 224), raised dorsally (Fig. 332); genitalia: Figs 390, 573. 18-22 mm. Egypt, Oman, Sudan ..... *A. horni* SCHULTHESS  
 - Hypostomal carina without tooth near mandible base, but in some species mandible with basal tooth; clypeus more or less narrowing anterad, not raised dorsally, in some species emarginate or with apical tubercle..... 26
26. Pronotal collar with prominent median tubercle (Fig. 307); anterior surface of pronotal collar almost vertical (Fig. 268); clypeal lobe narrowing ventrally, truncate apically (Fig. 198), clypeal disk distinctly concave in ventral half (Fig. 333); penis valve markedly thickened (Fig. 457); gastral apex with metallic shine. 19-22 mm. Jordan, Israel, Egypt (Sinai Peninsula), Algeria, Morocco, Western Sahara ..... *A. strumosa* KOHL  
 - Pronotal collar not tuberculate; clypeus ventrally truncate or emarginate or with small tubercle; penis valve differently shaped; gastral apex with or without metallic shine ..... 27

27. Free margin of clypeus truncate (Fig. 199); gastral apex without metallic shine; mandible inner margin with basal tooth; labrum with preapical spine; penis valve in lateral view characteristically shaped (Fig. 455). 18.5 mm. Tunisia.....  
 ..... *A. menkei* DOLLFUSS **nov.sp.**
- Free margin of clypeus with apical tubercle or emarginate; gastral apex with or without metallic shine; mandible inner margin with or without basal tooth; labrum with or without apical or preapical spine; penis valve differently shaped ..... 28
28. Free margin of clypeus with apical tubercle (Figs 200, 201)..... 29
- Free margin of clypeus emarginate (Figs 202, 204-207, 225, 226)..... 30
29. Labrum without apical spine; mandible inner margin with short basal tooth; pronotal collar red or black; genitalia: Figs 393, 458, 520, 575. 15-20 mm. North Africa..... *A. nasuta* LEPELETIER
- Labrum with apical spine; mandible inner margin with long basal tooth; pronotal collar black; genitalia: Figs 394, 459, 522, 576. 15-18.5 mm. Portugal, Spain, southern France..... *A. laevicollis* Ed. ANDRÉ
30. Genitalia extremely large (3 × 2 mm); penis valve ending in more or less elongate spine (Figs 461, 463); gastral apex without metallic shine ..... 31
- Genitalia smaller; penis valve differently shaped; gastral apex with or without metallic shine ..... 32
31. Clypeal free margin widely emarginate: dorsal view: Fig. 202, apical view: Fig. 203; metapleuron in most specimens not covered with appressed silvery setae; penis valve ending in long spine (Fig. 461); gonostyle apically broadened and concave: lateral view: Fig. 395, ventral view: Fig. 396; labrum with apical spine. 18-21 mm. Israel, Egypt ..... *A. pseudonasuta* BYTINSKI-SALZ
- Clypeal free margin narrowly emarginated (Fig. 204); metapleuron covered with appressed silvery setae, but not as dense as on mesopleuron; penis valve ending in shorter spine (Fig. 463); gonostyle apically not broadened and not concave (Fig. 397); labrum with preapical spine. 21.5 mm. Tunisia.....  
 ..... *A. antropovi* DOLLFUSS **nov.sp.**
32. Gaster red or scarcely darkened apically, without metallic shine ..... 33
- Gastral apex black, with metallic shine..... 35
33. Clypeus relatively short (Fig. 225), clypeal disk convex but straight in ventral half (Fig. 339); appressed silvery setae fully concealing integument; penis valve characteristically shaped (Fig. 456); gonostyle laterally: Fig. 385. 16-20 mm. Algeria, Tunisia, Spain ..... *A. albotomentosa* MORICE
- Clypeal lobe distinctly elongate (Figs 205, 226), ventral half distinctly concave (Fig. 340, 341); appressed silvery setae not concealing integument at least on pronotal collar and metapleuron; genitalia differently shaped ..... 34
34. Mandibular inner margin with two subapical teeth, without basal tooth; labrum with apical spine; penis valve laterally: Fig. 460; gonostyle laterally: Fig. 398. 16-18 mm. Israel, Egypt, Libya, Tunisia, Morocco ..... *A. hemilauta* KOHL
- Mandibular inner margin with onesubapical tooth and with obtuse basal tooth; labrum with preapical spine; penis valve laterally: Fig. 462, gonostyle laterally: Fig. 399. 20-21.5 mm. Egypt, Libya, Tunisia..... *A. djaouak* DE BEAUMONT
35. Pronotal collar distinctly angulate laterally (Fig. 117); penis valve laterally: Fig. 464; gonostyle laterally: Fig. 400; sternum VIII roof-like, not emarginate. 18-22 mm. Israel, Egypt (Sinai Peninsula), Algeria, Libya, Tunisia.....  
 ..... *A. quadraticollis* A. COSTA

- Pronotal collar rounded laterally; penis valve laterally: Fig. 465; gonostyle laterally: Fig. 386; sternum VIII deeply emarginate, not roof-like. 18.5-20.5 mm. Morocco..... *A. atlantica* ROTH
- 36. Mesothoracic venter not prominent anteriorly ..... 37
- Mesothoracic venter prominent anteriorly, concave for reception of forecoxa, depression margined by carina that forms one median or two lateral projections ..... 39
- 37. Propodeal enclosure all covered with appressed silvery setae; pronotal collar laterally: Fig. 273. 15 mm. Jordan, Israel, Egypt (Sinai Peninsula), Saudi Arabia, Oman, Yemen, Algeria, Morocco, Chad, Niger.....*A. producticollis* MORICE
- Propodeal enclosure medially broadly covered with appressed silvery setae, laterally obliquely ridged and glabrous..... 38
- 38. Pronotal collar slightly elongate, in lateral view: Fig. 266; penis valve laterally: Fig. 450.17-19 mm. Israel, Egypt, Saudi Arabia, Libya, Tunisia .....  
..... *A. guichardi* DE BEAUMONT
- Pronotal collar distinctly elongate, in dorsal view: Fig. 313; penis valve laterally: Fig. 469. 17.5 mm. Kazakhstan, Turkmenistan ..... *A. induta* KOHL
- 39. Clypeal free margin with one tubercle on each side laterodorsally (Fig. 210); propodeal enclosure medially broadly covered with appressed silvery setae, laterally transversely ridged and glabrous; gastral apex broadly rounded (Fig. 609); sternum VIII ventrally convex; genitalia characteristically shaped (Figs 405, 466). 14-15 mm. Kazakhstan, Uzbekistan..... *A. lativalvis* GUSSAKOVSKIJ
- Clypeal free margin without tubercles; propodeal enclosure all covered with appressed silvery setae; genitalia and gastral apex differently shaped..... 40
- 40. Pronotal collar emarginate anteriorly (Fig. 315); genitalia: Figs 406, 468, 527, 586. 13.5-14.5 mm. Mongolia ..... *A. beaumonti* DOLLFUSS nov.sp.
- Pronotal collar not emarginate anteriorly..... 41
- 41. Forecoxa ventrally with small tooth (Fig. 25); mesothoracic venter prominent anteriorly, margined by carina that forms median projection; gonostyle in lateral view with long erect setae dorsally and ventrally (Fig. 407); pronotal collar not rugose. 14-18.5 mm. Afghanistan, Iran, Turkmenistan, Kazakhstan, Tajikistan, Uzbekistan ..... *A. dentigera* GUSSAKOVSKIJ
- Forecoxa ventrally without tooth; mesothoracic venter prominent anteriorly, margined by carina that forms lateral projection on each side; gonostyle laterally with long erect setae dorsally only (Figs 418, 419); pronotal collar in some specimens with indistinct transverse rugae ..... 42
- 42. Appressed silvery setae not dense, not fully concealing sculpture.13-18.5 mm. North Africa, Arabian Peninsula, Ethiopia, Sudan, Syria, Israel, Central Asia, China, India ..... *A. gracillima* TASCHENBERG
- Appressed silvery setae dense, fully concealing sculpture. 15-18 mm. Kazakhstan, Turkmenistan, Uzbekistan ..... *A. tekkensis* GUSSAKOVSKIJ
- 43. Hypostomal carina with blunt tooth near mandibular socket (Fig. 610); frons and scutum densely, coarsely punctate (punctures 0-1 diameter apart); mesopleuron with appressed silvery setae. 18-20 mm. India (Himalaya), Nepal, Tibet, Pakistan, Iran. (In specimens from China see also *A. menghaiana* LI & YANG 1989) .....  
..... *A. punctata* F. SMITH
- Hypostomal carina without tooth near mandibular socket; frons and scutum differently shaped; mesopleuron with or without appressed silvery setae ..... 44
- 44. Supra-antennal lamellate projection conspicuously developed (Fig. 19)..... 45
- Supra-antennal lamellate projection inconspicuous or absent..... 49



45. Scutum and mesopleuron finely and more or less evenly punctate, punctures well delimited, not confluent; propodeal enclosure medially covered with erect setae, laterally glabrous; gastral apex in most specimens with metallic shine. 17-25 mm. Japan, China, Korea, Russian Far East (Primorskiy Kray) ..... *A. infesta* F. SMITH
- Scutum more or less irregularly coarsely to finely transversely rugose and coarsely punctate, punctures partly confluent; propodeal enclosure laterally glabrous or all covered with erect setae; gastral apex black or with metallic shine ..... 46
46. Gastral apex black, without metallic shine; propodeal enclosure medially covered with erect setae, glabrous laterally. 15-19.5 mm. China, Korea, Mongolia ..... *A. sickmanni* KOHL
- Gastral apex black, with metallic shine (in some specimens slightly darkened as in *A. sabulosa*); propodeal enclosure all or nearly all covered with erect setae ..... 47
47. Algeria, Morocco. Free margin of clypeus nearly truncate (Fig. 254); gastral terga I and II in most specimens without black dorsal stripe. 18-24 mm ..... *A. touareg* ANDRÉ
- Asia. Free margin of clypeus more or less emarginate medially (Fig. 249); gastral terga I and II with black dorsal stripe ..... 48
48. Mesopleuron without appressed silvery setae or slightly pruinose; clypeus (Fig. 249). 16-19mm. Japan, Korea, China, Mongolia, India, Russian Far East (Vladivostok area) ..... *A. vagabunda* F. SMITH
- Mesopleuron with broad stripe of appressed silvery setae along mesopleural suture. 16-20 mm. Taiwan, India ..... *A. formosensis* TSUNEKI
49. Gastral apex with metallic shine; mesopleuron without distinct patch of appressed silvery setae; gastral terga I and II with black dorsal stripe. 15-20.5 mm. Europe, Turkey, Iran, Central Asia, Mongolia ..... *A. sabulosa* (LINNAEUS)
- Gastral apex black, without metallic shine; mesopleuron with or without patch of appressed silvery setae; gastral terga I and II with or without black dorsal stripe ..... 50
50. Episternal sulcus ending at level of scrobe; claws with small basal tooth (50×; Fig. 7, tooth evanescent in some specimens); apex of petiole closer to sternum II than to anterior end of tergum I; 14-18.5 mm. Central Europe (partly), Italy, France, Greece, Spain, Morocco, Cyprus, Syria, Jordan, Turkey, Armenia, Iran, Central Asia ..... *A. hungarica* MOCSÁRY
- Episternal sulcus extending to anteroventral margin of pleuron; claws without basal tooth; apex of petiole not closer to sternum II than to fore end of tergum I ..... 51
51. Petiole red; genitalia: Figs 434, 501, 557, 604. 13-15 mm. Israel, Egypt (Sinai Peninsula) ..... *A. mitlaensis* ALFIERI
- Petiole black ..... 52
52. Mesopleuron without distinct appressed silvery setae; scutum transversely rugose; terga I and II red, without black dorsal stripe. 13.5-17 mm. Tajikistan (Pamir), Kyrgyzstan, Uzbekistan ..... *A. altigena* GUSSAKOVSKIJ
- Mesopleuron with appressed silvery setae; terga I and II red, with black dorsal stripe ..... 53
53. Pronotal collar dorsally dull, coriaceous and sparsely punctate; scutum dull, coriaceous, punctate and transversely microstriate; propodeal enclosure all covered with erect setae. 13-19 mm. Spain, Portugal ..... *A. modesta* MOCSÁRY
- Pronotal collar dorsally smooth, shiny and irregularly punctate; scutum shiny and transversely striate; propodeal enclosure laterally glabrous. 13-18 mm. Israel, Jordan, Syria, Turkey, Afghanistan ..... *A. assimilis* KOHL



54. Mesothoracic venter anteriorly prominent, concave for reception of forecoxa, depression margined by carina which forms one projection on each side; pronotum nearly as long as basally broad (Figs 319-322)..... 55
- Mesothoracic venter anteriorly not prominent, without transverse carina; pronotum not elongate..... 59
55. Anterior margin of pronotal collar emarginate (Fig. 319); episternal sulcus ending at level of scrobe. 16-21 mm. East Turkey, South Russia, Iran, Kazakhstan, Turkmenistan, Mongolia..... *A. elongata* FISCHER DE WALDHEIM
- Anterior margin of pronotal collar not emarginate; episternal sulcus ending at level of scrobe or extending to anteroventral margin of pleuron ..... 56
56. Legs black; episternal sulcus extending to anteroventral margin of pleuron; clypeus, frons, pronotal lobe, band along mespleuroal suture and propodeum posterolaterally covered with appressed silvery setae, other areas pruinose. 14-18 mm. China, Mongolia ..... *A. sinensis* SICKMANN
- Legs red; head (except vertex), thorax and propodeum laterally covered with appressed silvery setae; episternal sulcus ending at level of scrobe or extending to anteroventral margin of pleuron..... 57
57. Propodeal enclosure medially coarsely reticulate and covered with sparse appressed silvery setae, laterally coarsely transversely ridged and glabrous; penis valve more trapezoid apically (Fig. 590); gonostyle narrowing toward apex (Fig. 417); episternal sulcus extending to anteroventral margin of pleuron, in some specimens covered with coarse rugae. 16-22.5 mm. Israel, Jordan, Iran, Turkmenistan, Uzbekistan, Mongolia ..... *A. occipitalis* F. MORAWITZ
- Propodeal enclosure longitudinally ridged and all covered with appressed silvery setae; penis valve evenly rounded apically (Fig. 588); gonostyle abruptly narrowed toward apex or not ..... 58
58. Pronotal collar in most specimens distinctly transversely rugose and sparsely covered with appressed silvery setae; gonostyle not abruptly narrowed apically (Fig. 418); penis valve laterally: Fig. 480. 13-18.5 mm. North Africa, Arabia, Ethiopia, Sudan, Syria, Israel, Central Asia, China, India ..... *A. gracillima* TASCHEBERG
- Pronotal collar slightly transversely rugose; head (except vertex), thorax, and propodeum covered with dense appressed silvery setae that obscure most of underlying sculpture; gonostyle more abruptly narrowed apically (Fig. 419). 15-17 mm. Iran, Kazakhstan, Turkmenistan, Uzbekistan..... *A. tekkensis* GUSSAKOVSKIJ
59. Gastral apex black, without metallic shine ..... 60
- Gastral apex with more or less distinct metallic shine ..... 62
60. Legs black. 14 mm. Iran ..... *A. persica* DOLLFUSS **nov.sp.**
- Legs partly red ..... 61
61. Pronotum and scutum with stiff black bristles (Fig. 164); median lobe of clypeus truncate, not unusually broad; gonostyle not abruptly narrowing toward apex (Fig. 421). Size larger: 20.5-23 mm. Saudi Arabia, Yemen, Oman..... *A. punti* GUICHARD
- Erect setae on head and pronotum silvery-white; median clypeal lobe unusually broad (Fig. 235). Size smaller: 14.5 mm. Israel ..... *A. schmideggeri* DOLLFUSS **nov.sp.**
62. Legs and thorax more or less red; gastral segments III, V and VII pruinose, in many specimens segment IV not pruinose; genitalia: Figs 422, 483, 542, 592. 18.5-21 mm. Jordan, Egypt, Israel, Iran, Iraq, Saudi Arabia, Yemen, Algeria, Tunisia, Morocco, Libya, Chad ..... *A. haimatosoma* KOHL

- Legs and thorax black; gastral segments not pruinose or in some specimens of *A. clavus* pruinose ..... 63
- 63. Wings brown; mesopleuron without appressed silvery setae; only tergum I red ventrally; forecoxa ventrally with apical tooth; mesopleuron and mesothoracic venter transversely punctato-rugose. 13-27 mm. Australia, Indonesia, Laos, China, Japan, India, Nepal. (In specimens from China see also *A. globifrontalis* LI & YANG 1995) ..... *A. clavus* (FABRICIUS)
- Wings hyaline; clypeus, frons and pronotal lobe covered with appressed silvery setae; tergum I and gastral segment II red, except for dorsal black stripe; scutum transversely striate, posterior half obliquely striate and punctate; mesopleuron and mesothoracic venter not transversely rugose. 19.5 mm. Russia, Turkey, Kazakhstan. (In specimens from Spain and Morocco see also *A. striata nadigi* ROTH 1932) ..... *A. striata* MOCSÁRY
- 64. Clypeus elongate and elevated, with one lateral projection on each side of free margin (Figs 251); hypostomal carina with blunt tooth near mandibular socket (Fig. 613/a). 14 mm. Pakistan ..... *A. abnormis* DOLLFUSS **nov.sp.**
- Clypeus differently shaped; hypostomal carina without tooth near mandibular socket ..... 65
- 65. Submarginal cell III trapeziform, not petiolate, in some specimens triangular (*A. terminata*), but then gastral apex with metallic shine ..... 66
- Submarginal cell III petiolate (Fig. 13), if triangular then gastral apex black, without metallic shine ..... 74
- 66. Pronotal collar transversely striate dorsally ..... 67
- Pronotal collar not striate dorsally ..... 71
- 67. Supra-antennal lamellate projection well developed; petiole all or partly red; gastral apex with metallic shine; pronotal collar in lateral view: Fig. 288. 15-19 mm. Algeria, Libya, Tunisia, Morocco ..... *A. electa* KOHL
- Supra-antennal lamellate projection absent; petiole black; gastral apex with or without metallic shine ..... 68
- 68. Episternal sulcus ending at level of scrobe; ventral clypeal margin broadly prominent, medially emarginate (Fig. 238); gastral apex without metallic shine. 17-19.5 mm. Northern Iran, China, Kazakhstan, Kyrgyzstan, Uzbekistan ..... *A. adelpha* KOHL
- Episternal sulcus extending to anteroventral margin of pleuron; clypeal margin anteriorly prominent and slightly narrowing; gastral apex with metallic shine ..... 69
- 69. Mesopleuron without appressed silvery setae, at most slightly pruinose. 21-22 mm. China, Kazakhstan ..... *A. terminata turkestanica* KOHL
- Mesopleuron with distinct patch of appressed silvery setae ..... 70
- 70. Pronotal collar and scutum finely transversely striate (Fig. 290); mesothoracic venter at most finely transversely striate. 13-18.5 mm. West- and Central Europe, Turkey, Algeria, Tunisia, Canary Islands, China, Mongolia, Kyrgyzstan, Kazakhstan. (In specimens from China see also *A. rubigege* LI & YANG 1990) ..... *A. terminata* F. SMITH
- Pronotal collar and scutum coarsely transversely striate (Fig. 289); mesothoracic venter distinctly transversely striate. 20 mm. Azerbaijan, Tajikistan ..... *A. gussakovskii* DOLLFUSS **nom.nov.**

71. Clypeus conspicuously gibbose basally; hindmargin of sternum VIII deeply emarginate; genitalia large (2 mm) and characteristically shaped (Figs 425, 491, 546, 597); episternal sulcus extending to anteroventral margin of pleuron. 17-20 mm. Turkey, south of European Russia (Volgograd area), Ukraine, Kazakhstan, Kyrgyzstan..... *A. sareptana* KOHL
- Clypeus not gibbose basally; hindmargin of sternum VIII not deeply emarginate; genitalia differently shaped; episternal sulcus ending at level of scrobe or extending to anteroventral margin of pleuron..... 72
72. Episternal sulcus ending at level of scrobe; gastral apex without metallic shine; clypeus ventrally broadly elongate, medially emarginate (Fig. 238). 17-19.5 mm. North Iran, Kazakhstan, Kyrgyzstan, Uzbekistan, China..... *A. adelpha* KOHL
- Episternal sulcus extending to anteroventral margin of pleuron; gastral apex with metallic shine; clypeus differently shaped..... 73
73. Clypeus, frons, pronotal lobe, mesopleuron and propodeum posterolaterally covered with sparse appressed silvery setae that do not conceal underlying sculpture; in many specimens pronotal collar and scutum transversely microstriate. 13-18 mm. Western and Central Europe, Turkey, Algeria, Tunisia, Canary Islands, Kazakhstan, Kyrgyzstan, China, Mongolia..... *A. terminata* F. SMITH
- Head (except vertex), thorax (except metapleuron) and propodeum (except enclosure) covered with dense appressed silvery setae that obscure most of underlying sculpture. 14.5-17 mm. Mongolia..... *A. tsunekii* MENKE
74. Supra-antennal lamellate projection well developed..... 75
- Supra-antennal lamellate projection absent ..... 76
75. Scutum distinctly transversely striate and coarsely punctate, on posterior half more obliquely striate and admedian line distinctly developed; pronotal collar sparsely coarsely punctate on dorsum, lobe transversely striate; propodeal enclosure coarsely slightly reticulate. 14-16.5 mm. Afghanistan (3800m), Kyrgyzstan, Tajikistan, Uzbekistan ..... *A. sarekandana* BALTHASAR
- Scutum dull, transversely microstriate; pronotal collar sparsely finely punctate; propodeal enclosure obliquely striate, dull. 13-16.5 mm. Kyrgyzstan, China, Mongolia. (In specimens from China see also *A. ganquana* YANG & LI 1989, *A. obliquestriole* YANG & LI 1989 and *A. pachythoracalis* YANG & LI 1989)..... *A. deserticola* TSUNEKI
76. Posterior margin of forecoxa with apical tooth. 12-17 mm. China, Mongolia..... *A. vetuberosa* LI & YANG
- Posterior margin of forecoxa without tooth ..... 77
77. Gaster dorsally black, at least black stripe on terga I and II ..... 78
- At least terga I and II all red ..... 79
78. Scutum dull and transversely microstriate; propodeal enclosure obliquely striate, interspaces micropunctate; mesopleuron in most specimens not covered with appressed silvery setae. 12.5-18 mm. Europe, Turkey, Kazakhstan, Mongolia, China. (In specimens from China see also *A. borealis* LI & YANG 1990)..... *A. pubescens* CURTIS
- Scutum shiny and distinctly transversely striate; propodeal enclosure obliquely striate, interspace shiny; mesopleuron covered with distinct appressed silvery setae. 15 mm. East Afghanistan (Nuristan 2700m), West Pakistan (Chitra 3550m)..... *A. afghanica* BALTHASAR
79. Gonostyle laterally with long bristle-like setae dorsally and ventrally (Fig. 428). 14-17 mm. Mongolia, Tajikistan, Kazakhstan, Kyrgyzstan, Armenia, Central Turkey..... *A. mongolensis* TSUNEKI

- Gonostyle differently shaped ..... 80
- 80. Mesopleuron and propodeum not covered with appressed silvery setae; scutum shiny, distinctly transversely striate and punctate; erect setae black. 14.5-18.5 mm. Kyrgyzstan, Kazakhstan ..... *A. rauschi* DOLLFUSS **nov.sp.**
- Mesopleuron and propodeum posterolaterally covered with distinct appressed silvery setae; scutum shiny or dull; erect setae black or silvery-white ..... 81
- 81. Penis valve in apical view slender, sides nearly parallel (Fig. 600); scutum in most specimens shiny and distinctly transversely striate. 14-19 mm. Azerbaijan, Kazakhstan, Turkmenistan. (In specimens from China see also *A. heterocephala* LI & XUE 1998) ..... *A. separanda* F. MORAWITZ
- Penis valve in apical view more rounded (Figs 601, 602); scutum dull and transversely microstriate or shiny and distinctly transversely striate ..... 82
- 82. Scutum shiny and distinctly transversely striate. 15.5-17 mm. Turkey ..... *A. haladai* DOLLFUSS **nov.sp.**
- Scutum dull and transversely microstriate ..... 83
- 83. Pronotal collar and scutum covered with fine appressed silvery setae; scutum finely striate and rugose; pronotal collar in lateral view: Fig. 298. 13.5-15.5 mm. Mongolia ..... *A. asiatica* TSUNEKI
- Pronotal collar and scutum without appressed silvery setae; scutum microstriate; pronotal collar in lateral view: Fig. 299. 12-14.5 mm. Europe, Central- and East Asia ..... *A. campestris* LATREILLE
- 84. Episternal sulcus extending to anteroventral margin of pleuron; propodeal enclosure glabrous; pronotal collar and scutum finely transversely striate; mesopleuron with broad patch of appressed silvery setae; gonostyle in lateral view: Fig. 413; penis valve in lateral view: Fig. 500. 18 mm. Israel, Jordan, Egypt (Sinai Peninsula) ..... *A. honorei* ALFIERI
- Episternal sulcus ending at level of scrobe; propodeal enclosure medially irregularly rugose with short erect setae, laterally transversely rugose, glabrous; mesopleuron without appressed silvery setae; pronotal collar and scutum coarsely transversely rugose; gonostyle in lateral view: Fig. 423; penis valve: Fig. 484. 13-27 mm. Australia, Indonesia, China, Laos, Japan, India, Nepal ..... *A. clavus* (FABRICIUS), black form
- 85. Legs black; propodeal enclosure glabrous; mesothoracic venter not prominent anteriorly, at most with small carina; posterior margin of forecoxa without apical spine. 12-17 mm. Jordan, Israel, Algeria, Tunisia, Morocco, Syria, Turkey ..... *A. barbara* (LEPELETIER)
- Legs partly red; propodeal enclosure medially with sparse appressed silvery setae, laterally glabrous; mesothoracic venter prominent anteriorly, with transverse carina that forms a projection on each side; posterior margin of forecoxa with apical spine (difficult to see). 12-16 mm. Israel, Egypt (Sinai Peninsula), Iran, Jordan, Syria, Algeria, Morocco. (some specimens of *A. gracillima* and *A. heydeni* in which 1 r-m crossvein is lost run to here) ..... *A. theryi* (GRIBODO)

### Species descriptions

***Ammophila abnormis* DOLLFUSS nov.sp. (Figs 251, 257, 369, 439, 506, 611, 613/a)**

R e c o r d s : Holotype: ♂, Pakistan: Baluchistan: Gwal, IV.1931, leg. D. Harrison (BMNH).

**Name of derivation:** *abnormis*, Latin adjective meaning abnormal, with reference to the shape of the clypeal free margin.

**Recognition:** The male of *Ammophila abnormis* is characterized by the presence of three submarginal cells, the gastral apex without metallic shine and the absence of the supra antennal-lamellate projection. In addition, the propodeal enclosure is glabrous, the episternal sulcus extending to the anteroventral margin of the pleuron and the clypeus characteristically shaped (Fig. 251). *A. electa* differs from *A. abnormis* in having the gastral apex with a metallic shine, the supra-antennal lamellate projection well developed, and a differently shaped clypeus. *A. adelpha* differs from *A. abnormis* in having an episternal sulcus ending at the level of the scrobe and differently shaped clypeus and genitalia. *A. terminata* differs from *A. abnormis* in having the gastral apex with a metallic shine and differently shaped clypeus and genitalia.

**Description:** ♂: 14 mm. Black, with the following red: petiole, tergum I, gastral segments II and III and sterna IV-VII; terga V-VII black without metallic shine; wings hyaline. Clypeus, frons, pronotal lobe, mesopleuron and propodeum posterolaterally covered with appressed silvery setae; hind- and midlegs pruinose, erect setae silvery-white. Clypeus elongate, elevated in lateral view (Fig. 369), with one lateral projection each side of free margin (Fig. 251), projections covered with long, erect setae. Hypostomal carina with blunt tooth near mandibular socket (Fig. 613/a). Frons and vertex dull, supra-antennal lamellate projection absent; mesothoracic venter anteriorly not prominent, episternal sulcus extending to anteroventral margin of pleuron; pronotal collar transversely microstriate dorsally, laterally more distinctly striate; scutum anteriorly dull and finely transversely striate, posteriorly shiny and distinctly obliquely striate; scutellum longitudinally striate, metanotum irregularly sculptured. Propodeal enclosure glabrous, medially irregularly rugose, laterally transversely striate. Mesopleuron covered with appressed silvery setae that obscure underlying sculpture, metapleuron longitudinally striate, propodeum obliquely striate laterally. Arolia large, claws without basal tooth. Pronotal lobe laterally: Fig. 257. Gonostyle with few short spines preapically (Fig. 439), penis valve without preapical spines (Fig. 506). Volsella characterized by leaf-like broadened cuspis (Fig. 611). Flagellomere I: II=2.0; length of petiole = hindtarsomeres I+II+0.25×III.

♀ unknown.

**Geographical distribution:** Pakistan (Baluchistan).

### ***Ammophila adelpha* KOHL (Figs 74, 99, 169, 238, 291, 326, 359, 410, 543, 595)**

As *Ammophila striata*: KOHL 1884: 382 (description, China), corrected to *Ammophila adelpha* by KOHL 1901: 152.

*Ammophila adelpha* KOHL 1901: 152, ♀. **Lectotype:** ♀, China: Sinkiang (as Dzhungaria): no specific locality (NHMW), examined; **present designation.**

**Material examined:** **Lectotype** (♀, NHMW); **Kazakhstan:** Kapachagai 43.9°N 76.8°E 60 km N Alma-Ata (1♀ OÖLM). **Kyrgyzstan:** Sandelashsky Mts. Kuzu-Terek (1♀ OÖLM), Talasskaya District Kara-Bura 42°40'N 72°10'E (1♀ OÖLM), Fergan Khmaza-Abad (1♂ OÖLM), Kadamzoy (1♂ OÖLM). **Uzbekistan:** Fergana env. (30 km) Kadamzay (1♂ OÖLM).

**Recognition:** *Ammophila adelpha* has a black gastral apex without a metallic shine, the episternal sulcus ending at the level of the scrobe, the propodeal enclosure-glabrous and the claws without basal tooth. The female shares with *A. sareptana*, *A.*

*terminata* and *A. tsunekii* the glabrous propodeal enclosure, but differs in having an episternal sulcus ending at the level of the scrobe and a characteristically shaped clypeus (Fig. 74). The male shares with *A. terminata*, *A. gussakovskii* and *A. tsunekii* the glabrous propodeal enclosure, but differs in having an episternal sulcus ending at the level of the scrobe and a characteristically shaped clypeus (Fig. 238). The male of *A. sareptana* differs from *A. adelpha* in having an episternal sulcus extending to the anteroventral margin of the pleuron and a characteristically shaped penis valve (Fig. 491).

**Description:** ♀: 19-20 mm. Black except tergum I (except basally), gastral segment II (III) red; gastral apex without metallic shine. Upper half of clypeus, lower half of frons, pronotal lobe, small band on mesopleural suture, patch on lateral surface of propodeum, and coxae covered with appressed silvery setae. Erect setae on head brown, on thorax and propodeum laterally silvery-white. Clypeus characteristically shaped: disk slightly concave on ventral half, slightly convex on dorsal half (Fig. 99); free margin produced, narrowed, with distinct small emargination medially (Fig. 74). Pronotal collar smooth and shiny dorsally, or in some specimens transversely striate, anteriorly and laterally in all specimens transversely striate. Scutum smooth and shiny on median one-third, sparsely punctate, with broad admedian line, lateral third distinctly transversely striate; scutellum and metanotum longitudinally rugose. Propodeal enclosure shiny, coarsely, obliquely striate, glabrous; mesothoracic venter transversely striate, anteriorly not prominent, arolia small but distinct. Pronotal collar laterally: Fig. 169. Flagellomere I: II=(1.6)1.9-2; length of petiole = hindtarsomeres I+0.5×II.

♂ (hitherto unknown): 17-19.5 mm. Black except tergum I (except basally), gastral segment II (III) red; gastral apex without metallic shine. Clypeus, frons, pronotal lobe, patch on mesopleuron covered with appressed silvery setae; erect setae silvery-white. Clypeus broadly elongate, medially emarginate (Figs 238, 359); pronotal collar transversely striate dorsally (Fig. 326) or in some specimens shiny and punctate, laterally in all specimens distinctly transversely striate. Scutum shiny, transversely striate, punctate, with well defined admedian line; scutellum and metanotum longitudinally striate. Propodeal enclosure shiny, obliquely striate, glabrous, lateral surface of propodeum obliquely rugose. Mesopleuron punctato-rugose, not prominent anteroventrally; arolia large. Pronotal collar laterally: Fig. 291; gonostyle laterally: Fig. 410; penis valve laterally: Fig. 487, ventrally: Fig. 543, apically: Fig. 595. Flagellomere I: II=1.5-1.6; length of petiole = hindtarsomeres I+II or I+0.75×II.

**Geographical distribution:** North Iran, Kazakhstan, Kyrgyzstan, Uzbekistan, China.

### ***Ammophila afghanica* BALTHASAR (Figs 79, 101, 250, 305, 437, 498)**

*Ammophila afghanica* BALTHASAR 1957: 190, ♀ only. **Holotype:** ♀, Afghanistan: Badakhshan: Sarekanda (NMPC), not examined. **Paratype:** ♀, Afghanistan: Nuristan: Akhmede Dewane (NMPC), examined.

**Material examined:** **Paratype** (♀ NMPC). **Paratype:** W-Pakistan: Chitral: Tirich Valley, c.3550m, 5.-11. VIII.1984, leg. Budenberg (1 ♂ BMNH), 2 ♀ from the same locality (BMNH).

**Note:** The true male of *Ammophila afghanica* was hitherto unknown. The male described by BALTHASAR 1957: 190 as *A. afghanica* is actually this of *A. sarekandana* BALTHASAR 1957: 192.

**Recognition:** *Ammophila afghanica* has the gastral apex black, without a



metallic shine, a submarginal cell III petiolate, the propodeal enclosure glabrous and the supra-antennal lamellate projection absent. Additionally, the mesothoracic venter is not prominent anteriorly, the episternal sulcus is extending to the anteroventral margin of the pleuron, the arolia are well defined and the claws have no basal tooth. In addition, the female has a petiole with long, erect setae ventrally. The female is similar to *A. pubescens* but differs in having silvery-white erect setae on the head, a scutum shiny and distinctly transversely striate and the clypeus and the frons covered with distinctly appressed silvery setae. The female of *A. campestris* differs from *A. afghanica* in having a petiole without erect setae ventrally, the clypeus in most specimens without appressed silvery setae and the propodeal enclosure transversely striate and shiny. The male of *A. afghanica* differs from *A. pubescens* in having a shiny scutum distinctly transversely striate and the mesopleuron covered with dense, appressed silvery setae (*A. pubescens* has a dull scutum and the mesopleuron is at most pruinose). The males of *A. sarekandana* and *A. deserticola* differ from *A. afghanica* in having the supra-antennal lamellate projection well developed.

**Description:** Submarginal cell III petiolate, propodeal enclosure glabrous, supra-antennal lamellate projection absent. Mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, gastral apex black, without metallic shine. Arolia well defined, claws without basal tooth.

♀: 16-17 mm. Black except tergum I, gastral segments II, III and one-third of IV laterally red. Clypeus, frons, pronotal lobe, mesopleuron, and propodeum posterolaterally covered with appressed silvery setae; erect setae silvery-white. Clypeus slightly elongate, with disk distinctly convex. Pronotal collar shiny, sparsely punctate dorsally; scutum finely transversely striate on anterior half, with arcuate striae and punctate on posterior half; scutellum longitudinally ridged, punctate. Mesopleuron punctate, metapleuron longitudinally striate, propodeal enclosure obliquely striate, micropunctate between the striae, glabrous. Petiole with long erect setae ventrally. Flagellomere I: II=1.8; length of petiole = hindtarsomeres I+0.5×II to I+II.

♂: 15 mm. Black except tergum I, gastral segments II and III (all with dorsal black stripe), and sterna IV and V basally red. Clypeus, frons, pronotal lobe, mesopleuron, and propodeum posterolaterally covered with dense, appressed silvery setae; propodeum laterally and legs pruinose; erect setae long, silvery-white. Clypeus elongate (Fig. 250), disk nearly flat. Pronotal collar shiny, finely punctate dorsally, finely transversely striate laterally. Scutum shiny, distinctly transversely striate and punctate on anterior half, obliquely striate on posterior half, admedian line distinct. Mesopleuron, metapleuron, and propodeum laterally punctato-rugose. Propodeal enclosure glabrous, obliquely striate, shiny. Pronotal collar laterally: Fig. 305. Gonostyle laterally: Fig. 437; penis valve laterally: Fig. 498, ventrally: Fig. 555. Flagellomere I: II=1.7; length of petiole = hindtarsomeres I+II.

**Geographical distribution:** East Afghanistan (Nuristan 2700 m), West Pakistan (Chitral 3550 m).

### ***Ammophila albotomentosa* MORICE (Figs 26, 225, 339, 385, 456)**

*Ammophila albotomentosa* MORICE 1900: 69, ♀, ♂. **Holotype:** ♂, Algeria: Biskra (OXUM), examined.

**Material examined:** **Holotype** (♂ OXUM); Tunisia: Gasfa (1♀, 2♂♂ OÖLM), Oasis 15 km W Nefta 33°50'N 07°43'E (1♀, 1♂ coll. Schmid-Egger).



**R e c o g n i t i o n :** *Ammophila albotomentosa* has no transverse rugae on the pronotal collar, the mesothoracic venter is not prominent anteriorly, the episternal sulcus is extending to the anteroventral margin of the pleuron. This species is characterized by the head (except vertex), the thorax and the propodeum covered with appressed silvery setae that obscure most of the underlying sculpture. The vertex laterally of the hindocelli is smooth and glabrous, additionally, the erect setae are whitish and the gastral apex is red without metallic shine. The similar female of *A. hemilauta* differs from *A. albotomentosa* in having no dense appressed silvery setae on the metapleuron and the gastral apex with a slight metallic shine. The male of *A. hemilauta* differs from *A. albotomentosa* in having the clypeus more elongate (Fig. 205) and the clypeal disk concave on ventral half in lateral view (Fig. 340) and distinctly differently shaped genitalia: penis valve laterally: Fig. 460, and gonostyle laterally: Fig. 398.

**D e s c r i p t i o n :** Black, with following yellowish-brown: mandible (except apex), clypeus along free margin, scape, tegula, fore- and midlegs (except coxa), hindlegs partly, tergum I and gastral segment II (except for a black dorsal stripe) and remaining areas of the gaster (except of black spot on terga V and VI in female). Head (except vertex), thorax and propodeum covered with dense appressed silvery setae that obscure most of underlying sculpture. Supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron. Arolia distinctly developed, claws without basal tooth.

♀: 18-22 mm. Clypeus elongate with small emargination in middle of lobe (Fig. 26), disk convex. Scutum punctate with slight transverse rugae, scutellum longitudinally striate. Propodeal enclosure irregularly rugose, covered with appressed silvery setae and erect white setae. Flagellomere I: II=1.8-2.1; length of petiole = hindtarsomeres I+II or I+II+0.5×III.

♂: 16.5-17.5 mm. Clypeus elongate and medially emarginate (Fig. 225), disk in lateral view straight, basal half with distinct swelling (Fig. 339). Genitalia characteristically shaped: penis valve laterally: Fig. 456, gonostyle laterally: Fig. 385. Flagellomere I: II=1.6-2.0; length of petiole = hindtarsomeres I+II or I+II+0.5×III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Algeria, Tunisia, Spain.

***Ammophila altigena* GUSSAKOVSKIJ (Figs 229, 281, 352, 389, 475, 533)**

*Ammophila altigena* GUSSAKOVSKIJ 1930a: 73, ♂. Holotype: ♂, Tajikistan: Sary-kol Range on Chinese border of Pamir (not in ZIN, Belokobylskiy 2010 in lit., lost?)

**M a t e r i a l e x a m i n e d :** Kyrgyzstan: Kirghizky Mt. R. Uzun-Bulag Ala-Archa riv. (1♂ OÖLM). Uzbekistan: Papngan 20 km NW Kokand 41.2°N 70.6°E (1♂ OÖLM).

**R e c o g n i t i o n :** The gastral apex has no metallic shine. Only the clypeus and the frons are covered with appressed silvery setae, the erect setae are brown on the head, those on the thorax and the propodeum are whitish. Additionally, the supra-antennal lamellate projection is absent, the episternal sulcus is extending to the anteroventral margin of the pleuron. The male of *A. altigena* is similar to *A. modesta* and *A. assimilis* but differs in having no appressed silvery setae on the mesopleuron. The male of *A. sabulosa* differs from *A. altigena* in having the gastral apex with metallic shine and gastral terga I and II with a black dorsal stripe.

**D e s c r i p t i o n :** ♂: 17-17.5 mm. Black except tergum I, gastral segment II and

basal half of III red. Clypeus slightly elongate, nearly truncate (Fig. 229), disk nearly flat (Fig. 352). Pronotal collar shiny and punctate, scutum densely punctate and irregularly transversely ridged. Scutellum punctate and longitudinally ridged, mesopleuron, metapleuron, and propodeum laterally punctato-rugose. Propodeal enclosure coarsely irregularly rugose, all covered with erect setae. Arolia large and claws without basal tooth. Pronotal collar laterally: Fig. 281; gonostyle laterally: Fig. 389; penis valve laterally: Fig. 475, ventrally: Fig. 533. Flagellomere I: II=1.5; length of petiole = hindtarsomeres I+0.75×II.

♀ unknown.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Kyrgyzstan, Tajikistan (Pamir), Uzbekistan.

***Ammophila antropovi* DOLLFUSS nov.sp. (Figs 204, 270, 309, 338, 397, 463, 579)**

**R e c o r d s :** Holotype: ♂: Tunisia-SE: 25 km S Zarzis, 13. IV.2001, leg. M. Halada (OÖLM).

**N a m e o f d e r i v a t i o n :** In honor of the outstanding specialist of Sphecidae, Dr. Alexander V. Antropov, Moscow, Russia.

**R e c o g n i t i o n :** The male of *Ammophila antropovi* is characterized by extremely large genitalia (3 × 2 mm), by the shape of the penis valve (Fig. 463), by the shape of the clypeus (Fig. 204), by the labrum with a preapical spine and the mandible with a basal tooth. It is similar to *A. pseudonasuta* but differs in having a clypeal free margin narrowly emarginate (Fig. 204), the penis valve ending in a shorter spine (Fig. 463), the gonostyle apically not broadened and not concave (Fig. 397) and the labrum with a preapical spine.

**D e s c r i p t i o n :** ♂: 21.5 mm. Gastral apex without metallic shine. Black, following parts reddish-brown: mandible (except apex), clypeus next to free margin, ventral surface of scape, tegula, fore- and midlegs, hindfemur and hindtibia (except dorsal face), petiole venter, tergum I (dorsally black), gastral segments III-IV, segments V-VI (dorsally black). Clypeus, frons (nearly up to anterior ocellus), pronotal collar, pronotal lobe, scutum, all of mesopleuron, metapleuron (not so dense), propodeum (including propodeal enclosure) and coxa covered with appressed silvery setae. Head, thorax and propodeum (including propodeal enclosure) covered with whitish erect setae. Mandible inner margin with one preapical and one distinct basal tooth; labrum with preapical spine. Supra-antennal lamellate projection absent and episternal sulcus extending to anteroventral margin of pleuron. Clypeus elongate and narrowly emarginate (Fig. 204), ventral half of clypeal disk slightly concave, dorsal half convex (Fig. 338). Vertex punctate, not covered with appressed silvery setae, pronotal collar dull, sparsely punctate, without transverse striae. Scutum punctate, some punctures confluent, scutellum longitudinally ridged and punctate; metanotum punctate. Propodeal enclosure coarsely punctato-rugose, slightly covered with appressed silvery setae and erect white setae. Pronotal collar laterally: Fig. 270, dorsally: Fig. 309. Gonostyle laterally: Fig. 397; penis valve laterally: Fig. 463, apically: Fig. 579. Flagellomere I: II=1.6, length of petiole = hindtarsomeres I+II.

♀ unknown.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Tunisia.

***Ammophila asiatica* TSUNEKI (Figs 187, 243, 298, 329, 431, 495, 552)**

*Ammophila asiatica* TSUNEKI 1971: 166, ♂, ♀. Holotype: ♂, Mongolia: Uvs Aymag: Hödlon gol (TMB), examined.

**Material examined:** Holotype (♂ TMB); Mongolia: 16 km NW Bayankhongor 46°13'N 100°30.5'E 2100m (1♀, 2♂♂ OÖLM), 86 km NW Bayankhongor 46°50'N 100°04'E 2070m (1♀, 3♂♂ OÖLM), 56 km NW Bayankhongor 46°33'N 100°12'E 2220m (1♀ OÖLM), Övörkhangaй 12 km E Arvaykheer 46°22'N 102°49'E 1770m (4♀♀, 1♂ OÖLM), Övörkhangaй 137 km NE Arvaykheer 47°20'N 103°40.5'E 1250m (7♀♀ OÖLM), 210 km SSE Baruun-Urt (1♂ OÖLM), 200 km SSE Baruun-Urt Moltsoy Els 1250m (2♂♂ OÖLM), Altayn Mts. Gichigniy Nuruu Bulgan env. (1♂ OÖLM), 100 km E Ulaanbaatar 20 km NE Terelts Tuul riv. (1♂ OÖLM), 170 km W Ulaanbaatar dunes 1070m (1♀ OÖLM), lake Terkhiyn Tsagan 47°11'N 99°43'E 2100m (1♀ OÖLM), 100 km W Mandalgovi Sangiyn Dalay (3♀♀ OÖLM), 100 km NE Ondorkhaan Kherlen riv. 970m (1♀ OÖLM), 20 km SE Chor 1400m (1♀ OÖLM).

**Recognition:** *Ammophila asiatica* has a submarginal cell III petiolate, the gastral apex black without metallic shine, the propodeal enclosure glabrous and the supra-antennal lamellate projection absent. The female of *A. campestris* is similar but differs in having no dense appressed silvery setae on the clypeus and the frons and only a small patch on the mesopleuron along the mesopleural suture (*A. asiatica* has dense appressed silvery setae on the clypeus, the frons and a large patch on the mesopleuron). The female of *A. pubescens* differs from *A. asiatica* in having distinct erect setae on the petiole ventrally and black erect setae on the head and the clypeus, additionally, the frons is not covered with appressed silvery setae (in some specimens with traces of them). The male of *A. asiatica* is similar to *A. campestris* but differs in the shape of pronotal collar in lateral view (Fig. 298) and in having more developed appressed silvery setae on the clypeus, the frons, the mesopleuron, the pronotal collar and the scutum. The male of *A. asiatica* differs from *A. pubescens* in having no black stripe on terga I and II, in the shape of pronotal collar in lateral view (Fig. 298) and in having white erect setae on the head.

**Description:** Submarginal cell III petiolate, propodeal enclosure glabrous, supra-antennal lamellate projection absent and mesothoracic venter not prominent anteriorly. Episternal sulcus extending to anteroventral margin of pleuron, arolia well defined, claws without basal tooth and gastral apex without metallic shine.

♀: 14-15 mm. Black except tergum I, gastral segments II and III red. Clypeus, frons, pronotal lobe, large patch on mesopleuron, propodeum posterolaterally and coxa covered with appressed silvery setae, remaining areas of head, thorax, propodeum and legs pruinose; erect setae whitish. Clypeus slightly elongate, disk convex. Pronotal collar in lateral view: Fig. 187, anterior part and lateral lobes of collar transversely microstriate. Scutum dull, punctate and transversely microstriate on anterior half, obliquely microstriate or finely striate on posterior half; scutellum longitudinally striate. Propodeal enclosure obliquely striate and dull, mesopleuron dull and sparsely punctate. Metapleuron and propodeum laterally dull, irregularly punctato-rugose. Flagellomere I: II=1.7-2.0; length of petiole = hindtarsomeres I+0.5xII.

♂: 13.5-15.5 mm. Black except tergum I and gastral segments II and III red. Clypeus, frons (nearly up to fore ocellus), pronotal lobe, mesopleuron (nearly all), and propodeum posterolaterally covered with appressed silvery setae. Pronotal collar, scutum, and coxae covered with fine, short appressed silvery setae; erect setae whitish. Clypeus elongate, truncate (Fig. 243), disk slightly convex. Pronotal collar thick and rounded (Fig. 329), anterior part more or less obliquely shaped in lateral view (Fig. 298). Scutum sparsely punctate and finely transversely striate anteriorly, obliquely striate posteriorly; scutellum

longitudinally ridged. Propodeal enclosure obliquely striate and more or less dull, mesopleuron dull and sparsely punctate, metapleuron and propodeum laterally obliquely punctato-rugose. Gonostyle laterally: Fig. 431; penis valve laterally: Fig. 495, ventrally: Fig. 552. Flagellomere I:  $II=1.5-1.7$ ; length of petiole = hindtarsomeres I+II or  $I+II+0.3 \times III$ .

**G e o g r a p h i c a l d i s t r i b u t i o n :** Mongolia.

***Ammophila assimilis* KOHL (Figs 57, 127, 152, 231, 415, 477, 535)**

*Ammophila assimilis* KOHL 1901: 150, ♀, ♂. Lectotype: ♀: Syria: no specific locality (NHMW), examined, **present designation**.

**M a t e r i a l e x a m i n e d :** Lectotype (♀ HMW); (1♀ NHMW), (66♀ ♀, 22♂ ♂ OÖLM), (1♂ coll. Schmid-Egger).

**R e c o g n i t i o n :** *Ammophila assimilis* has the gastral apex black without a metallic shine, the petiole is black, the propodeal enclosure with erect setae and the supra-antennal lamellate projection is absent. The female is similar to *A. modesta* but differs in having the pronotal collar smooth and shiny and the scutum shiny, coarsely punctate and transversely striate laterally (*A. modesta* has the pronotal collar and scutum dull and coriaceous). It differs from *A. sabulosa* in having the gastral apex black without metallic shine, a pronotal collar smooth and shiny and the scutum shiny with distinct transverse striae laterally (*A. sabulosa* has the pronotal collar and the scutum dull). The female of the Indian species *A. brevipennis* differs from *A. assilimis* in having a red petiole, black erect setae and an arcuate free margin of the clypeus (Fig. 56). Both sexes of *A. mitlaensis* differ from *A. assimilis* in having a red petiole. The male of *A. modesta* is similar to *A. assimilis* but differs in having the pronotal collar dull, coriaceous and sparsely punctate, the scutum dull coriaceous and transversely microstriate (*A. assimilis* has the pronotal collar and the scutum shiny). The male of *A. sabulosa* differs from *A. assimilis* in having a gastral apex with blue metallic shine and the mesopleuron without a distinct patch of appressed silvery setae. The male of *A. sareptana* differs from *A. assimilis* in having a characteristically shaped gonostyle (Fig. 425) and penis valve (Fig. 491) and a glabrous propodeal enclosure.

**D e s c r i p t i o n :** Gastral apex black, without metallic shine, supra-antennal lamellate projection absent and mesothoracic venter not prominent anteriorly. Episternal sulcus extending to anteroventral margin of pleuron, arolia developed and claws without basal tooth.

♀: 16.5-20 mm. Black, with following red: tergum I, gastral segment II and basal half of III, in some specimens these dorsally black. Pronotal lobe and propodeum posterolaterally covered with appressed silvery setae. Propodeal enclosure irregularly rugose and covered with erect setae along midline, more regularly transversely rugose and glabrous laterally. Erect setae whitish (except brownish on head). Clypeus slightly elongate, with distinct median lobe (Fig. 57), disk convex. Pronotal collar smooth, shiny and sparsely punctate dorsally (Fig. 127), lateral lobes transversely striate (Fig. 152). Scutum shiny, coarsely punctate and laterally transversely striate; scutellum smooth, shiny and sparsely punctate on anterior half, longitudinally striate on posterior half. Mesopleuron, metapleuron and propodeum laterally punctato-rugose. Flagellomere I:  $II=1.6-1.8$ ; length of the petiole = hindtarsomeres  $I+0.5 \times II$  to  $I+II$ .

**Variation:** In many females the clypeus, the frons, the pronotal lobe, a patch along

mesopleural suture on mesopleuron and the propodeum posterolaterally are covered with appressed silvery setae.

♂: 13-18 mm. Black, with following red: tergum I, gastral segments II and basal half of III (all dorsally with black stripe). Appressed silvery setae forming spots on clypeus, frons, pronotal lobe, mesopleuron along mesopleural suture (in some specimens reduced) and propodeum posterolaterally; erect setae whitish. Pronotal collar smooth, shiny, irregularly punctate dorsally, lateral lobes slightly transversely striate. Scutum shiny, coarsely punctate and transversely striate. In most specimens anterior half of scutellum smooth, shiny and coarsely punctate, posterior half longitudinally striate. Clypeus: Fig. 231; gonostyle laterally: Fig. 415; penis valve laterally: Fig. 477, ventrally: Fig. 535. Flagellomere I: II=1.3-1.6; length of petiole = hindtarsomeres I+0.75×II to I+II.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Afghanistan, Turkey, Israel, Jordan, Syria.

***Ammophila atlantica* ROTH (Figs 207, 272, 311, 343, 386, 465, 524, 584)**

*Ammophila atlantica* ROTH 1928: 199, ♀, ♂. **Lectotype:** ♂, Morocco: Tanger (MNHN), examined, **present designation.** *Ammophila atlantica* was described as a subspecies of *A. nasuta*, but raised to the full species status by BYTINSKI-SALZ in DE BEAUMONT & BYTINSKI-SALZ 1955: 38.

**M a t e r i a l e x a m i n e d :** 2♀♀, 12♂♂ (OÖLM), 2♀♀, 7♂♂ (MNHN), 4♀♀, 3♂♂ (coll. Schmid-Egger).

**R e c o g n i t i o n :** *Ammophila atlantica* has the gastral apex with a blue metallic shine, pronotal collar and petiole red and the pronotal collar subrectangularly rounded. The female of the European species *A. laevicollis* differs from *A. atlantica* in having the pronotal collar and the petiole black. I cannot find reliable separation characters for the females of *A. atlantica* and *A. nasuta*. The male of *A. quadraticollis* is similar to *A. atlantica* but differs in having a more rectangular pronotal collar (Figs 271, 310), sternum VIII not emarginated, but roof-like, the gonostyle (Fig. 400) the penis valve characteristically shaped (Figs 464, 523). The male of *A. nasuta* is similar to *A. atlantica* but differs in having a distinct tubercle on the clypeal apex (Figs 200, 335). The male of *A. laevicollis* is similar to *A. atlantica* but differs in having a tubercle on the clypeal apex (Figs 201, 336), the inner margin of the mandible with a long basal tooth, the labrum with a distinct apical tooth and a black pronotal collar. The male of *A. albotomentosa* differs from *A. atlantica* in having a gastral apex without metallic shine, the thorax all covered with dense appressed silvery setae that obscure the underlying sculpture and characteristically shaped gonostyle (Fig. 385) and penis valve (Fig. 456). The male of *A. hemilauta* differs from *A. atlantica* in having a gastral apex without metallic shine, the inner margin of the mandible with two subapical teeth, the labrum with an apical tooth and characteristically shaped gonostyle (Fig. 398) and penis valve (Fig. 460). The males of *A. djaouak*, *A. pseudonasuta* and *A. antropovi* differ distinctly from *A. atlantica* in the shape of the genitalia and sternum VIII.

**D e s c r i p t i o n :** Mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia distinctly developed and claws without basal tooth. Black, with following red: mandible (except apex), scape, pronotal collar including pronotal lobe, tegula, fore- and midlegs, hindleg (except trochanter and apical half of tibia), petiole, tergum I (except basally) and gastral segments III and IV (partly darkened in some specimens).

♀: 20.5-21 mm. Basal half of clypeus, frons, pronotal lobe posteriorly, mesopleuron and propodeum laterally covered with appressed silvery setae; erect setae whitish. Clypeus distinctly elongate and rounded, disk convex. Pronotal collar subrectangularly rounded (as in *A. nasuta* Fig. 110, not as distinctly as in *A. quadraticollis* Fig. 117), shiny and sparsely, finely punctate, propleuron transversely striate. Scutum transversely punctato-rugose, scutellum longitudinally striate and coarsely punctate. Propodeal enclosure reticularly rugose and covered with whitish erect setae. Mesopleuron punctato-rugose, covered with appressed silvery setae, mesothoracic venter and metapleuron not covered with appressed silvery setae. Flagellomere I: II=1.8-2.0; length of petiole = hindtarsomeres I+0.75×II to I+II+0.25×III.

♂: 18-20.5 mm. Clypeus, frons, pronotal lobe posteriorly, mesopleuron, propodeum laterally and hindcoxa dorsally covered with appressed silvery setae. Inner margin of mandible with one subapical tooth and labrum without tooth. Clypeus distinctly elongate and emarginated apically (Fig. 207), disk concave on ventral half, convex on dorsal half (Fig. 343). Pronotal collar slightly subrectangularly rounded (Figs 272, 311), but not as distinctly as in *A. quadraticollis* (Figs 271, 310), shiny and sparsely punctate. Scutum coarsely punctate and transversely rugose, scutellum longitudinally punctato-rugose. Propodeal enclosure coarsely punctato-rugose and covered with white erect setae. Mesopleuron punctato-rugose, metapleuron punctato-rugose but not covered with appressed silvery setae. Sternum VIII deeply emarginated and genitalia characteristically shaped: gonostyle laterally: Fig. 386; penis valve laterally: Fig. 465, ventrally: Fig. 524, apically: Fig. 584. Flagellomere I: II=1.9-2.0; length of petiole = hindtarsomeres I+II.

**Geographical distribution:** Western and north-western coast of Morocco.

***Ammophila barbara* (LEPELETIER DE SAINT FARGEAU) (Figs 83, 105, 136, 190, 245, 300, 331, 364, 433, 499, 554, 603)**

*Coloptera barbara* LEPELETIER DE SAINT FARGEAU 1845: 387, ♂. **Syntypes:** Algeria: Oran (originally Lepeletier de Saint Fargeau coll., now?), not examined.

*Ammophila barbara semota* DE BEAUMONT 1967: 265, ♀. **Holotype:** ♀, Turkey: Ankara: Dickmen (BMNH), examined, **new synonym.**

**Material examined:** 19♀♀, 33♂♂ (OÖLM), 4♀♀, 3♂♂ (NHMW), 3♀♀, 1♂ (coll. Schmid-Egger).

**Recognition:** *Ammophila barbara* has a forewing with two submarginal cells and a gastral apex black without metallic shine, the propodeal enclosure glabrous, the episternal sulcus ending at the level of the scrobe and the legs black. Both sexes of *A. theryi* are similar to *A. barbara* but differ in having partly red legs, the mesothoracic venter concave anteriorly for reception of the forecoxa, the depression margined by a carina that forms a projection on each side. Additionally, the propodeal enclosure in *A. theryi* is covered with appressed silvery setae along the midline and glabrous laterally and the posterior margin of the forecoxa is armed with a small apical spine. Both sexes of *A. terminata* differ from *A. barbara* in having three submarginal cells, a gastral apex with metallic shine and the episternal sulcus extending to the anteroventral margin of the pleuron. The female of the South African species *A. saussurei* resembles *A. barbara* in having two submarginal cells but differs in having the mesopleuron distinctly punctate (punctures 0-1 diameters apart) and legs, pronotal collar and scutum red (*A. barbara* has a mesopleuron irregularly transversely rugose).



**Description:** Forewings with two submarginal cells, gastral apex black without metallic shine, episternal sulcus ending at level of scrobe, propodeal enclosure glabrous, arolia distinctly developed and claws without basal tooth. Pronotal collar and scutum shiny, transversely striate, pronotal collar slightly elongate (Fig. 136) and scutellum longitudinally ridged. Mesothoracic venter not prominent anteriorly and posterior margin of forecoxa without apical spine.

♀: 15.5-19 mm. Black except tergum I and basal half of II red. In some specimens petiole red and mandible (except apex) and free margin of clypeus amber. Pronotal lobe and propodeum posterolaterally covered with appressed silvery setae, in some specimens also clypeus, frons and small stripe on mesopleuron along mesopleural suture. Mesopleuron irregularly transversely rugose, propodeal enclosure obliquely striate. Clypeus not elongate: Fig. 83, disk slightly convex: Fig. 105. Pronotal collar laterally: Fig. 190. Flagellomere I:  $II=1.8$ ; length of petiole = hindtarsomeres  $I+0.75 \times II$ .

♂: 12-17 mm. Black, with following red: tergum I (in most specimens black dorsally), gastral segment II and anterior half of III, in some specimens petiole partly or all. Clypeus, frons and in most specimens pronotal lobe and propodeum posterolaterally covered with appressed silvery setae. Mesopleuron irregularly rugose, pruinose, propodeal enclosure obliquely striate or irregularly rugose. Clypeus: Figs 245, 364; pronotal collar laterally: Fig. 300, dorsally: Fig. 331; gonostyle laterally: Fig. 433; penis valve laterally: Fig. 499, ventrally: Fig. 554, apically: Fig. 603. Flagellomere I:  $II=1.5-2.0$ ; length of petiole = hindtarsomeres  $I+0.75 \times II$  to  $I+II+0.25 \times III$ .

**Geographical distribution:** Turkey, Israel, Jordan, Syria, Algeria, Tunis, Morocco.

***Ammophila beaumonti* DOLLFUSS nov.sp. (Figs 54, 121, 193, 211, 275, 315, 346, 406, 468, 527, 586)**

**Records:** Holotype: ♂: Mongolia: Gobi: 100 km NW Dalanzagdad Bayanzad, 9. VII.2005, leg. J. Halada (OÖLM). Paratypes: Mongolia-SE: 70 km S Saynshand, 1100m, 6. VIII.2007, leg. M. Halada (1♂, OÖLM). Mongolia: Gobi: 100 km NW Dalanzagdad Bayanzad, 9. VII.2005, leg. J. Halada (1♀, OÖLM); Mongolia: Gobi National Park, Gurvan Saykhan-N, 44°00'N 101°80'E, 10. VI.2005, leg. J. Halada (1♀, OÖLM).

**Name of derivation:** In remembrance of the outstanding specialist of Sphecidae Dr. Jacques de Beaumont, Lausanne, Switzerland.

**Recognition:** *Ammophila beaumonti* is characterized by partly red legs, the mesothoracic venter concave anteriorly for the reception of the forecoxa, the depression margined by a carina that forms a projection on each side, a pronotal collar anteriorly emarginate (Figs 121, 193, 315) and the head, the thorax and the propodeum covered with dense appressed silvery setae. It is similar to *A. gracillima* and *A. tekkensis* but differs in having a pronotal collar anteriorly emarginate. The male of *A. dentigera* differs from *A. beaumonti* in having a forecoxa ventrally with a small tooth (Fig. 25) and a pronotal collar anteriorly not emarginate. The male of *A. elongata* differs from *A. beaumonti* in having a pronotal collar distinctly transversely ridged (*A. beaumonti* has a microstriate pronotal collar).

**Description:** ♂: 13.5-14.5 mm. Black, with following reddish-brown: mandible (except apex), tegula, foreleg (except coxa), midleg (except coxa and trochanter), hindfemur (except basal half), hindtibia and hindmetatarsus, tergum I, gastral segments



II-V; terga VI and VII dorsally black, without metallic shine. Head (except vertex), thorax, propodeum (including propodeal enclosure), coxa and trochanter covered with appressed silvery setae; petiole and legs partly pruinose. Erect silvery-white setae cover only head and prosternum, on gena nearly as long as flagellomere I. Inner margin of mandible with one subapical tooth, clypeus broadly elongate and anteriorly broadly emarginate (Fig. 211), disk slightly concave (Fig. 346). Supra-antennal lamellate projection absent, vertex shiny. Pronotal collar distinctly elongate and anteriorly emarginate (Figs 275, 315), dorsally transversely microstriate. Scutum transversely microstriate, scutellum slightly longitudinally ridged, propodeal enclosure longitudinally striate, mesopleuron and metapleuron dull. Mesothoracic venter concave anteriorly for reception of forecoxa, depression margined by carina that forms one projection on each side, episternal sulcus lacking, arolia well developed, claws without basal tooth. Petiole slightly longer than tergum I (9: 8). Gonostyle laterally: Fig. 406; penis valve laterally: Fig. 468, ventrally: Fig. 527, apically: Fig. 586. Flagellomere I: II=1.8; length of petiole = hindtarsomeres I+II+III.

♀: 17 mm. Black with following reddish-brown: mandible (except apex), clypeus along ventral margin, tegula, fore- and midlegs (except coxae), hindleg (partly darkened), gaster (except petiole). Head (except vertex), thorax, propodeum (including propodeal enclosure), coxae, trochanters and basal half of femora covered with appressed silvery setae; silvery-white erect setae as long as scape on head, prosternum and foreleg. Clypeus not elongate (Fig. 54), disk convex. Pronotal collar elongate, anterior carina prominent (Fig. 193) and emarginate (Fig. 121), dorsal surface transversely microstriate. Scutum transversely microstriate, admedian line distinct; scutellum longitudinally striate and propodeal enclosure longitudinally striate. Dense, appressed setae concealing sculpture on mesonotum, metanotum, and propodeum laterally. Episternal sulcus ending at level of scrobe, arolia distinct, claws without basal tooth. Foretarsomere I: II=2.0; length of petiole = hindtarsomeres I+II.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Mongolia (Gobi).

### ***Ammophila borealis* LI & YANG (Figs 642-657)**

*Ammophila borealis* LI & YANG 1990: 263, ♀, ♂. Holotype: ♀, China: Nei Mongol: Hailar City (Beijing Agricultural University), not examined.

**M a t e r i a l e x a m i n e d :** None.

**D e s c r i p t i o n :** (LI & YANG 1990: 263, translated from Chinese by Yan Chengjin): "♀: Body length 16.0-17.5 mm. Black; tergum I largely, tergum II, sternum II, base of sternum III and tergum III yellowish red; apical black portion of abdomen without metallic blue luster; posterior part of tegula and wings yellowish brown, veins pale brown to brown. Vertex, gena and clypeus with long black setae; head and thorax with long, erect, white or black setae. Pronotal lobe with pubescence or not, mesopleuron posteriorly covered with dense appressed setae or setae not distinct. Gastral petiole ventrally with sparse pubescence.

Vertex, frons and clypeus sparsely punctate, without supra-antennal projection. Postocellar diameter (ODD): postocellar distance (POD): oculocellar distance (OOD): interocular distance at anterior ocellus (IODP): interocular distance at clypeus (IODC) = 1: 1.3-2.1: 2.7-3.8: 8-10.6: 7-9. Relative length of antennal pedicel: flagellomere I: II. III: IV = 1.2-1.6: 4-5.7: 2.2-3.2: 2-3: 1.5-2.2. Pronotal collar length: width = 3.5-5.5: 7.6-

10.5, sparsely punctate, with shallow median furrow; transversely, densely, finely (but not distinctly) striate on anterior slope; scutum transversely, densely finely striate and punctate, with admedian line; scutellum coarsely, longitudinally striate; metanotum without distinct striae; propodeal enclosure with median carina, surface coarsely, obliquely striate laterally. Mesopleuron and mesosternum without distinct rugose striae; with episternal sulcus and anterior part of mesosternum normal. Metapleuron and lateral side of propodeum coarsely rugose-striate. Submarginal cell III of forewing petiolate. Foretarsus asymmetrical; hindleg, relative length of tibia: tarsomeres I: II: III = 17-23: 9.5-12.7: 4.9-6.9: 4.1-5.3, claws simple, with pulvillus. Length of gastral petiole: tergite I: II = 11-15.8: 11.4-14.9: 9.3-12.3.

♂: Body length 17.0-17.5 mm. Similar to female. Tergum I and tergum II with brown or black stripe on dorsum; wing veins dark brown. Head with long, black setae; prothorax and scutum with long, black or white setae, other areas with long white setae. Clypeus and lower areas of frons covered with dense appressed setae; anterior margin of clypeus emarginate medially. ODD: POD: OOD: IODP: IODC = 1: 2: 3.3-3.5: 9.8-10.2: 2.5-5.1. Relative length of antennal pedicel: flagellomere I: II: III = 1.3: 4.7-5.3: 3.1-3.5: 1.6-1.8. Pronotal collar length: width = 4-5: 9-9.2. Scutum densely punctate, finely, transversely striate; metapleuron and lateral side of propodeum finely rugose-striate. Hindleg, relative length of tibia: tarsomeres I: II = 22: 12-12.1: 6-6, 2: 4.6-4.9. Length of gastral petiole: tergite I: II = 18-19.5: 15.8-16.2: 12.4-12.7. Genitalia (Figs 651, 652, 655, 656, 657).

**R e l a t i o n s h i p s .** This new species is related to *A. pubescens* CURTIS (1836) and *A. mongolensis* TSUNEKI (1971), but it can be easily distinguished from the latter by the combined characters of relative length of ODD, POD, OOD, IODP, and IODC, gastral petiole of female ventrally sparsely pubescent, male tergum I and tergum II with brown or black stripe on the dorsum, and a different shape of male genitalia."

**G e o g r a p h i c a l d i s t r i b u t i o n :** China: Hunjiang City, Jilin Province; Nei Mongol; Pinquan Co., Hebei Province.

### ***Ammophila brevipennis* BINGHAM (Figs 56, 150)**

*Ammophila brevipennis* BINGHAM 1897: 232, ♀. Holotype: ♀, India: Maharashtra (BMNH), examined.

**M a t e r i a l e x a m i n e d :** Holotype ♀ (BMNH); India: Bombay Matheran 1939 (1♀, BMNH).

**R e c o g n i t i o n :** The female of *Ammophila brevipennis* has a black gastral apex without a metallic shine, the supra-antennal lamellate projection absent and the episternal sulcus extending to the anteroventral margin of the pleuron, the mesothoracic venter not prominent anteriorly. It has the clypeus free margin rounded, without a distinct median lobe, and a red petiole. The propodeal enclosure is rugose and covered with appressed silvery setae along midline. The female of *A. assimilis* differs from *A. brevipennis* in having the clypeus with a distinct median lobe delimited laterally by a small angle (Fig. 57) and an all black petiole. The female of *A. punctata* differs from *A. brevipennis* in having a scutum densely and coarsely punctate (punctures 0-1 diameter apart), the mesopleuron punctate as the scutum, the clypeus with a distinct median lobe (Fig. 60) and a black petiole (*A. brevipennis* has the scutum sparsely and finely punctate and the mesopleuron dull and punctato-rugose). The female of *A. sabulosa* differs from *A. brevipennis* in having the gastral apex with metallic shine, the propodeal enclosure all covered with erect setae and a black petiole.

**Description:** ♀: 20-23 mm. Black except petiole, tergum I, gastral segment II and segment III basally red. Gastral apex black, without metallic shine, supra-antennal lamellate projection absent, episternal sulcus extending to anteroventral margin of pleuron, mesothoracic venter not prominent anteriorly, arolia well defined and claws without basal tooth. Clypeus, pronotal lobe laterally, propodeum posterolaterally and propodeal enclosure medially covered with appressed silvery setae; erect setae on head and legs black. Ventral margin of clypeus rounded, without distinct median lobe (Fig. 56), disk nearly flat. Pronotal collar and scutum sparsely punctate, admedian line distinct. Scutellum punctate on anterior half, longitudinally ridged on posterior half. Propodeal enclosure irregularly rugose and covered with fine appressed silvery setae along midline, distinctly transversely ridged and glabrous laterally. Mesopleuron and metapleuron punctato-rugose. Pronotal collar laterally: Fig. 150. Flagellomere I: II=1.6; length of petiole = hindtarsomeres I+0.75×II.

The male of *A. brevipennis* differs from the female as follows (GUPTA 1960: 26): "head and thorax more densely pilose; shallow furrows on each side of the tegulae indistinct; petiole black in basal half".

**Geographical distribution:** India (Maharashtra, Himalaya).

***Ammophila campestris* LATREILLE (Figs 82, 188, 244, 299, 330, 363, 432, 496, 553, 602)**

*Ammophila campestris* LATREILLE 1809: 54.

*Ammophila retusus* GISTEL 1848: 142, sex not indicated. **Holotype or syntypes:** Germany: no specific locality (depository unknown). Synonymized with *Ammophila campestris* by MENKE 1964: 152, not examined.

*Ammophila neoxenus* F. SMITH 1856: 225, ♀, ♂. **Syntypes:** China: Shanghai (BMNH). Synonymized with *Ammophila campestris* by KOHL 1906: 319, not examined.

*Ammophila slovacica* ZAVADIL in ZAVADIL, ŠUSTERA & BAT'A 1937: 213, ♂. **Holotype:** ♂, Slovakia: DĚVINSKÁ KOBYLA (NMPC). Synonymized with *Ammophila campestris* by NOSKIEWICZ 1939: 163 and BALTHASAR 1972: 430, not examined.

**Material examined:** 35♀♀, 38♂♂ (OÖLM), 54♀♀, 57♂♂ (NHMW).

**Recognition:** *Ammophila campestris* has a submarginal cell III petiolate, the gastral apex black, without metallic shine, the propodeal enclosure is glabrous and the petiole venter has no distinct erect setae. Additionally, the mesothoracic venter is not prominent anteriorly, the episternal sulcus is extending to the anteroventral margin of the pleuron, the arolia are well developed and the claws have no basal tooth. The female of *A. pubescens* differs from *A. campestris* in having the petiole ventrally with distinct erect setae and a propodeal enclosure with oblique striae and the interspaces densely micropunctate (*A. campestris* has the propodeal enclosure shiny with oblique striae). The female of *A. asiatica* differs from *A. campestris* in having the clypeus and the frons covered with dense appressed silvery setae (*A. campestris* has the clypeus and the frons at most covered with scattered, short appresses silvery setae). The male of *A. pubescens* differs from *A. campestris* in having terga I and II with a black stripe dorsally, the propodeal enclosure obliquely striate, with the interspaces micropunctate and in many specimens the petiole ventrally with erect setae (*A. campestris* has the terga I and II all red, the propodeal enclosure obliquely striate and shiny). The similar male of *A. asiatica* differs from *A. campestris* in having a differently shaped pronotal collar in lateral view (Fig. 298) and distinctly denser appressed silvery setae (*A. campestris*, see pronotal collar in lateral view: Fig. 299).

**Description:** Submarginal cell III petiolate, gastral apex black, without metallic shine, propodeal enclosure glabrous and petiole venter without distinct erect setae. Mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia are well developed and claws without basal tooth.

♀: 12-16 mm. Black except tergum I (basally darkened), gastral segments II and III (partly or all) red. Pronotal lobe posteriorly, mesopleuron along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae; in some specimens clypeus and frons covered with scattered, short, appressed silvery setae; erect setae brownish. Clypeus slightly elongate, in most specimens without distinct median lobe (Fig. 82), disk convex. Pronotal collar smooth and shiny dorsally, lateral lobe finely transversely striate. In most specimens scutum dull and laterally finely transversely striate, scutellum longitudinally striate. Propodeal enclosure shiny, with oblique striae, mesopleuron dull and sparsely punctate or finely punctato-rugose, metapleuron and propodeum laterally longitudinally striate or punctato-rugose. Pronotal collar laterally: Fig. 188. Flagellomere I: II=1.5-1.7; length of petiole = hindtarsomeres I+0.5×II.

♂: 12-14 mm. Black except tergum I (basally darkened) and gastral segments II and III red. Clypeus, frons, pronotal lobe, patch along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae; erect setae whitish. Clypeus elongate and anteriorly slightly emarginate (Fig. 244), disk flat on the anterior half, slightly convex on posterior half (Fig. 363). Pronotal collar dull dorsally, lateral lobes transversely microstriate, scutum dull and transversely microstriate laterally, scutellum longitudinally striate. Propodeal enclosure obliquely striate and shiny, mesopleuron dull and sparsely punctate. Metapleuron and propodeum laterally obliquely punctato-rugose. Sterna VII and VIII covered with brownish appressed setae. Pronotal collar laterally: Fig. 299, dorsally: Fig. 330. Gonostyle laterally: Fig. 432; penis valve laterally: Fig. 496, ventrally: Fig. 553, apically: Fig. 602. Flagellomere I: II=1.1-1.4; length of petiole = hindtarsomeres I+0.75×II.

**Geographical distribution:** Europe, Central- and East-Asia.

### ***Ammophila cellularis* GUSSAKOVSKIJ (Fig. 183)**

*Ammophila cellularis* GUSSAKOVSKIJ 1930: 203, ♀. Holotype: ♀, Russia: SW-Siberia: Pavlodar (ZIN), photograph examined.

**Material examined:** photograph of holotype ♀ (ZIN).

**Recognition:** The female of *Ammophila cellularis* has a submarginal cell III petiolate, the gastral apex black without metallic shine, the propodeal enclosure glabrous and the supra-antennal lamellate projection absent. Additionally, the episternal sulcus is extending to the anteroventral margin of the pleuron and the mesothoracic venter is not prominent anteriorly, the arolia are well defined and the claws have no basal tooth. The female of *A. cellularis* differs from all species with a petiolate submarginal cell III in having red legs.

**Description:** ♀: 13 mm. Black, with following red: legs (coxa, trochanter, tarse and hindtibia partly black), tegula, petiole, tergum I (posteriorly black). Gastral segments II-VI dark reddish, partly with black patches. Clypeus, frons, mesopleuron, propodeum laterally and coxa covered with appressed silvery setae; erect setae whitish. Clypeal disk slightly convex, pronotal collar sparsely punctate (lateral view Fig. 183). Scutum

transversely striate on anterior half, obliquely striate on posterior half, scutellum longitudinally striate. Mesopleuron and propodeum laterally coriaceous, propodeal enclosure densely, finely, obliquely striate and glabrous. Flagellomere I: II=2.0; length of petiole = hindtarsomeres I+0.3×II.

♂ unknown.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Kazakhstan, Russia (Siberia).

***Ammophila clavus* (FABRICIUS) (Figs 70, 98, 166, 236, 287, 324, 357, 423, 484, 545, 591)**

*Sphex clavus* FABRICIUS 1775: 348, sex not indicated (as *clavus*). Holotype or syntypes: ♀, Nova Hollandia, now Australia: no specific locality (BMNH: Banks collection), not examined.

*Ammophila atripes* F. SMITH 1852: 46, ♀. Holotype or syntypes: ♀, India: Maharashtra: Khandaly (BMNH), syntype examined, **new synonym**.

*Ammophila basalis* F. SMITH 1856: 214, ♀. Lectotype designated by O'TOOLE 1999 (BMNH), examined, **new synonym**.

*Ammophila nigripes* F. SMITH 1856: 215, ♂. Holotype: ♂, India: Tamil Nadu: Madras (BMNH). Synonymized with *Ammophila basalis* by R. TURNER 1919: 396, examined.

*Ammophila dimidiata* F. SMITH 1856: 216, ♀, junior primary homonym of *Ammophila dimidiata* (CHRIST 1791). Syntypes: ♀, India: Bombay, Madras, north Bengal (BMNH), not examined. Tentatively synonymized with *Ammophila atripes* by R. BOHART & MENKE 1976: 151, synonymy confirmed.

*Ammophila simillima* F. SMITH 1856: 217, ♀. Holotype or syntypes: ♀, China: Hong-Kong (BMNH). Synonymized with *Ammophila atripes* by BINGHAM 1897: 229, not examined.

*Ammophila pulchella* F. SMITH 1856: 218, ♂. Syntypes: China: Hong Kong and Shanghai (BMNH). Synonymized with *Ammophila atripes* by BINGHAM 1897: 229, not examined.

*Ammophila longiventris* DE SAUSSURE 1867: 24, ♂. Lectotype: ♂: Sri Lanka: Trincomalee (MHNG), designated by MENKE in BOHART & MENKE 1976: 151. Synonymized with *Ammophila atripes* by BINGHAM 1897: 229, synonymy confirmed by W. SCHULZ 1911: 162, not examined.

*Ammophila humbertiana* DE SAUSSURE 1867: 25, ♀. Lectotype: ♀, Sri Lanka: Trincomalee (MHNG), designated by MENKE in BOHART & MENKE 1976: 151. Synonymized with *Ammophila atripes* by W. SCHULZ 1911: 161, not examined.

*Ammophila erythropus* TASCHENBERG 1869: 434, ♀, junior primary homonym of *Ammophila erythropus* F. SMITH 1856. Syntypes: Indonesia: Java: no specific locality (depository unknown).

*Ammophila spinosa* F. SMITH 1873: 259, ♀. Holotype or syntypes: ♀, China: Hong Kong (BMNH). Synonymized with *Ammophila atripes* by BINGHAM 1897: 229, not examined.

*Ammophila orientalis* CAMERON 1889: 9, ♀. Syntypes: origin not indicated, but probably India (OXUM). Synonymized with *Ammophila basalis* by BINGHAM 1897: 231. Syntype ♀ (NHMW), examined.

*Ammophila buddha* CAMERON 1889: 94, sex not indicated. Syntypes: India: Uttar Pradesh: Allahabad: and West Bengal: Barrackpore 20 km N Calcutta (OXUM). Synonymized with *Ammophila*

*A. atripes* by BINGHAM 1897: 229. Syntype: ♀ (NHMW), examined.

*Ammophila taschenbergi* CAMERON 1889: 94. Substitute name for *Ammophila erythropus* Taschenberg. Treated as *Ammophila atripes taschenbergi* by BOHART & MENKE 1976: 151.

*Ammophila japonica* KOHL 1906: 328, ♀, ♂. Lectotype: ♂, Japan: Kofou (MNHN), designated by MENKE in BOHART & MENKE 1976: 151, examined. Treated as *Ammophila atripes japonica* by BOHART & MENKE 1976: 151.

*Ammophila formosana* STRAND 1913: 85, ♀, ♂. Syntypes: Taiwan: many localities (DEI), not examined. Treated as *Ammophila atripes formosana* by BOHART & MENKE 1976: 151.

**M a t e r i a l e x a m i n e d :** 52♀♀, 96♂♂ (OÖLM), 8♀♀, 9♂♂ (coll. Jacobs), 4♀♀, 3♂♂ (coll. Schmid-Egger), 513♀♀, 561♂♂ (ZMHU).

**Recognition:** *Ammophila clavus* has the pronotal collar (Fig. 166) and the scutum distinctly transversely ridged, the gastral apex black, with blue metallic shine, the supra-antennal lamellate projection absent and the scutellum and the metanotum coarsely longitudinally ridged. The female of *A. punti* is similar but differs in having the gastral apex dull, black, without metallic shine but with a dark red tip apically, and the top of the head, the pronotum and the scutum with stiff black bristles (Fig. 164). The female of *A. haimatosoma* is similar to *A. clavus* but differs in having the head, the thorax and the propodeum variably red. The female of the Subsaharan *A. beniniensis* is similar to *A. clavus* but differs in having the head and the thorax more or less red, the thorax and the propodeum pruinose, the gaster nearly all metallic and the wings brown with a violet metallic shine. The male of *A. punti* is similar to *A. clavus* but differs in having the gaster without a metallic shine, the pronotum and the scutum with stiff black bristles (Fig. 164) and the head, the thorax and the propodeum more or less red. The male of *A. haimatosoma* is similar to *A. clavus* but differs in having the thorax and the legs more or less red.

**Note:** *A. clavus*, *A. punti*, *A. haimatosoma* and *A. beniniensis* are extremely similar, and further examinations about their status should be conducted.

**Description:** Pronotal collar and scutum distinctly transversely ridged, episternal sulcus ending at level of scrobe and gastral apex black, with blue metallic shine. Supra-antennal lamellate projection absent, scutellum and metanotum coarsely longitudinally ridged. Propodeal enclosure irregularly coarsely rugose along midline and covered with short erect setae, laterally coarsely transversely rugose and glabrous. Mesopleuron, metapleuron and propodeum laterally coarsely transversely punctato-rugose, mesothoracic venter anteriorly not prominent and claws without basal tooth.

♀: 19-30 mm. Black, with following variably red: scape, legs (except coxa and trochanter; last tarsomeres darkened), petiole, tergum I (basal third darkened). In some specimens pedicel, basal half of flagellomere I, pronotal collar, scutum, clypeus and tergum II partly redish-brown. Pronotal lobe and propodeum posterolaterally covered with appressed silvery setae, but in some specimens only pronotal lobe with fringe of short silvery setae on posterior margin. Erect setae black, wings distinctly yellowish-brown. Clypeal free margin arcuate (fig. 70), disk convex (Fig. 98); arolia lacking. Pronotal collar: Fig. 166. Flagellomere I:  $II=1.8-2.0$ ; length of petiole = hindtarsomeres  $I+0.6\times II$  to  $I+II+0.3\times III$ .

♂: 13-27 mm. Black, except tergum I laterally red. Gastral apex black, with metallic shine. Wings dark brownish. Clypeus, frons, pronotal lobe, and propodeum posterolaterally covered with appressed silvery setae; erect setae whitish. Clypeus slightly elongate (Fig. 236), clypeal disk convex (Fig. 357); mesopleuron transversely punctato-rugose, arolia distinct. Forecoxa with ventral apical spine. Gonostyle not abruptly narrowing to apical end: Fig. 423; penis valve characteristically shaped: Figs 484, 545, 591. Pronotal collar dorsally: Fig. 324. Flagellomere I:  $II=1.5-2.0$ ; length of petiole = hindtarsomeres  $I+II+0.75\times III$  to  $I+II+III+0.5\times IV$ . In some specimens the gaster is nearly all black, therefore this species is included twice in the key.

**Geographical distribution:** Australia, Indonesia, China, Japan, Laos, India, Nepal.



***Ammophila clypeola* LI & YANG (Figs 613/b-619)**

*Ammophila clypeola* LI & YANG 1990: 262, ♀. Holotype: ♀, China: Nei Mongol: Dongsheng County: Neimenggu (Beijing Agricultural University), not examined.

Material examined: None.

Description: (LI & YANG 1990: 262, translated from Chinese by Yan Chengjin): "♀: Body length 15.0 mm. Black; petiole apex ventrally, terga I-II, sterna II-III, side of tergum IV basally dark red, but with dark spot; gastral apex without metallic blue luster; posterior part of tegula and wings pale yellowish brown, veins pale brown. Vertex and clypeus with sparse, long setae, pale brown or white; gena and prosternum with more long setae, pale brown or white. Pronotal lobe, mesopleuron posteriorly and propodeum posterolaterally covered with dense appressed setae. Gastral petiole basally with sparse pubescence. Vertex, frons and clypeus sparsely punctate, without supra-antennal projection. Clypeus medially with roughly spherical protuberance. Postocellar diameter (ODD) = postocellar distance (POD): oculo-cellular distance (OOD): interocular distance at anterior ocellus (IODP): interocular distance at clypeus (IODC) = 1: 2.1: 3.6: 10: 8.7. Relative length of antennal pedicel: flagellomeres I: II: III = 1.4: 4.6: 2.7: 2. Pronotal collar length: width = 3.8: 9.6, sparsely punctate, with deep median furrow; transversely, densely, slenderly striate on anterior slope, laterally coarsely striate. Scutum sparsely punctate, with long admedian line. Scutellum coarsely, longitudinally rugose-striate; metanotum without distinct striae. Propodeal enclosure without median carina, surface obliquely slenderly striate laterally. Mesopleuron and mesosternal sparsely punctate, with episternal sulcus; medial region of anterior half of mesosternum normal. Metapleuron and lateral side of propodeum coarsely rugose-striate. Submarginal cell III of forewing petiolate. Foretarsus asymmetrical; hindleg, relative length of tibia: tarsus I: II: III = 21.2: 11.3: 6.3: 5.3, claw simple, with arolia. Length of gastral petiole: tergite I: II = 15.4: 14.4: 10.7.

♂ unknown.

Relationships. This new species is related to *A. campestris* LATREILLE (1809), but the latter can be easily distinguished from it by the gena and prothorax with long black setae, scutum transversely rugose-striate, propodeal enclosure with median carina."

Geographical distribution: China (Nei Mongol).

***Ammophila dentigera* GUSSAKOVSKIJ (Figs 25, 47, 122, 142, 212, 276, 316, 347, 407)**

*Ammophila dentigera* GUSSAKOVSKIJ 1928: 8, ♀, ♂. Paratypes: ♀, ♂ Uzbekistan: Khiva (ZIN), examined.

Material examined: Paratypes 1♀, 1♂ (ZIN); Kazakhstan: Aralsk city env. (1♂ OÖLM), S Balkhash lake 6 km E Mulaly (1♂ OÖLM), Tshilik riv. 3 km E Borandyser Masak (1♂ OÖLM), Charyn valley W Chundsä (1♂ coll. Schmid-Egger). Turkmenistan: 15 km N Ashabat (4♂♂ OÖLM). Uzbekistan: Kyzyl-Kum desert Uchkuduk (1♀ OÖLM).

Recognition: *Ammophila dentigera* has the gastral apex black without a metallic shine, the mesothoracic venter anteriorly prominent, with a transverse carina that in most specimens forms a median projection, additionally the forecoxa has a medioventral acute tooth (Fig. 25). The pronotal collar is nearly as long as posteriorly broad and without rugae (Figs 122, 142, 276, 316). The female of *A. tekkensis* differs from *A. dentigera* in having the clypeus not distinctly elongate and the mesothoracic venter anteriorly with a transverse carina that forms one projection on each side and a forecoxa without a

medioventral tooth. The female of *A. induta* is similar to *A. dentigera*, but differs in having the mesothoracic venter not prominent, the forecoxa lacks an acute tooth and the propodeal enclosure along the midline is covered with appressed silvery setae, glabrous and finely, obliquely striate laterally (*A. dentigera* has the propodeal enclosure all covered with appressed silvery setae). The female of *A. dentigera* differs from *A. producticollis* in having a mesothoracic venter anteriorly prominent with a transverse carina that in most specimens forms one median projection and in having a forecoxa with an acute tooth (Fig. 25). The male of *A. guichardi* differs from *A. dentigera* in having a mesothoracic venter anteriorly not prominent, the forecoxa without an acute tooth, in the shape of gonostyle laterally (Fig. 380) and penis valve laterally (Fig. 450). The male of *A. producticollis* differs from *A. dentigera* in having a mesothoracic venter not prominent anteriorly, the forecoxa without an acute tooth and a clypeal disk distinctly convex (Fig. 344). The male of *A. induta* is similar to *A. dentigera* but differs in having a mesothoracic venter anteriorly not prominent and the forecoxa without an acute tooth.

**Description:** Gastral apex black, without metallic shine, mesothoracic venter anteriorly prominent, with transverse carina that in most specimens forms median projection, forecoxa with medioventral acute tooth (Fig. 25) and supra-antennal lamellate projection absent. Episternal sulcus extending to anteroventral margin of pleuron, arolia distinct and claws without basal tooth. Head (except of vertex), thorax and propodeum (including propodeal enclosure) all covered with appressed silvery setae; erect setae white and wings hyaline. Pronotal collar nearly as long as posteriorly broad and without rugae (Figs 122, 142, 276, 316), scutum sculptured similarly as collar, admedian line nearly lacking and scutellum with two longitudinal rugae.

♀: 15-16 mm. Black, with following yellowish-brown: mandible (except of apex), free margin of clypeus, scape, pedicel, tegula, fore- and midlegs, hindlegs (coxa, trochanter and femur darkened dorsally) and gaster (partly darkened). Clypeus elongate, with broad median lobe (Fig. 47). Flagellomere I: II = 1.6; length of petiole = hindtarsomeres I+II.

♂: 14-18.5 mm. Black, with following yellowish-brown: mandible (except of apex), clypeus adjacent to free margin, apical spot on scape, tegula, legs (partly darkened) and gaster (in some specimens nearly all dark-brown); petiole dark brown. Clypeus elongate, with median lobe truncate or slightly emarginate (Fig. 212), disk slightly convex (Fig. 347). Propodeal enclosure transversely striate and petiole distinctly longer than tergum I (8: 6). Pronotal collar laterally: Fig. 276, dorsally: Fig. 316. Gonostyle laterally with long erect setae on dorsal and ventral surfaces (Fig. 407). Flagellomere I: II = 1.0-1.4; length of petiole = hindtarsomeres I+II+0.5×III to I+II+0.75×III.

**Geographical distribution:** Afghanistan, Iran, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan.

***Ammophila deserticola* TSUNEKI**

*Ammophila deserticola* TSUNEKI 1971: 169, ♂, ♀. Holotype: ♂, Mongolia: Bulgan Aymag: Somon Abzaga (TMB), examined.

**Material examined:** 16 ♀, 43 ♂♂ (OÖLM), 2 ♂♂ (ZMHU), 1 ♀ (NHMW).

**Recognition:** *Ammophila deserticola* has a submarginal cell III petiolate, the supra-antennal lamellate projection distinctly developed and the propodeal enclosure glabrous. The female of *A. sarekandana* is similar and shares with *A. deserticola* a well developed supra-antennal lamellate projection but differs in having the scutum with distinct transverse striae and the mesopleuron without a patch of appressed silvery setae (*A. deserticola* has a dull scutum, transversely microstriate and a small patch of appressed silvery setae on the mesopleuron). The female of *A. pubescens* differs from *A. deserticola* in lacking the supra-antennal lamellate projection, in having the petiole ventrally with long erect setae and the propodeal enclosure distinctly micropunctate between oblique striae (*A. deserticola* has the propodeal enclosure obliquely striate and more or less shiny and the petiole ventrally without erect setae). The female of *A. campestris* differs from *A. deserticola* in lacking the supra-antennal lamellate projections, and in having light brown erect setae on the head. The male of *A. sarekandana* shares with *A. deserticola* a well developed supra-antennal lamellate projection, but differs in having the scutum anteriorly coarsely and nearly densely punctate, and the mesopleuron coarsely punctato-rugose (*A. deserticola* has the scutum dull and finely transversely microstriate and a dull and punctate mesopleuron). The male of *A. pubescens* differs from *A. deserticola* in having terga I and II with a dorsal black stripe, the supra-antennal lamellate projection absent and in most specimens the petiole ventrally with erect setae (*A. deserticola* has the tergum II all red). The male of *A. campestris* differs from *A. deserticola* in having the supra-antennal lamellate projection absent and the propodeal enclosure obliquely striate and in most specimens shiny (*A. deserticola* has a dull propodeal enclosure).

**Description:** Submarginal cell III petiolate, gastral apex black, without metallic shine, supra-antennal lamellate projection distinctly developed, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia well defined and claws without basal tooth, propodeal enclosure glabrous.

♀: 14.5-16.5 mm. Black except tergum I (except basal part), gastral segment II and basal part of III red. Small patch on mesopleuron along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae. Head and prothorax covered with black erect setae, on other areas silvery-white. Clypeus slightly elongate, with distinct median lobe and more or less developed lateral teeth, disk convex. Pronotal collar dull or slightly shiny and sparsely punctate, scutum dull, transversely microstriate and sparsely punctate, scutellum longitudinally striate and punctate. Mesopleuron dull and distinctly punctate (punctures 1-2 diameters apart), metapleuron and propodeum laterally obliquely punctato-rugose. Propodeal enclosure obliquely striate and more or less shiny. Flagellomere I: II=1.5-1.6; length of petiole = hindtarsomeres I+0.3×II.

♂: 13-16.5 mm. Black except tergum I (basally darkened), gastral segments II and segment III basally. Clypeus, frons, small patch on mesopleuron near mesopleural suture

and propodeum posterolaterally covered with fine appressed silvery setae; head and propleuron covered with brown erect setae, remaining areas with white ones. Clypeus elongate and slightly emarginate medially, disk nearly flat. Pronotal collar sparsely punctate, scutum dull and finely transversely microstriate, scutellum longitudinally ridged. Propodeal enclosure dull and obliquely striate, mesopleuron dull and punctate (punctures 1-2 diameters apart), metapleuron and propodeum laterally obliquely punctato-rugose. Sterna VII and VIII covered with brown appressed setae; genitalia as in *A. campestris*. Flagellomere I: II=1.4-1.6; length of petiole = hindtarsomeres I+0.5×II to I+0.75×II.

**G e o g r a p h i c a l d i s t r i b u t i o n :** China, Mongolia, Kyrgyzstan.

***Ammophila djaouak* DE BEAUMONT (Figs 226, 341, 399, 462, 521, 580)**

*Ammophila djaouak* DE BEAUMONT 1956: 178, ♂. **Holotype:** ♂, Libya: n. Tripolitania: Gargaresh (BMNH), examined.

**M a t e r i a l e x a m i n e d :** **Holotype** ♂ (BMNH). **Tunisia:** Tataouine (1♂ OÖLM), 15 km S Zarzis Ras Lemsas 33°41'N 11°11'E (2♂♂ coll. Schmid-Egger).

**R e c o g n i t i o n :** *Ammophila djaouak* has a gastral apex without metallic shine, the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron. The male of *A. hemilauta* differs from *A. djaouak* in having the inner margin of the mandible with two subapical teeth and no basal tooth, the labrum with a spine on the anterior margin and the shape of the gonostyle (Fig. 398) and the penis valve (Figs 460, 578) (*A. djaouak* has one subapical tooth on the inner margin of the mandible and one blunt basal tooth, and the labrum has no spine). The male of *A. albotomentosa* differs from *A. djaouak* in having the clypeus less elongate (Fig. 225), the thorax covered with dense appressed silvery setae that obscure the underlying sculpture and in characteristically shaped gonostyle (Fig. 385) and penis valve (Fig. 456) (*A. djaouak* has a thorax with appressed silvery setae that not obscure the underlying sculpture).

**D e s c r i p t i o n :** ♂: 20-21.5 mm. Gastral apex without metallic shine, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia large and claws without basal tooth. Black, with following yellowish-brown: mandible (except apex), tegula, fore- and midlegs (except coxa), hindfemur apically, hindtibia (except apically), petiole (dorsally darkened), tergum I (except for black dorsal stripe) and remaining areas of gaster (except some dark spots). Head, thorax and propodeum covered with appressed silvery setae that do not obscure sculpture on pronotal collar, scutum and metanotum; erect setae whitish. Inner margin of mandible with one subapical tooth and one blunt basal tooth; supra-antennal lamellate projection slightly developed. Ventral margin of clypeus elongate, narrowed and emarginated medially (Fig. 226), disk concave on ventral half and convex on dorsal half (Fig. 341), labrum anteriorly armed with preapical spine. Pronotal collar slightly punctate, not transversely ridged. Scutum distinctly transversely punctato-rugose, scutellum punctate and longitudinally striate. Propodeal enclosure irregularly coarsely rugose, covered with sparse appressed silvery setae and with erect setae. Genitalia characteristically shaped: gonostyle laterally: Fig. 399; penis valve laterally: Fig. 462, ventrally: Fig. 521 and apically: Fig. 580. Sternum VIII slightly emarginate. Flagellomere I: II=1.7; length of petiole = hindtarsomeres I+II+0.3×III.

♀ unknown.

Geographical distribution: Egypt, Libya, Tunisia.

***Ammophila dubia* KOHL (Figs 30, 176, 223, 384, 454, 518, 572)**

*Ammophila dubia* KOHL 1901: 159, ♀, ♂. Lectotype: ♀, Egypt (no specific locality) (NHMW), examined, **present designation**.

**Material examined**: lectotype ♀, 12♀♀, 12♂♂ (NHMW), 3♀♀, 10♂♂ (OÖLM), 2♂♂ (coll. Jacobs), 2♀♀, 4♂♂ (coll. Schmid-Egger).

**Recognition**: *Ammophila dubia* has the gastral apex with a metallic shine, terga V-VI (VII) pruinose, the pronotal collar with no transverse rugae and the mesothoracic venter not prominent anteriorly. Additionally, the episternal sulcus is extending to the anteroventral margin of the pleuron. The head (except vertex), the thorax and the propodeum (including propodeal enclosure) are evenly covered with appressed silvery setae that partly obscure the underlying sculpture; the erect setae are silvery-white. Both sexes of *A. holosericea* differ from *A. dubia* in having distinct spots of appressed silvery setae on the pronotal lobe, the mesopleuron along the mesopleural suture and the propodeum posterolaterally, and in having a black petiole. The female of *A. dubia* differs from the similar *A. poecilocnemis* in having the last terga pruinose, and from *A. erminea* and *A. rubripes* in having the gastral apex with a metallic shine. Both sexes of *A. heydeni* differ from *A. dubia* in having distinct spots of appressed silver setae on the mesopleuron along the mesopleural suture and the propodeum posterolaterally and the gastral apex without a metallic shine. The male of *A. poecilocnemis* differs from *A. dubia* in having the gastral apex not pruinose and the gonostyle characteristically broadened at the apical third (Fig. 383), and that of *A. rubripes* in having a differently shaped clypeus (Fig. 220), a differently shaped penis valve (Figs 448, 513, 567) and the gastral apex without a metallic shine. The male of *A. erminea* differs from *A. dubia* in having the gastral apex without a metallic shine.

**Description**: Gaster apex with metallic shine, terga V-VI (VII) pruinose. Supra-antennal lamellate projection absent, pronotal collar without transverse rugae and mesothoracic venter not prominent anteriorly. Episternal sulcus extending to anteroventral margin of pleuron, arolia well defined and claws without basal tooth. Head (except vertex), thorax and propodeum (including propodeal enclosure) evenly covered with appressed silvery setae that partly obscure underlying sculpture; erect setae silvery-white.

♀: 17-20 mm. Black, with following yellowish-brown: mandible (except apex), legs (partly darkened), petiole, tergum I and gastral segments II and III (in some specimens with dorsal black stripe); in some specimens clypeus adjacent to free margin, scape, pronotal collar and pronotal lobe also yellowish-brown. Scutum transversely punctatogrugose, scutellum longitudinally striate and punctate. Propodeal enclosure irregularly transversely rugose, covered with fine appressed silvery setae and silvery-white erect setae. Flagellomere I: II=1.6-1.7; length of petiole = hindtarsomeres I+II to I+II+0.5×III.

♂: 15-17 mm. Black, with following yellowish-brown: mandible (except apex), scape (partly), tegula, petiole, tergum I, gastral segments II and III (all with black dorsal stripe) and legs (coxa, trochanter, mid- and hindfemora black dorsally). Clypeus slightly elongate and emarginate (Fig. 223), disk slightly convex. Scutum punctate, in some specimens punctures confluent to transverse rugae and scutellum coarsely punctate anteriorly and longitudinally ridged posteriorly. Gonostyle laterally: Fig. 384; penis

valve laterally: Fig. 454, ventrally: Fig. 518, apically: Fig. 572. Flagellomere I:  $II=1.4$ ; length of petiole = hindtarsomeres  $I+II+0.5\times III$  to  $I+II+0.75\times III$ .

**G e o g r a p h i c a l d i s t r i b u t i o n :** Egypt, Israel, Malta, Iran, Yemen, Libya, Morocco, Chad, Sudan.

***Ammophila electa* KOHL (Figs 71, 165, 237, 288, 325, 358, 411, 485)**

*Ammophila electa* KOHL 1901: 155, ♀, ♂. Lectotype: ♀, Algeria: Sidi Maklouf (MNHN), designated by MENKE in BOHART & MENKE 1976: 154; examined.

**M a t e r i a l e x a m i n e d :** 4♀♀, 8♂♂ (OÖLM), 1♀, 1♂ (NHMW), 15♀♀, 7♂♂ (coll. Schmid-Egger).

**R e c o g n i t i o n :** *Ammophila electa* has the gastral apex with a blue metallic shine and the supra-antennal lamellate projection well developed. In addition, the propodeal enclosure is transversely striate and glabrous, the pronotal collar and the scutum are transversely striate and the petiole red. Both sexes of *A. electa* resemble to *A. terminata* but differ in having a well developed supra-antennal lamellate projection and a red or partly red petiole. The female of *A. gussakovskii* resembles *A. electa* but differs in having the supra-antennal lamellate projection absent, the clypeus without appressed silvery setae and the median lobe of the clypeus medially emarginate (Fig. 72) (*A. electa* has the clypeus with appressed silvery setae and the clypeus free margin is not emarginate). The male of *A. gussakovskii* resembles to *A. electa* but differs in having no supra-antennal lamellate projection developed.

**D e s c r i p t i o n :** Gastral apex with blue metallic shine and supra-antennal lamellate projection well developed. Propodeal enclosure transversely striate and glabrous, mesothoracic venter anteriorly not prominent, episternal sulcus extending to anteroventral margin of pleuron, arolia large and claws without basal tooth. Pronotal collar and scutum transversely striate and scutellum longitudinally striate.

♀: 18.5-24 mm. Black except petiole and terga I- III red (sterna II and III brownish). Clypeus (adjacent to free margin broadly glabrous and smooth), lower part of frons, pronotal lobe, large patch along mesopleural suture, on propodeum small spot anterolaterally and large spot posterolaterally and dorsal face of hindcoxa covered with appressed silvery setae; erect setae brown or grey-whitish. Pronotal collar including lateral lobes and scutum shiny and distinctly transversely striate. Mesopleuron including mesothoracic venter distinctly transversely striate. Clypeus: Fig. 71; pronotal lobe laterally: Fig. 165. Flagellomere I:  $II=(1.6)1.8-2.2$ ; length of petiole = hindtarsomeres  $I+0.75\times II$  to  $I+II$ .

♂: 15-19 mm. Black except petiole (in some specimens basal half brown), tergum I and gastral segments II and III red. Clypeus, frons, pronotal lobe, large patch along mesopleural suture, on propodeum small spot anterolaterally and large spot posterolaterally covered with appressed silvery setae. In some specimens pronotal collar, scutum, mesothoracic venter and coxa pruinose; erect setae silvery-white and sterna VII and VIII covered with appressed brownish setae. Propodeal enclosure obliquely or irregularly striate and glabrous, mesopleuron including mesothoracic venter dull and irregularly sculptured. Clypeus dorsally: Fig. 237, laterally: Fig. 358; pronotal collar laterally: Fig. 288, dorsally: Fig. 325; gonostyle laterally: Fig. 411; penis valve laterally: Fig. 485. Flagellomere I:  $II=1.6-1.8$ ; length of petiole = hindtarsomeres  $I+II$  to  $I+II+III$ .

**G e o g r a p h i c a l d i s t r i b u t i o n :** Algeria, Morocco, Libya, Tunisia.



***Ammophila elongata* FISCHER DE WALDHEIM (Figs 66, 96, 131, 161, 232, 282, 319, 416, 478/a, 536)**

*Ammophila elongata* FISCHER DE WALDHEIM 1843: 2, ♂. Holotype: ♂, Southern Russia: no specific locality (ZMHU), examined.

Material examined: Holotype ♂ (ZMHU), Syntype ♀ (NHMW), 13 ♀ ♀, 22 ♂ ♂ (OÖLM), 6 ♀ ♀, 1 ♂ (NHMW), 2 ♂ ♂ (BMNH).

Note: The female described by F. MORAWITZ (1890: 583) as *A. occipitalis* is characterized by an anterior impression of the pronotal collar that intersects its anterior transverse carinae medially. I have examined many females in the OÖLM-collection. They have been collected in the same places as the males of *A. elongata*, but males of *A. occipitalis* were absent there. Therefore I came to the conclusion that these females are conspecific with *A. elongata*. This opinion was confirmed by V. Kazenas (Almaty, Kazakhstan) and A. Antropov (Moscow, Russia), which examined the specimens in their collections.

Recognition: *Ammophila elongata* has the pronotal collar coarsely transversely ridged and the gastral apex black without a metallic shine, the mesothoracic venter anteriorly concave for reception of the forecoxa and the depression margined by a carina that forms one projection on each side. Additionally, the episternal sulcus ends at the level of the scrobe. The female of *A. occipitalis* differs from *A. elongata* in having an episternal sulcus extending to the anteroventrad margin of the pleuron and a pronotal collar without an anterior concavity that intersects the anterior carinae (Figs 132, 162). The female of *A. gracillima* differs from *A. elongata* in having a propodeal enclosure all covered with appressed silvery setae and the pronotal collar anteriorly without concavity (*A. elongata* has the propodeal enclosure covered with appressed silvery setae only along midline and the pronotal collar with anterior concavity that intersects the anterior carinae). The male of *A. gracillima* differs from *A. elongata* in having a pronotal collar anteriorly not emarginate and a pronotal enclosure all covered with appressed silvery setae (*A. elongata* has the pronotal collar emarginate anteriorly). The male of *A. elongata* differs from *A. occipitalis* in having the pronotal collar anteriorly prominent and medially emarginate (Fig. 319) and the episternal sulcus ending at the level of scrobe.

Description: Gastral apex black, without metallic shine, supra-antennal lamellate projection absent, mesothoracic venter anteriorly concave for reception of forecoxa and the depression margined by carina that forms one projection on each side. Episternal sulcus ending at level of scrobe, arolia well developed and claws without basal tooth.

♀: 20-25.5 mm. Black, with following parts variably red: mandible (except apex), free margin of clypeus, scape, legs (except coxa), pronotal collar (partly black), scutum laterally, tegula, propodeal enclosure, petiole (partly), tergum I and gastral segments II-IV. Clypeus, frons, pronotum laterally, thorax laterally and ventrally, propodeum laterally, propodeal enclosure medially and coxa covered with dense appressed silvery setae. Vertex, pronotal collar, scutum, scutellum and metanotum pruinose; erect setae silvery-white and unusually long on gena and forelegs. Clypeus slightly elongate (Fig. 66), disk nearly flat (Fig. 96). Pronotal collar coarsely transversely ridged with wide triangular antero-median concavity that intersects anterior transverse carina (Fig. 131, 161). Scutum smooth and sparsely punctate along deep admedian line and coarsely transversely ridged laterally; scutellum and metanotum coarsely longitudinally ridged. Propodeal enclosure rugose and covered with appressed silvery setae along midline,

obliquely ridged and glabrous laterally. Mesopleuron, metapleuron and propodeum laterally coarsely transversely rugose, but covered with dense appressed silvery setae that obscure most of the sculpture. Flagellomere I:  $II=2.0-2.2$ ; length of petiole = hindtarsomeres  $I+0.5 \times II$  to  $I+0.75 \times II$ .

♂: 16-21 mm. Black, with following red: mandibles (except apex), legs (except coxa), tegula, tergum I and gastral segments II and III (IV). In some males mandible and legs nearly all black. Clypeus, frons, pronotal lobe and mesopleuron covered with dense appressed silvery setae. Gena, pronotal collar, scutum, metapleuron, coxa and propodeum laterally pruinose; erect setae white and unusually long on gena. Clypeus slightly elongate and broadly emarginated (Fig. 232), disk flat. Pronotal collar coarsely transversely ridged, anteriorly prominent and medially emarginated (Figs 282, 319), high occipital carina well fitting beneath. Scutum coarsely transversely ridged and punctate, scutellum longitudinally ridged. Propodeal enclosure reticulate and covered with appressed silvery setae along midline, obliquely coarsely ridged and glabrous laterally. Mesopleuron, metapleuron and propodeum laterally coarsely punctato-rugose. Gonostyle laterally: Fig. 416; penis valve laterally: Fig. 478/a, ventrally: Fig. 536. Flagellomere I:  $II=1.8-2.5$ ; length of petiole = hindtarsomeres  $I+0.75 \times II$  to  $I+II+0.5 \times III$ .

**Geographical distribution:** East Turkey, South Russia, Iran, Kazakhstan, Turkmenistan, Mongolia.

### ***Ammophila erminea* KOHL (Figs 40, 381, 451, 515, 569)**

*Ammophila erminea* KOHL 1901: 157, ♀, ♂. **Lectotype:** ♀, Egypt: no specific locality (NHMW), examined, **present designation**.

*Ammophila dantoni* ROTH in NADIG 1933: 101, ♂ only. **Syntype:** ♂, Morocco: Marrakech (Zürich), examined, **new synonym**.

**Material examined:** **Lectotype** ♀ (NHMW), 43 ♀♀, 15 ♂♂ (OÖLM), 37 ♀♀, 28 ♂♂ (NHMW), 2 ♀♀, 1 ♂ (BMNH), 10 ♀♀, 8 ♂♂ (coll. Schmid-Egger).

**Note:** The male described by ROTH (in NADIG 1933: 101) as *Ammophila dantoni* is conspecific with *A. erminea* and the female of *A. dantoni* is conspecific with *A. rubripes*.

**Recognition:** *A. erminea* has the gastral apex black without a metallic shine and slightly pruinose, the pronotal collar and the scutum not transversely striate and the mesothoracic venter not prominent. Additionally, the episternal sulcus extends to the anteroventral margin of the pleuron. The dense appressed silvery setae on the head, the thorax and the propodeum obscure most of the underlying sculpture. The female of *A. erminea* is similar to *A. rubripes* but differs in having the scutum with absent or vestigial transverse striae and in most specimens the appressed silvery setae cover the underlying sculpture on thorax and propodeum (*A. rubripes* has a scutum with transverse striae). The female of *A. horni* differs from *A. erminea* in having a transversely striate scutum. The female of *A. heydeni* differs from *A. erminea* in having the metapleuron not or inconspicuously covered with appressed silvery setae and the scutum distinctly transversely striate and punctate. The male of *A. erminea* is similar to *A. rubripes* but differs in having a scutum punctate and the penisvalve in apical view is evenly rounded (Fig. 569), not distinctly narrowed basally as in *A. rubripes* (Fig. 567). The male of *A. guichardi* differs from *A. erminea* in having a more elongate clypeus (Fig. 221) and a characteristically shaped penis valve (Figs 450, 514). The male of *A. heydeni* differs from *A. erminea* in having the scutum transversely striate and punctate, the metapleuron

not or inconspicuously covered with appressed silvery setae and the clypeal lobe medially slightly emarginated (Fig. 218).

**Description:** Gastral apex black, without metallic shine and slightly pruinose, pronotal collar and scutum not transversely striate and mesothoracic venter not prominent. Episternal sulcus extending to anteroventral margin of pleuron, arolia well developed and claws without basal tooth. Dense appressed silvery setae on head, thorax and propodeum obscure most of underlying sculpture, erect setae silvery-white and supra-antennal lamellate projection absent.

♀: 14-21 mm. Black, with following red: mandible (except apex), clypeus next to free margin, spot anteriorly on apical half of scape, tegula, fore- and midlegs (except coxa), hindlegs (except coxa, trochanter, basal third of femur and spot on tibia apically), petiole (partly or all), tergum I and gastral segments II-IV (in many specimens dorsally black). Clypeus elongate (Fig. 40), ventral third not covered with appressed silvery setae, disk convex. Scutellum longitudinally striate and medially with longitudinal furrow. Propodeal enclosure transversely striate and covered with more or less sparse appressed silvery setae and white erect setae. Flagellomere I:  $I=1.6-1.9$ ; length of petiole = hindtarsomeres I+II to I+II+0.5×III.

♂: 14.5-17 mm. Black, with following red: mandible (except apex), scape (as in ♀), tegula, fore- and midlegs (except coxae), hindlegs (as in ♀), petiole, tergum I (except dorsal black stripe), terga II-IV (in some specimens partly darkened) and sterna II-V. Clypeus elongate, median lobe of clypeus straight, disk on ventral half flat, on dorsal half slightly convex. Gonostyle laterally: Fig. 381; penis valve laterally: Fig. 451, ventrally: Fig. 515, apically: Fig. 569. Flagellomere I:  $II=1.5-1.9$ ; length of petiole = hindtarsomeres I+II+0.5×III to I+II+III.

**Geographical distribution:** Jordan, Israel, Egypt, Arabian Peninsula, North Africa, Western Sahara.

### ***Ammophila exsecta* KOHL (Figs 43, 115, 138)**

*Ammophila propinqua* var. *exsecta* KOHL 1906: 364, ♀. Holotype: ♀, Syria: no specific locality (NHMW), examined.

**Material examined:** Holotype ♀ (NHMW); Syria: no specific locality (1♂ NHMW). Jordan: Jordan Valley Mubalath (1♀ OÖLM). Oman: N Nizwa Jabal Akdar Massif (2♀♀ coll. Schmid-Egger).

**Recognition:** Both sexes of *A. exsecta* are similar to *A. rubripes* and differ only in having the anterior surface of the pronotal collar concave in lateral view (fig. 138) (*A. rubripes* has the anterior surface of the pronotum evenly rounded).

**Description:** Gastral apex black without metallic shine, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia well developed and claws without basal tooth.

♀: 18-21.5 mm. Black, with following more or less variably red: mandible (except apex), ventral half of clypeal disk, anterior face of scape, pronotal collar (dorsally narrow, laterally broader), tegula, petiole (dorsally black), tergum I (basally black), gastral segments II-III (IV), legs (except hindcoxa dorsally and mid- and hindfemora). Head (except clypeus ventral half and vertex), thorax, propodeum and coxa evenly covered

with appressed silvery setae; pronotal collar dorsally, scutum and propodeal enclosure pruinose. Erect setae on head, thorax and propodeum (including propodeal enclosure) whitish. Clypeus elongate (Fig. 43), ventral half coarsely, sparsely punctate and glabrous, dorsal half covered with dense appressed silvery setae, disk distinctly convex. Pronotal collar in lateral view with concave anterior surface (Figs 115, 138), dorsally impunctate and shiny. Scutum punctate and transversely striate, scutellum coarsely punctate and longitudinally ridged. On mesopleuron, metapleuron and propodeum laterally sculpture obscured by appressed silvery setae. Propodeal enclosure coarsely transversely ridged, setose. Flagellomere I:  $II=1.5-1.7$ ; length of the petiole = hindtarsomeres  $I+II+0.3\times III$  to  $I+II+0.5\times III$ .

♂: 19 mm. Black, with following red: mandible (except apex), pronotal lobe, pronotal collar dorsally (except small patch anteriorly), fore- and midlegs, hindleg (coxa, trochanter and femur dorsally black), petiole, tergum I (dorsally black), terga II and III (dorsally black) and sterna II-V. Head (except vertex), pronotal lobe, mesopleuron, metapleuron and propodeum laterally covered with appressed silvery setae. Pronotal collar, scutum, scutellum and propodeal enclosure and legs pruinose; erect setae whitish. Clypeus slightly elongate, disk convex. Pronotal collar in lateral view on anterior half slightly concave as in female (Fig. 138). Scutum distinctly transversely striate, scutellum obliquely striate and punctate and propodeal enclosure transversely striate, setose. Genitalia as in *A. rubripes*. Flagellomere I.  $II=1.5$ ; length of petiole = hindtarsomeres  $I+II+0.5\times III$ .

**G e o g r a p h i c a l d i s t r i b u t i o n :** Jordan, Syria, Oman.

### ***Ammophila formosensis* TSUNEKI (Figs 61, 157)**

As *Ammophila subassimilis* TSUNEKI 1967a: 383 (Taiwan), corrected to *Ammophila formosensis* by TSUNEKI 1967b: 18 and 1971: 4.

*Ammophila formosana* TSUNEKI 1967b: 18, ♀, ♂, junior primary homonym of *Ammophila formosana* STRAND 1913. **Holotype:** ♀, Taiwan: Chiayi Prefecture: Fenchihu (originally K. Tsuneki coll., now USNM), examined.

*Ammophila formosensis* TSUNEKI 1971a: 4, substitute name for *Ammophila formosana* TSUNEKI 1967.

**M a t e r i a l e x a m i n e d :** **Holotype** ♀ (USNM); **India:** Kashmir Khatbatse 3000m (1♀ BMNH).

**R e c o g n i t i o n :** *Ammophila formosensis* has the gastral apex with a bluish-black metallic shine and the supra-antennal lamellate projection well developed. The female differs from *A. infesta* in having the clypeus, the frons, the mesopleuron and the propodeum covered with appressed silvery setae and the propodeal enclosure all covered with erect setae (*A. infesta* has only the posterior part of the pronotal lobe and the propodeal enclosure medially covered with appressed silvery setae). It differs from *A. sabulosa* in having a more developed supra-antennal lamellate projection. The male of *A. formosensis* differs from *A. infesta* in having the mesopleuron covered with appressed silvery setae (*A. infesta* has only a small patch along the mesopleural suture covered with appressed silvery setae), and from *A. sabulosa* in having the supra-antennal lamellate projection more developed and the mesopleuron covered with distinct appressed silvery setae.

**D e s c r i p t i o n :** Gastral apex with bluish-black metallic shine, supra-antennal lamellate projection well developed, anterior margin of the mesothoracic venter not

prominent, episternal sulcus extending to anteroventral margin of pleuron, arolia well developed and claws without basal tooth.

♀: 19-22.5 mm. Black except tergum I (except basal third) and gastral segments II and III red (sterna partly darkened). Clypeus (except adjacent to free margin), frons, pronotal lobe, broad band along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae; coxa pruinose, erect setae whitish. Clypeus slightly elongate, with distinct median lobe (Fig. 61), disk convex. Pronotal collar shiny and sparsely punctate (Fig. 157). Scutum medially irregularly, coarsely punctate (punctures 0-1 diameters apart), laterally finely, transversely striate. Scutellum longitudinally ridged and punctate, propodeal enclosure transversely or irregularly ridged and all covered with erect setae. Mesopleuron, metapleuron and propodeum laterally punctato-rugose. Flagellomere I: II=1.4; length of petiole = hindtarsomeres I+0.5×II to I+0.75×II.

♂ (Tsuneki 1967: 18): 16-20 mm. Black, except tergum I (except basally), gastral segment II and tergum III basally, all these terga carrying black streak not completely filling whole length. Petiole slightly longer than tergum I, in some specimens almost equal to hindtarsomere I+II+III or I+II+0.5×III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Taiwan, India (Kashmir).

### ***Ammophila ganquana* YANG & LI (Figs 658-672)**

*Ammophila ganquana* YANG & LI 1989: 105, ♀, ♂. **Holotype:** ♀, China: Shaanxi Province: Ganquan County: Quingquan (Beijing Agricultural University), not examined.

**M a t e r i a l e x a m i n e d :** None.

**D e s c r i p t i o n :** (YANG & LI 1989: 105, translated from Chinese by Yan Chengjin): "♀: Body length 12.5mm. Black; petiole apex ventrally, tergum I largely, tergum II, sternum II, and base of tergum III yellowish red; gastral apex without metallic blue luster; posterior part of tegula and wings pale yellowish brown, veins pale brown. Clypeus, gena and prosternum with sparse long white setae, other areas without long setae. Mesopleuron posteriorly and propodeum posterolaterally covered with dense appressed setae. Gastral petiole basoventrally with sparse pubescence. Vertex, frons and clypeus sparsely punctate, with supra-antennal projection. Clypeus medially with roughly spherical protuberance, free margin of clypeus emarginate medially. Postocellar diameter (ODD): postocellar distance (POD): oculocellar distance (OOD): interocular distance at anterior ocellus (IODP): interocular distance at clypeus (IODC) = 1: 2: 4: 11.1: 9.1. Relative length of antennal pedicel: flagellomeres I: II: III: VIII = 1.7: 5.6: 3.4: 3.3: 2.4. Pronotal collar: length: width = 4.5: 9.5, sparsely punctate, with deep median furrow; transversely, densely finely striate on anterior slope; scutum transversely, densely finely striate and punctate, with admedian line; scutellum coarsely, longitudinally striate; metanotum without distinct striae; propodeal enclosure with inconspicuous median carina, surface obliquely striate laterally; mesopleuron and mesosternal coarsely, transversely rugose-striate and punctate, with episternal sulcus; metapleuron and lateral side of propodeum coarsely rugose-striate. Submarginal cell III of forewing petiolate. Foretarsus asymmetrical; hindleg, relative length of tibia: tarsomeres I: II: III = 22.3: 12.9: 7.5: 5.8, claws simple, with arolia. Length of gastral petiole: tergite I: II = 16: 14.9: 10.9.

♂: Body length 12.0mm. Similar to female. The yellowish red area of tergum III and

sternum III less than in female; wings deeply infumate, veins dark brown. Head and thorax with long, white setae. Clypeus and lower frons covered with dense, appressed setae. Pronotal lobe with pubescence; free margin of clypeus emarginate medially; ODD: POD: OOD: IODP: IODC = 1: 1.9: 3.2: 9.1: 4.7. Relative length of antennal pedicel: flagellomeres I: II: IX = 1.4: 4: 2.8: 3: 1.7. Pronotal collar: length: width = 3.6: 8.1. Scutum without distinct admedian line. Propodeal enclosure without median carina. Hindleg: relative length of tibia: tarsomeres I: II: III = 19.8: 10.5: 5.8: 4.1. Length of gastral petiole: tergite I = 16.1: 14.4. Genitalia with penis valves (as in Figs 670, 671), volsella (as Fig. 672) and gonostyle (as Fig. 669).

**Relationships:** This new species with supra-antennal projection and submarginal cell III petiolate is related to *A. deserticola* TSUNEKI 1971, but the female differs in having white setae on head, shape of clypeus and sculpture of scutum, and the male in the sculpture of the propodeal enclosure and the genitalia. "

**Geographical distribution:** China: Shanxi Province.

### ***Ammophila globifrontalis* LI & YANG (Figs 673-678)**

*Ammophila globifrontalis* LI & YANG 1995: 574, ♀, ♂. **Holotype:** ♀, China: Guangxi Province: Nanning: Forestry Research Institute (Beijing Agricultural University), not examined.

**Material examined:** None.

**Description:** (LI & C. YANG 1995: 574, translated from Chinese by Yan Chengjin): "♀: Body length 17.0-22.0 mm. Black; underside of scape, femora, tibiae largely and tergum I laterally orange or red-brown; base of mandible, midtarsi, hindtarsi and gastral petiole black or brownish-black; foretarsi orange or dark red-brown; head with long, erect, white or pale yellowish brown setae, thorax with long, erect, white setae. Gastral apex black, with weak metallic blue luster. Frons with deep median furrow, upper frons with two large, arched projections, without setae; ocelli small; free margin of clypeus emarginated medially; mandible with three teeth. Postocellar diameter (ODD): postocellar distance (POD): oculocellar distance (OOD): interocular distance at anterior ocellus (IODP): interocular distance at clypeus (IODC) = 1.0: 2.6-2.9: 3.5-4.3: 10.8-12.9: 10.0-11.3. Relative length of antennal pedicel: flagellomere I: II: III: VIII = 1.5-1.6: 6.1-7.1: 3.1-4.0: 3.1-3.9: 2.1. Pronotal collar: length: width = 4.0-4.1: 11.6-12.6, transversely, coarsely striate; scutum with transversely, coarse striae; scutellum coarsely, longitudinally striate; mesopleuron weakly rugose-striate, with short episternal sulcus; metanotum densely longitudinally striate; propodeal enclosure coarsely, obliquely striate laterally, lateral side of propodeum coarsely, rugose-striate and punctate; claws without arolia. Hindleg: relative length of tibia: tarsi I: II = 23.6-27.6: 13.0-15.0: 7.0-8.0. Length of gastral petiole: terga I: II = 19.0-22.0: 19.1-22.0: 13.8-14.1.

♂: Body length 17.0-22.0 mm. Similar to female. Legs or petiole black or brownish-black; underside of tergum I yellowish-brown or red-brown. Mandible with three teeth; ODD: POD: OOD: IODP: IODC = 1.0: 3.0-3.8: 4.0-5.1: 12.0-14.0: 6.4-7.8. Relative length of antennal pedicel: flagellomere I: II: III: IX = 1.6-1.8: 5.2-6.3: 3.2-4.1: 3.1-4.0: 2.0-2.8. Pronotal collar: length: width = 5.3-6.8: 13.8-15.5. Mesopleuron without distinct rugae-striae; claws with arolia; hindleg: relative length of tibia: tarsi I: II: III = 29.5-30.3: 14.6-16.8: 8.0-8.9: 6.0-6.5. Length of gastral petiole: tergite I = 28.5-35.0: 27.3-32.0. Genitalia with penis valves (as Fig. 677) and gonostyle (as in Fig. 678).



**R e l a t i o n s h i p s :** This new species is allied to *A. atripes* SMITH, but can be easily distinguished from it by the characters of the upper frons with two large, arched projections, without setae, rather small ocelli, white setae on the thorax, the coloration of legs and gaster, and the sculpture of the head and thorax as well as the genitalia."

**G e o g r a p h i c a l d i s t r i b u t i o n :** China: Guangxi Province.

***Ammophila gracillima* TASCHENBERG (Figs 48, 88, 95, 123, 130, 143, 160, 233, 284, 321, 480, 538, 588)**

*Ammophila gracillima* TASCHENBERG 1896: 433, ♀. **Lectotype:** ♀, Sudan: Khartum (Halle), designated by MENKE in BOHART & MENKE 1976: 152, examined.

*Ammophila longicollis* KOHL 1884: 379, ♀. **Lectotype:** ♀, Russia: Sarepta, now Krasnoarmeysk near Volgograd (NHMW), examined, **present designation.** Synonymized with *Ammophila gracillima* by ROTH 1928: 188.

*Ammophila debilis* F. MORAWITZ 1889: 125, ♀. **Holotype or syntypes:** ♀, Mongolia: Tsagan Buryuk on Edsin-gol river (ZIN). Synonymized with *Ammophila gracillima* by KOHL 1906: 324, not examined.

*Ammophila philomela* NURSE 1903: 519, ♀. **Syntype:** ♀, India: Gujarat: Deesa (BMNH), examined, **new synonym.**

**Material examined:** 77 ♀♀, 165 ♂♂ (OÖLM), 9 ♀♀, 8 ♂♂ (NHMW), 1 ♀, 1 ♂ (BMNH), 20 ♀♀, 16 ♂♂ (coll. Schmid-Egger).

**Note:** In some specimens of *A. gracillima* 1 r-m crossvein is lost, therefore the forewing has only two submarginal cells. ROTH (1928: 188) mentioned one specimen with a petiolate submarginal cell III. In some specimens of *A. gracillima* the transverse ridges on the pronotal collar are reduced and therefore this species is included twice in the key.

**Recognition:** *Ammophila gracillima* is black and variably red, the gastral apex without a metallic shine and the pronotal collar in most specimens is transversely rugose. The episternal sulcus is ending at the level of the scrobe and the mesothoracic venter is concave anteriorly for the reception of the forecoxa, the depression is margined by a carina that forms one projection on each side. The head, the thorax and the propodeum (including propodeal enclosure) are covered with dense appressed silvery setae. The female of *A. elongata* differs from *A. gracillima* in having a propodeal enclosure covered with appressed silvery setae along midline, laterally coarsely transversely ridged and glabrous and the pronotal collar with wide triangular anteriomedial concavity that intersects the anterior carina (Fig. 131). The female of *A. occipitalis* differs from *A. gracillima* in having the episternal sulcus extending to the anteroventral margin of the pleuron and a propodeal enclosure laterally obliquely, coarsely rugose and glabrous. The female of *A. tekkensis* is similar to *A. gracillima* but differs in having a pronotal collar in all specimens not transversely rugose and the anterior surface of the collar almost vertical (Fig. 144). The male of *A. elongata* differs from *A. gracillima* in having the pronotal collar anteriorly prominent and emarginate (Fig. 319) and the propodeal enclosure only medially covered with appressed silvery setae, laterally glabrous (*A. gracillima* has a pronotal collar anteriorly not emarginate and the propodeal enclosure all covered with appressed silvery setae).

**Description:** Gastral apex without metallic shine, head, thorax, legs, propodeum and gaster variably red. Supra-antennal lamellate projection absent, episternal sulcus ending at level of scrobe, claws without basal tooth. Mesothoracic venter concave

anteriorly for reception of forecoxa, depression margined by carina that forms one projection on each side. Head, thorax and propodeum covered with dense appressed silvery setae; erect setae silvery-white, unusually long on gena, prothorax and female forelegs; wings hyaline.

♀: 16-19 mm. Clypeus not elongate, with nearly straight free margin (Fig. 48), disk nearly flat (Fig. 88, 95). Pronotal collar distinctly elongate and covered by coarse transverse rugae (Figs 130, 160), in some specimens rugae reduced or lacking (Figs 123, 143). Scutum transversely rugose and with deep admedian line. Scutellum and metanotum longitudinally ridged and in most specimens medially with longitudinal furrow. Propodeal enclosure irregularly longitudinally ridged and covered with appressed silvery setae. Arolia small but distinct, spines of foretarsal rake slender. Flagellomere I: II=1.9-2.1; length of petiole = hindtarsomeres I+II to I+II+0.3×III.

♂: 13-18 mm. Clypeus elongate (Fig. 233), disk slightly concave on ventral half and slightly convex on dorsal half. Pronotal collar as long as medially broad, coarsely transversely ridged (ridges reduced in some specimens), anteriorly nearly rectangular (Figs 284, 321). Scutum transversely ridged with distinct admedian line, arolia large. Gonostyle evenly narrowing apically: Fig. 418; penis valve laterally: Fig. 480, ventrally: Fig. 538, apically: Fig. 588. Flagellomere I: II= (1.3)1.8-2.2; length of petiole = hindtarsomeres I+II to I+II+0.5×III.

**Geographical distribution:** North Africa, Sudan, Ethiopia, Arabia, Syria, Israel, India, Central Asia, China.

### ***Ammophila guichardi* DE BEAUMONT (Figs 14, 17, 172, 221, 380, 450, 514, 568)**

*Ammophila guichardi* DE BEAUMONT 1956: 176, ♀, ♂. Holotype: ♀, Libya: n. Tripolitania: Giado (BMNH), examined.

**Material examined:** Holotype ♀, allotype ♂ (BMNH). **Israel:** SW shore of Dead Sea 5 km N Massada 31°23'N 35°20'E (1♂ coll. Schmid-Egger). **Tunisia:** 5 km W Douz 33°29'N 08°59'E (1♀ coll. Schmid-Egger), Gasfa (1♀ coll. Schmid-Egger).

**Recognition:** *Ammophila guichardi* has the gastral apex black without metallic shine and the mesothoracic venter is not prominent anteriorly. Additionally, the episternal sulcus extending to the anteroventral margin of the pleuron. The head, thorax, coxa, trochanters and propodeum laterally are covered with dense, appressed silvery setae that obscure most of the underlying sculpture. The female of *A. guichardi* differs from all Palearctic species in having the outer margin of foretarsomere I with a distinct basal tooth (Fig. 14). The male of *A. guichardi* differs from the similar *A. producticollis* in having a clypeal disk not so convex and a pronotal collar more convex (Fig. 266). The male of *A. induta* differs from *A. guichardi* in having a differently shaped penis valve (Fig. 469).

**Description:** Gaster apex black, without metallic shine, wings hyaline, supra-antennal lamellate projection absent and mesothoracic venter not prominent anteriorly. Episternal sulcus extending to anteroventral margin of pleuron, arolia well developed, claws without basal tooth. Head, thorax, coxae, trochanters and propodeum laterally covered with dense appressed silvery setae that obscure most of underlying sculpture.

♀: 18.5-20 mm. Black, with following yellowish-brown: mandible (except apex), ventral half of clypeus, scape, tegula, legs (except coxae basally and hindfemur basally), petiole and gaster (partly darkened and terga V-VI dorsally dark-brown). Inner margin of

mandible with one subapical tooth. Clypeus elongate and truncate (Fig. 17), disk markedly convex. Pronotal collar elongate (Fig. 172) and slightly punctate, scutum punctate (punctures 0-2 diameters apart). Outer margin of foretarsomere I with distinct basal tooth (Fig. 14), foretarsal rake with slender spines. Propodeal enclosure covered with dense appressed silvery setae along midline, obliquely striate and glabrous laterally. Flagellomere I: II=1.5-1.9; length of petiole = hindtarsomeres I+II+0.5×III.

♂: 19-19.5 mm. Black, with following yellowish-brown: mandible (except apex), clypeus adjacent to free margin, anterior half of scape, fore- and midlegs (except coxa partly), tegula, tergum I (except basally), gastral segments II-IV, terga V-VII dorsally black. Clypeus elongate and truncate (Fig. 221). Gonostyle laterally: Fig. 380; penis valve laterally: Fig. 450, ventrally: Fig. 514, apically: Fig. 568. Flagellomere I: II=1.8; length of petiole = hindtarsomeres I+II+III. The length of the clypeus is slightly variably, therefore this species is included twice in the key.

**G e o g r a p h i c a l   d i s t r i b u t i o n :** Egypt, Saudi Arabia, Israel, Libya, Tunisia.

***Ammophila gusenleitneri* DOLLFUSS nov.sp. (Figs 18, 33, 177, 217, 263, 375, 445, 510, 510)**

**R e c o r d s :** **Holotype:** ♂, Morocco: SW Tiznit Oued Massa, 8. V.2003, leg M. Snizek (OÖLM). **Paratypes:** **Algeria:** Oran, leg. Schmiedeknecht (2 ♀♀, 2 ♂♂ NHMW). **Morocco:** 10 km E Youssoufia, 11. V.1995, leg. Ma. Halada (1 ♀ OÖLM); 40 km S Guercif, 15.-17. V.1995, leg. Ma. Halada (1 ♀ OÖLM); 15 km SE Sefrou, 26.-27. V.1995, leg. Ma. Halada (1 ♀, 1 ♂, OÖLM); 30 km E Midelt, 13. V.1995, leg. Mi. Halada (1 ♀ OÖLM); Hoher Atlas, Tizi-n-Test, 1500-2000m, 23. V.1995, leg. Brechtel (2 ♀♀ coll. Schmid-Egger); Anti-Atlas, Tafraoute N 30-40km, Ait Baha ESE, 30°00'N 9°02'W, 12. III.1997, leg. Blank (1 ♀ coll. Schmid-Egger); 50km NE Taroudant, 5 km östl.-Kreuzung Tizi-n-Test/Aoulouz, 12. IV.1996, leg. O. & M. Niehuis (1 ♀ coll. Schmid-Egger); 11km NW Taliouine, 30°34'N 8°00'W, 15. III.1997, leg. Hauser (1 ♀ coll. Schmid-Egger); 10km E Youssoufia, 11. V.1995, leg. Ma. Halada (2 ♀♀ OÖLM); 10km SE Ait Baha (60km SE Agadir), 30°02'N 9°05'W, 20. IV.1996, leg. J. Gusenleitner (1 ♂ OÖLM); 35km W Taza, 18. V.2003, leg. M. Halada (2 ♂♂ OÖLM); Taroudant env., 11. V.2003, leg. M. Halada (1 ♂ OÖLM); 30km E Taroudant 27. IV.1995, leg. Ma. Halada (1 ♂ OÖLM); 10 km W Tiznit, 6. V.1995, leg. Ma. Halada (1 ♂ OÖLM); Hoher Atlas, Qirgane S Asni, 22. V.1995, leg. Brechtel & Hauser (2 ♂♂ coll. Schmid-Egger); Oujda Col de Jerada, 1000m, 24. III.1990, leg. Miksch (1 ♂ coll. Schmid-Egger). **Tunisia:** E Bizerte Ghar El Melh ~ 10m amsl, 37°10.27'N 10°12.76'E, 26. V.1999, leg. O. & M. Niehuis (1 ♀, 2 ♂♂ coll. Schmid-Egger); 10km N Jendouba, 19. IV.2001, leg. M. Halada (1 ♀, 1 ♂ OÖLM, 1 ♀, 1 ♂ CAS); M'saken, 20.-21. IV.1998, leg. Denes jun. (2 ♀♀ OÖLM); Sousse pr., Friguia 30km SW Hammanet, 14. V.2006, leg. Kressl (1 ♀ OÖLM); Sbeitla, 35°14'N 9°07'E, 12. V.1992, leg. J. Gusenleitner (1 ♂ OÖLM); 10 km SW Le Kef, 15. IV.2001, leg. M. Halada (1 ♂ OÖLM); El Jem, 6.-13. IV.1999, leg. Deneš jun. (1 ♂ OÖLM); Meknassy, 11. IV.1999, leg. Deneš jun. (1 ♂ OÖLM); Bou Hemda, 34°N 09°E, Halbwüste Oase, 23. VIII.1994, leg. Willand (1 ♂ coll. Schmid-Egger); 25km S Bizerte, Lac Ichkeul, Nordufer, 26. VI.1994, leg. Schmid-Egger (1 ♂ coll. Schmid-Egger); W Korba, ~50 m, 36°35.51'N 10°47.02'E, 27. V.1999, leg. O. & M. Niehuis (1 ♂ coll. Schmid-Egger); 5km N El Kef, Trockental, 22. IV.1994, leg. Hauser (1 ♂ coll. Schmid-Egger).

**N a m e   d e r i v a t i o n :** In honor of Mag. Fritz Gusenleitner, the curator of the Hymenoptera collection of "Oberösterreichisches Landesmuseum" Linz, Austria.

**R e c o g n i t i o n :** *Ammophila gusenleitneri* is similar to *A. heydeni* but differs in having a well defined supra-antennal lamellate projection (Fig. 18). It differs from *A. rubripes* in having a well defined supra-antennal lamellate projection, appressed silvery setae forming spots on the pronotal lobe, mesopleuron and propodeum posterolaterally,

and the male in the shape of penis valve (Figs 445, 510, 564) (*A. rubripes* has the appressed silvery setae evenly distributed on the thorax laterally). The female of *A. horni* differs from *A. gusenleitneri* in having the appressed silvery setae evenly distributed on the thorax and propodeum laterally, the supra-antennal lamellate projection absent and the midtibia with two long spurs.

**Description:** ♂: 15-22 mm. Black, with following red: fore- and midlegs (except coxa and trochanter), tegula, tergum I (dorsally black), gastral segments II (dorsally black) and III. Gaster apex black without metallic shine. Clypeus, frons, pronotal lobe, broad band along mesopleural suture, propodeum posterolaterally and mid- and hindcoxa covered with appressed silvery setae; erect setae whitish and wings slightly brownish. Clypeus elongate, medially slightly emarginate (Fig. 217), disk flat. Frons punctate, supra-antennal lamellate projection well developed, vertex dull and sparsely punctate. Pronotal collar dorsally sparsely punctate (punctures 1-2 diameters apart), laterally transversely striate (Fig. 263). Scutum transversely ridged and coarsely punctate, scutellum and metanotum longitudinally ridged and punctate. Propodeum transversely punctato-rugose laterally, propodeal enclosure medially reticulate, irregularly transversely rugose laterally and all covered with erect setae. Mesopleuron and metapleuron punctato-rugose, but metapleuron lacks appressed setae. Mesothoracic venter anteriorly rounded, not prominent, episternal sulcus extending to anteroventral margin of pleuron. Arolia large, claws without basal tooth. Gonostyle laterally: Fig. 375; penis valve laterally: Fig. 445, ventrally: Fig. 510, apically: Fig. 564. Flagellomere I:  $II=1.3-1.5$ ; length of petiole = hindtarsomere I+II to I+II+0.6×III.

♀: 18-22 mm. Black, with following red: fore- and midlegs (except coxae and trochanters), tegula, tergum I (except basally), gastral segments II and III, tergum IV laterally and sternum IV. Gastral apex black without metallic shine, wings slightly brownish. Clypeus (except ventral one third), frons, pronotal lobe, broad band along mesopleural suture, propodeum posterolaterally and mid- and hindcoxae dorsally covered with appressed silvery setae; erect setae pale to white. Clypeus slightly elongate, median lobe with lateral teeth (Fig. 33), disk convex. Frons densely punctate supra-antennal lamellate projection well developed (Fig. 18), vertex dull. Pronotal collar dorsally shiny, sparsely, finely punctate (punctures 1-3 diameters apart), laterally shiny. Scutum transversely ridged and punctate, scutellum longitudinally striate, metanotum irregularly sculptured. Propodeal enclosure reticulate medially, slightly transversely ridged laterally, all covered with erect silvery-white setae. Mesopleuron, metapleuron and propodeum laterally punctato-rugose, metapleuron without appressed setae. Mesothoracic venter anteriorly not prominent, episternal sulcus extending to anteroventral margin of pleuron, arolia distinct, claws without basal tooth. Foretarsomere asymmetrical, foretarsal rake with stiff spines. Flagellomere I:  $II=1.7-2.0$ ; length of petiole = hindtarsomeres I+II.

**Geographical distribution:** Algeria, Morocco, Tunisia.

***Ammophila gussakovskii* DOLLFUSS, new name (Figs 72, 167, 239, 289, 360, 424, 488)**

*Ammophila rugicollis* GUSSAKOVSKIJ 1930: 203, ♀, ♂, junior primary homonym of *Ammophila rugicollis* LEPELETIER DE SAINT FARGEAU 1845: 373 (ZIN). **Syntypes:** ♀, ♂: Azerbaijan: village Karadonly in Arax valley (ZIN), examined.

*Ammophila gussakovskii* DOLLFUSS **new name** for *Ammophila rugicollis* GUSSAKOVSKIJ 1930.

**Material examined:** syntypes ♀, ♂ (ZIN); Kazakhstan: 6 km SE Lepsi (2♂♂ OÖLM), Bakanas district Ili riv. area (1♂ OÖLM). Armenia: Kulp 1901 (1♀ coll. Schmid-Egger).

**Recognition:** *Ammophila gussakovskii* has the gastral apex bluish-black with a metallic shine, the supra-antennal lamellate projection absent, the propodeal enclosure glabrous and the mesothoracic venter not prominent anteriorly. Additionally, the episternal sulcus is extending to the anteroventral margin of the pleuron. Both sexes of *A. gussakovskii* differ from *A. sabulosa* in having the pronotal collar and the scutum distinctly transversely ridged and the propodeal enclosure glabrous (*A. sabulosa* has the pronotal collar not transversely ridged and the propodeal enclosure all covered with erect setae). The female of *A. gussakovskii* differs from *A. terminata* in having the clypeus free margin medially with a small emargination (Fig. 72) and a red petiole, and from *A. terminata turkestanica* in having distinct appressed silvery setae on the mesopleuron and the propodeum posterolaterally (*A. terminata turkestanica* has no appressed silvery setae on the mesopleuron and the propodeum). The male of *A. gussakovskii* differs from the similar *A. terminata* in having the pronotal collar and the scutum more distinctly transversely ridged.

**Description:** Gastral apex bluish-black, with metallic shine, supra-antennal lamellate projection absent, propodeal enclosure glabrous and mesothoracic venter not prominent anteriorly. Episternal sulcus extending to anteroventral margin of pleuron, arolia developed and claws without basal tooth. Erect setae on head dark brown, on remaining areas whitish. Pronotal collar and scutum distinctly transversely ridged, scutellum longitudinally ridged.

♀: 22 mm. Black except petiole, tergum I, gastral segment II and segment III on basal half. Pronotal lobe, patch on mesopleuron, propodeum posterolaterally and hindcoxa dorsally covered with appressed silvery setae. Clypeus slightly elongate with small median emargination on free margin (Fig. 72), disk distinctly convex. Propodeal enclosure transversely striate and glabrous, mesopleuron (including mesothoracic venter) transversely rugose, metapleuron and propodeum laterally irregularly rugose. Pronotal collar: Fig. 167. Flagellomere I: II=2.0; length of petiole = hindtarsomeres I+0.5×II.

♂: 14-20 mm. Black except tergum I, gastral segment II and segment III (basally). Clypeus, frons, pronotal lobe, patch along mesopleuron suture and propodeum posterolaterally covered with appressed silvery setae. Clypeus slightly elongate and slightly emarginated (Fig. 239), disk slightly convex (Fig. 360). Propodeal enclosure obliquely striate and glabrous. Mesopleuron and metapleuron irregularly rugose, mesothoracic venter transversely rugose. Pronotal collar: Fig. 289. Gonostyle laterally: Fig. 424; penis valve laterally: Fig. 488. Flagellomere I: II=1.5; length of petiole = hindtarsomeres I+II+0.5×III.

**Geographical distribution:** Azerbaijan, Kazakhstan, Tajikistan.

### ***Ammophila haimatosoma* KOHL (Figs 422, 483, 542, 592)**

*Ammophila haimatosoma* KOHL 1884: 383, ♀. Holotype: ♀, Cyprus: no specific locality (NHMW), examined.

*Ammophila haimatosoma* variété *sinaïtica* ALFIERI 1946: 128. Holotype: ♀, Egypt: Sinai Peninsula: Wadi El Ghedeirat (A. Alfieri coll., now ?), not examined.

**Material examined:** Holotype ♀ (NHMW), 2♀♀, 10♂♂ (OÖLM), 2♂♂ (BMNH), 4♀♀, 20♂♂ (coll. Schmid-Egger).

**Note:** *Ammophila haimatosoma*, *A. punti*, *A. clavus* and the Subsaharan *A. beniniensis* are extremely similar and variable. Further examinations about their status should be conducted.

**Recognition:** *Ammophila haimatosoma* has the pronotal collar (including lateral lobes) and the scutum with coarse, transverse rugae, the episternal sulcus ending at the level of scrobe and the mesothoracic venter anteriorly not prominent. The gaster is partly black with more or less blue metallic shine and the arolia are lacking in female. Both sexes of *A. punti* differ from *A. haimatosoma* in having a greatly increased amount of stiff setae on the head and thorax and gastral apex without metallic shine. The female of *A. clavus* is similar and differs only in having the head and the thorax in most specimens black. The female of the Subsaharan *A. beniniensis* is similar and differs only in having brown wings with a violet shine and in most specimens the gaster all black. The male of *A. clavus* differs from *A. haimatosoma* in having the legs and the thorax black (*A. haimatosoma* has the prothorax and the legs red).

**Description:** Pronotal collar (including lateral lobes) and scutum with coarse transverse rugae, supra-antennal lamellate projection absent, episternal sulcus ending at level of scrobe, mesothoracic venter not prominent anteriorly. Gaster partly black, with more or less blue metallic shine and claws without basal tooth.

♀: 16.5-22 mm. Black, with following red: head, thorax, propodeum, legs, petiole, tergum I and gastral segment II (all extremely variably). Pronotal lobe and propodeum posterolaterally covered with appressed silvery setae (in some specimens also clypeus), remaining areas of thorax and propodeum more or less pruinose; erect setae on head and thorax dark-brown or pale. Vertex dull and impunctate. Clypeus slightly elongate and evenly arcuate, disk convex. Scutellum and metanotum longitudinally ridged. Mesopleuron, metapleuron and propodeum laterally with uniform oblique ridges. Propodeal enclosure along midline irregularly ridged and pruinose, laterally transversely ridged and glabrous, arolia lacking. Forecoxa with short posteromedian spine (difficult to see, wings slightly yellowish-brown. Flagellomere I: II=1.8-2.1; length of the petiole = hindtarsomeres I+0.75×II to I+II.

♂: 18.5-21 mm. Black, with following variably red: mandible (except apex), clypeus along free margin, scape, prothorax, tegula, legs (partly darkened), petiole, tergum I (except for dorsal black stripe) and basal half of gastral segment II. Gastral apex black, with blue metallic shine, slightly pruinose. Clypeus, frons, pronotal lobe, propodeum posterolaterally covered with appressed silvery setae, thorax and propodeum sides more or less pruinose. Propodeal enclosure transversely rugose, pruinose medially and glabrous laterally. Forecoxa postero medially with spine (difficult to see). Erect setae on head, thorax and propodeum laterally whitish, scutellum coarsely longitudinally ridged. Mesopleuron, metapleuron and propodeum laterally coarsely obliquely punctato-rugose, arolia large. Gonostyle laterally: Fig. 422; penis valve laterally: Fig. 483, ventrally: Fig. 542, apically: Fig. 592. Flagellomere I: II=1.5-1.6; length of petiole = hindtarsomeres I+II to I+II+0.5×III.

**Geographical distribution:** North Africa, Israel, Iraq, Jordan, Iran, Saudi Arabia, Yemen.



***Ammophila haladai* DOLLFUSS nov.sp. (Figs 81, 103, 135, 186, 242, 297, 328, 362, 430, 494, 551, 601)**

**Records:** Holotype: ♂, Turkey: Mut Sertavul, 1300m, 7. VI.1968, leg. J. Gusenleitner (OÖLM).  
Paratypes: Turkey: Sultan Dağları Yalvac env., 5. VII.1997, leg. M. Halada & Jirousek (2♂♂ OÖLM); 50 km S Kars Pasli, 1. VII.1997, leg. M. Halada (1♀, 1♂ OÖLM); Urgup, Capadocia, 13. VI.1998, leg. M. Halada (1♂ OÖLM, 1♂ CAS); 15 km W Refahye, W Erzincan, 1600m, 7. VII.2000, leg. M. Halada (1♂ OÖLM); Bolu, 17 km S Seben, 17. VI.1998, leg. J. Halada (2♀♀ OÖLM); Sile, Konya, 29. VI.2000, leg. Snižek (2♀♀ OÖLM); Gevas / Van Gölü, 29. VI.1993, leg. Deneš (2♀♀ OÖLM, 1♀ CAS); Konya, Sile 25. VI.2000, leg. Snižek (1♀ OÖLM).

**Name derivation:** In honor of the collector Jiří Halada, Czech Republic.

**Recognition:** *Ammophila haladai* is characterized by submarginal cell III petiolate, the propodeal enclosure glabrous and the gastral apex black without a metallic shine. Additionally, the supra-antennal lamellate projection is absent and the episternal sulcus is extending to anteroventral margin of pleuron. The scutum is shiny, distinctly transversely striate and coarsely punctate, the scutellum is longitudinally striate. The female of *A. separanda* differs from *A. haladai* in having a red petiole and the clypeus and the frons covered with dense appressed silvery setae (*A. haladai* has a black petiole and the clypeus and the frons have no dense appressed setae). The female of *A. campestris* differs from *A. haladai* in having a dull, transversely microstriate scutum and the clypeal ventral margin without a distinct median lobe (Fig. 82). The female of *A. pubescens* differs from *A. haladai* in having long erect setae on the petiole ventrally and black frontal setae (*A. haladai* has no erect setae on the petiole ventrally and the erect setae on the frons are pale to white). The male of *A. campestris* differs from *A. haladai* in having a dull, microstriate scutum, and that of *A. separanda* in the shape of the penis valve in lateral and apical view (Figs 493, 550). The male of *A. haladai* differs from *A. rauschi* in having appressed silvery setae on the mesopleuron and the propodeum posterolaterally (*A. rauschi* has the mesopleuron and the propodeum not covered with appressed silvery setae). The male of *A. pubescens* differs from *A. haladai* in having the scutum dull, transversely microstriate and the gaster dorsally black, at least a black stripe on terga I and II.

**Description:** Submarginal cell III petiolate, propodeal enclosure glabrous and gastral apex black without metallic shine. Supra-antennal lamellate projection absent, episternal sulcus extending to anteroventral margin of pleuron. Arolia well developed, claws without basal tooth. Scutum shiny, distinctly transversely striate and coarsely punctate, scutellum longitudinally striate.

♀: 17-19 mm. Black except tergum II (basally black) and gastral segments II and III (posterior half black) red. Pronotal lobe, patch along mesopleural suture, propodeum posterolaterally and mid- and hindcoxa covered with appressed silvery setae; erect setae pale to white. Clypeus slightly elongate, with distinct median lobe (Fig. 81), disk convex, dull and sparsely punctate (Fig. 103). Frons dull, sparsely punctate, vertex dull. Propodeal collar dorsally shiny (Fig. 135), lateral lobes finely transversely striate, coarsely punctate (Fig. 186). Scutum shiny, distinctly transversely striate and coarsely punctate, admedian line well developed. Propodeal enclosure obliquely striate, shiny. Mesopleuron, metapleuron and propodeum laterally reticulate, mesothoracic venter transversely punctato-rugose, not prominent anteriorly. Flagellomere I: II=1.6-1.7; length of petiole = hindtarsomeres I+0.5×II to I+0.75×II.

♂: 14.5-17.0 mm. Black except tergum I and gastral segments II and III red. Clypeus,

frons, pronotal lobe, patch along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae. Pronotal collar and legs pruinose, erect setae silvery-white. Clypeus slightly elongate (fig. 242), disc nearly flat (fig. 362). Frons dull and punctate, vertex dull and sparsely punctate. Pronotal collar dorsally shiny and sparsely punctate (Fig. 328), laterally finely transversely striate (Fig. 297), metanotum irregularly sculptured. Mesopleuron irregularly punctate (punctures 0-2 diameter apart), metapleuron and propodeum laterally punctato-rugose. Propodeal enclosure shiny, obliquely striate, glabrous. Gonostyle laterally: Fig. 430; penis valve laterally: Fig. 494, ventrally: Fig. 551, apically: Fig. 601. Flagellomere I:  $II=1.4-1.5$ ; length of petiole = hindtarsomeres  $I+0.6 \times II$  to  $I+II$ .

**G e o g r a p h i c a l d i s t r i b u t i o n :** Turkey.

***Ammophila hemilauta* KOHL (Figs 27, 173, 205, 340, 398, 460, 578)**

*Ammophila hemilauta* KOHL 1906: 360, ♀. **Lectotype:** ♀, Tunisia: Médenine (NHMW), examined, **present designation.**

**M a t e r i a l e x a m i n e d :** **Lectotype** ♀ (NHMW), 3 ♀ ♀, 3 ♂ ♂ (OÖLM), 4 ♀ ♀, 14 ♂ ♂ (coll. Schmid-Egger).

**R e c o g n i t i o n :** *Ammophila hemilauta* has the episternal sulcus extending to the anteroventral margin of the pleuron and the mesothoracic venter not prominent. The propodeal enclosure has irregular, coarse rugae that become oblique laterally and is covered with sparse appressed silvery setae and white erect setae. The female of *A. hemilauta* differs from *A. albotomentosa* in having the metapleuron without distinct appressed silvery setae (*A. albotomentosa* has the thorax all covered with appressed setae) and in the shape of the clypeus (Fig. 27). The female of *A. laevicollis* differs from *A. hemilauta* only in having the free margin of the clypeus sinuate and without a median emargination. The female of *A. hemilauta* differs from *A. nasuta* in having the free margin of the clypeus with a median emargination (Fig. 27). The male of *A. hemilauta* differs from all males of the *A. nasuta*-group in the shape of the genitalia.

**D e s c r i p t i o n :** Episternal sulcus extending to anteroventral margin of pleuron, mesothoracic venter not prominent, supra-antennal lamellate projection absent, arolia well defined and claws without basal tooth. Propodeal enclosure with irregular coarse rugae that become oblique laterally, covered with sparse appressed silvery setae and white erect setae.

♀: 17-21.5 mm. Black, with following yellowish-brown: mandible (except apex), free margin of clypeus, fore- and midlegs (except coxa), hindtibia (all or basal half), tegula, petiole partly, tergum I (dorsally black) and gastral segments II- IV; segments V and VI black with poor metallic shine. Head (except vertex), thorax (except metapleuron) and propodeum covered with appressed silvery setae; in most specimens appressed setae lack on pronotal collar dorsally, scutum medially and scutellum. Clypeus distinctly elongate, emarginate medially (Fig. 27), disk markedly convex, lower third of clypeal bulge almost inpunctate, shiny and glabrous. Vertex smooth and shiny, also pronotal collar dorsally. Scutum coarsely punctate, shortly transversely ridged, scutellum longitudinally ridged and punctate. Metapleuron densely coarsely punctate, without dense, appressed silvery setae. Pronotal collar laterally: Fig. 173. Flagellomere I:  $II=1.6-2.0$ ; length of petiole = hindtarsomeres  $I+II$  to  $I+II+0.75 \times III$ .

♂: 16-18 mm. Black, with following yellowish-brown: mandible (except apex; in some

specimens all black), tegula, fore- and midlegs (except coxa), basal half of hindtibia, petiole partly, tergum I (except for black dorsal stripe), gastral segments III- VII (in most specimens terga V and VI black dorsally). Head (except vertex), thorax (except metapleuron) and propodeum covered with appressed silvery setae; erect setae whitish. Vertex nearly impunctate. Clypeus distinctly elongate, narrowing ventrally, medially emarginate (Fig. 205), disk in ventral half concave, in dorsal half distinctly convex (Fig. 340). Pronotal collar sparsely punctate, scutum densely, coarsely punctate, scutellum longitudinally ridged and punctate. Labrum with erect spine on apical margin. Gonostlye laterally: Fig. 398; penisvalve laterally: Fig. 460, apically: Fig. 578; sternum VIII emarginate medially. Flagellomere I: II=1.7-2.3; length of petiole = hindtarsomeres I+II to I+II+0.6×III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Egypt, Israel, Libya, Tunisia, Morocco.

***Ammophila heteroclypeola* LI & XUE (Figs 679-687)**

*Ammophila heteroclypeola* LI & XUE 1998: 181, ♀, ♂. Holotype: ♀, China: Xingjiang: Wujiagu (Zheiyang Agricultural University), not examined.

**M a t e r i a l e x a m i n e d :** None.

**D e s c r i p t i o n** (LI & XUE 1998: 181, translated from Chinese by Yan Chengjin): "♀: Bodylength 14.8 -15.1 mm. Black; anterior half of tegula, gastral petiole, terga I-IV and sterna II-IV wholly, tergum V and sternum V partly yellowish red; tibia and tarsi, mandibles and antennae brown to dark brown. Gastral apex black, without steel blue luster; wings pale yellowish brown, veins brown to dark brown. Upper clypeus and lower frons, pronotal lobe, prepeptus, mesopleuron and posterior sides of propodeum covered with dense appressed silvery setae; gena, prothorax except collar above, mesosternum, metapleuron, metasternum, propodeum except propodeal enclosure, coxae and femora of legs with sparse appressed silvery setae; head and thorax with long, erect, white setae. Clypeus densely punctate, disk slightly bulging, free margin with two lateral teeth (Fig. 679). Frons densely punctate, without supra-antennal projection. Vertex sparsely punctate. POD: OOD: IODP: IODC = 22: 30: 96: 72. Relative length of antennal pedicel: flagellomeres I: II: VIII: IX = 13: 48: 30: 28: 18: 17. Pronotal collar (Fig. 684): length: width = 34: 90, shiny, sparsely punctate, with median furrow. Scutum shiny, sparsely punctate, sides of anterior half and medial region of posterior half irregularly, transversely or obliquely rugose-striate. Scutellum shiny, longitudinally rugose-striate and punctate. Metanotum shiny, densely punctate. Mesopleuron with episternal sulcus, other structures covered by dense, appressed silvery setae. Metapleuron coarsely, irregularly rugose-striate. Propodeal enclosure with median carina, its sides irregularly obliquely rugose-striate; lateral area of propodeum coarsely, irregularly rugose-striate. Submarginal cell III petiolate (Fig. 682). Foretarsus with rakes (Fig. 685); hindleg: relative length of tarsomeres I: II: III = 115: 65: 53. Length of gastral petiole: terga I: II = 145: 125: 108.

♂: Body length 15 mm. Similar to female. Terga I-III and sterna II-III wholly, tergum IV and sternum IV partly yellowish red; mandibles, antennae, wing tegulae, legs, gaster except yellowish red area dark reddish brown; wing veins yellowish brown to brown. Free margin of clypeus without tooth (fig. 680). POD: OOD: IODP: IODC = 21: 30: 96: 41. Relativ length of antennal pedicel: flagellomeres I: II: III: VIII: IX = 14: 46: 28: 28: 17: 15. Pronotal collar length: width = 40: 86. Scutum coarsely, densely and obliquely

rugose-striate. Foretarsal rake absent. Hindleg: relative length of tarsomere I: II: III = 110: 59: 58. Length of gastral petiole: terga I: II = 164: 144: 102. Genitalia: gonostyle: Fig. 683, volsella: Fig. 686, and penis valves: Fig. 687.

**R e l a t i o n s h i p s :** This species is closely related to *A. clypeola* YANG & LI 1990. It can be easily distinguished from the latter by the clypeal disk being only slightly bulging, the sculpture and punctures of the scutum, metapleuron and propodeum, the body coloration, appressed silvery setae on clypeus, frons, mesopleuron, metapleuron and lateral area of propodeum, and by the male genitalia."

**G e o g r a p h i c a l d i s t r i b u t i o n :** China (Xingiang).

***Ammophila heydeni* DAHLBOM (Figs 36, 111, 178, 218, 376, 446, 511, 565)**

*Ammophila heydeni* DAHLBOM 1845: 430, sex not indicated. Holotype or syntypes: southern Europe: no specific locality (Lund), not examined.

*Ammophila iberica* Ed. ANDRÉ 1886: 69, ♀, ♂. Syntypes: Portugal: no specific locality (MNHN). Synonymized with *Ammophila heydeni* by KOHL 1889: 20, not examined.

*Ammophila rubra* RADOSZKOVSKI 1876: 132, sex not indicated (authorship attributed to Sichel). Syntypes: Corsica, Caucasus, Egypt, and Kazakhstan (Kraków, ZMMU). Synonymized with *Ammophila heydeni* by KOHL 1906: 367, not examined.

*Ammophila rubriventris* A. COSTA 1864: 111, sex not indicated. Syntypes: France: Corse: no specific locality (NAPOLI). Synonymized with *Ammophila heydeni* by KOHL 1906: 366, not examined.

*Ammophila heydeni* var. *sarda* KOHL 1906: 367, ♀. Lectotype: ♀, Italy: Sardinia: no specific locality (NHMW), examined, **present designation**. Synonymized with *Ammophila heydeni rubriventris* by PAGLIANO 1990: 60.

**M a t e r i a l e x a m i n e d :** 383♂♂, 693♂♂ (OÖLM), 5♀♀, 1♂♂ (BMNH), 3♀♀, 5♂♂ (ZMHU), 48♀♀, 61♂♂ (coll. Schmid-Egger), 2♀♀, 7♂♂ (coll. Jacobs).

**R e c o g n i t i o n :** *Ammophila heydeni* has the gasteral apex black without a metallic shine (in some specimens the gaster is all red and in some males nearly all black), in most specimens not pruinose. The supra-antennal lamellate projection is absent, the mesothoracic venter is not prominent anteriorly. The clypeus, frons, mesopleuron more or less and propodeum posterolaterally are covered with appressed silvery setae. Metapleuron without appressed silvery setae or in some specimens with sparse ones, but in all specimens distinctly sparser than on the mesopleuron. Propodeal enclosure all covered with erect setae. Scutum distinctly transversely ridged and more or less punctate. The female of *A. rubripes* is similar to *A. heydeni* but differs in having a thorax laterally uniformly covered with appressed silvery setae and the gastral apex distinctly pruinose. The female of *A. laevigata* differs from *A. heydeni* in having the propodeal enclosure along midline coarsely reticulate, covered with appressed silvery setae and white erect setae, laterally with coarse transverse rugae and glabrous. In addition, the scutum is smooth and sparsely irregularly punctate (punctures 0-3 diameters apart) and the mesopleuron densely punctate. The female of *A. erminea* differs from *A. heydeni* in having a punctate scutum and the thorax uniformly covered with appressed silvery setae. The female of *A. roborowski* differs from *A. heydeni* in having a punctate scutum and the thorax and propodeum (including propodeal enclosure) uniformly covered with appressed silvery setae. The male of *A. rubripes* is similar to *A. heydeni* but differs in having the mesopleuron, the metapleuron and the propodeum laterally all evenly covered with appressed silvery setae and a characteristically shaped penis valve in apical view (Figs 567). The male of *A. laevigata* differs from *A. heydeni* in having a punctate scutum,

the propodeal enclosure along midline coarsely rugose and covered with appressed silvery setae, laterally transversely ridged and glabrous, and in the shape of the penis valve (Figs 447, 512). The male of *A. erminea* differs from *A. heydeni* in having a punctate scutum and the mesopleuron, the metapleuron and the propodeum laterally all evenly covered with appressed silvery setae.

This common species is extremely variable, and further studies about its status should be conducted.

**Description:** Gasteral apex black, without metallic shine (in some specimens gaster all red, in some males nearly all black), in most specimens not pruinose. Supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia large, claws without basal tooth. Clypeus, frons, pronotal lobe, mesopleuron more or less and propodeum posterolaterally covered with appressed silvery setae. Metapleuron without appressed silvery setae or in some specimens with sparse ones, but in all specimens distinctly sparser than on mesopleuron; erect setae silvery-white. Scutum distinctly transversely ridged and more or less punctate.

♀: 15-22(24) mm. Black, red parts extremely variable: in some specimens mandible (except apex), clypeus adjacent to free margin, tegula, scape, legs and gaster red, in other specimens only fore- and midlegs partly and gaster partly red. Clypeus slightly elongate with more or less distinct median lobe (Fig. 36), disk more or less convex, sparsely punctate. Vertex dull and nearly impunctate, pronotal collar dull, sparsely punctate, dorsally without transverse rugae (Figs 111, 178). Scutellum longitudinally ridged, punctate, propodeal enclosure transversely rugose and all covered with erect silvery-white setae. Mesopleuron transversely punctato-rugose. Flagellomere I: II=1.6-1.8; length of petiole = hindtarsomeres I+II.

♂: 14-20(22) mm. Black, following variably red: legs partly, tegula, terga I-III(IV) (except for dorsal black stripe in most specimens) and sterna II-IV. Clypeus slightly elongate, ventral margin in the most specimens slightly emarginate (Fig. 218), disk nearly flat. Pronotal collar smooth, shiny and sparsely punctate or in some specimens covered with fine appressed silvery setae. Scutellum and metanotum longitudinally ridged. Propodeal enclosure irregularly punctato-rugose, laterally slightly obliquely ridged and all covered with white erect setae. Mesopleuron and metapleuron coarsely punctato-rugose. Gonostyle laterally: Fig. 376; penis valve laterally: Fig. 446, ventrally: Fig. 511, apically: Fig. 565. Flagellomere I: II=1.3-1.6; length of petiole = hindtarsomeres I+II to I+II+III.

**Geographical distribution:** Mediterranean Region, part of central Europe, Central Asia, India, Pakistan, Timor.

### ***Ammophila holosericea* (FABRICIUS) (Figs 29, 175, 267, 382, 452, 516, 570)**

*Sphex holosericeus* FABRICIUS 1793: 205, sex not indicated. **Holotype or syntypes:** "Barbaria" = North Africa (lost). Neotype: ♀, Morocco: 15 km SE Sefrou (OÖLM), **present designation.**

*Ammophila sericea* LEPELETIER DE SAINT FARGEAU & AUDINET-SERVILLE 1828: 453. Synonymized with *Ammophila holosericea* by KOHL 1906: 360.

**Material examined:** neotype ♀ (OÖLM); Algeria: Oran (2♂♂ NHMW). Morocco: 15 km SE Sefrou (2♀♀, 1♂ OÖLM), 10 km NW Sefrou Bhalil (1♀ OÖLM), 30 km E Sefrou El-Menzel (1♂ OÖLM), 40 km S Agadir Qued Massa Sidi Rbat (1♀ coll. Schmid-Egger), Mulay

Idris (1♂ NHMW). Tunisia: Ksar Hadada (1♀ OÖLM), 15 km SW Medenine (1♀ OÖLM), 15 km W Matmata (1♀ OÖLM), Matmata SW Gabes (1♀ coll. Schmid-Egger), 10 km SE Matmata 33°30'N 10°01'E (2♂♂ coll. Schmid-Egger), no specific locality (1♀ NHMW).

J. VAN DER VECHT (1961: 40) examined the types of *Ammophila* in the collection Fabricius and attempted to find the type of *Ammophila holosericea*. He writes the following: "The collection Fabricius contains one female (gaster lacking except for basal part of petiole), which I found to be different from KOHL'S interpretation (1906: 360). Prof. DE BEAUMONT recognized it as a female of *A. heydeni* DAHLBOM, and pointed out that this specimen does not agree with the original description, in which the apex of the abdomen is said to be bluish ("ano cyaneo"); *A. heydeni* has the apex of the abdomen black without metallic shine. This specimen is therefore not to be regarded as the type, and does not provide evidence to consider KOHL'S interpretation incorrect. The true type appears to be lost".

I also think KOHL'S interpretation is right and I have followed it in my key. The holotype is lost and a name bearing type is necessary to define this nominal taxon objectively. Therefore I have designated a neotype: ♀, Morocco: 15 km SE Sefrou, 26.-27. V.1995, leg. Mi. Halada.

**R e c o g n i t i o n :** *Ammophila holosericea* has the gastral apex black with a metallic shine, the mesothoracic venter not prominent anteriorly, the supra-antennal lamellate projection at most slightly developed, as in *A. sabulosa* (Fig. 20). Additionally, the pronotal collar dorsally is punctate and the lateral lobe is transversely striate (in some specimens the pronotal collar dorsally is slightly transversely rugose and punctate). Both sexes of *A. holosericea* are similar to *A. heydeni* but differ in having a gaster apex with metallic shine. Both sexes of *A. holosericea* differ from *A. dubia* and *A. poecilocnemis* in having appressed silvery setae forming distinct spots on pronotal lobe, along the mesopleural suture and on the propodeum posterolaterally and a black petiole (*A. dubia* and *A. poecilocnemis* have a yellowish-brown petiole).

**D e s c r i p t i o n :** Gastral apex black, with metallic shine, episternal sulcus extending to anteroventral margin of pleuron, mesothoracic venter not prominent anteriorly, supra-antennal lamellate projection at most slightly developed, as in *A. sabulosa* (Fig. 20), arolia well developed and claws without basal tooth. Pronotal collar dorsally punctate, pronotum laterally transversely striate (in some specimens pronotal collar dorsally slightly transversely rugose and punctate). Propodeal enclosure coarsely, irregularly rugose and covered with whitish erect setae.

♀: 20-22 mm. Black, with following red: apical half of fore- and midfemora, fore- and midtibiae, tergum I (basally black) and gastral segments II, III. Appressed silvery setae forming spots on clypeus, frons, band along mesopleural suture, pronotal lobe and propodeum posterolaterally; erect setae whitish. Clypeus slightly elongate with distinct median lobe (Fig. 29), disk distinctly convex. Scutum transversely punctato-rugose, scutellum longitudinally punctato-rugose. Pronotal collar laterally: Fig. 175. Flagellomere I: II=1.4-1.8; length of petiole = hindtarsomeres I+0.3×II to I+II.

♂: 19.5-20 mm. Black, with following red: apical half of fore- and midfemora, fore- and midtibiae, tergum I and gastral segments II, III (except for black dorsal stripe). Appressed silvery setae forming spots on clypeus, frons, pronotal lobe, along mesopleural suture and propodeum posterolaterally; erect setae whitish. Scutum coarsely punctato-rugose anteriorly, transversely rugose posteriorly, scutellum coarsely punctate



and longitudinally ridged. Clypeus elongate, medially slightly emarginate, disk slightly convex. Pronotal collar laterally: Fig. 267. Gonostyle laterally: Fig. 382; penis valve laterally: Fig. 452, ventrally: Fig. 516, apically: Fig. 570. Flagellomere I:  $II=1.3-1.5$ ; length of petiole = hindtarsomeres  $I+II$  to  $I+II+0.25\times III$ .

**G e o g r a p h i c a l d i s t r i b u t i o n :** Algeria, Morocco, Tunisia. (Note: Records from Europe probably refer to *A. heydeni*).

***Ammophila honorei* ALFIERI (Figs 104, 189, 246, 301, 365, 413, 500, 556)**

*Ammophila honorei* ALFIERI 1946: 140, ♀. Holotype: ♀, Egypte: Sinai: between el Arish and Hassana (originally *A. Alfieri* coll., now?)

**M a t e r i a l e x a m i n e d :** Jordan: Petra (1♂ OÖLM), Jordan valley S Shuna (1♀ OÖLM). Israel: 32 km SE Beer Sheva 5 km E Yeroham 30°58'N 34°58'E (2♀♀ coll. Schmid-Egger).

**R e c o g n i t i o n :** Body all black and the gaster with a metallic shine. The propodeal enclosure is transversely striate and glabrous, the pronotal collar and the scutum are distinctly transversely striate. Additionally, the supra-antennal lamellate projection is slightly developed, the mesothoracic venter is not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron.

*Ammophila honorei* resembles to *A. terminata* and differs only in having a black gaster. Maybe it is the black form of *A. terminata*.

**D e s c r i p t i o n :** Body all black, gaster with metallic shine. Propodeal enclosure transversely striate and glabrous, pronotal collar and scutum distinctly transversely striate. Scutellum longitudinally striate, supra-antennal lamellate projection slightly developed. Mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia well developed and claws without basal tooth.

♀: 15-19.5 mm. Clypeus, frons, pronotal lobe, spots on propodeum posterolaterally and dorsal surface of mid- and hindcoxa covered with appressed silvery setae; erect setae on head and prothorax dark-brown, on mesothorax and propodeum whitish. Clypeus slightly elongate, with truncate median lobe, disk distinctly convex (Fig. 104). Mesopleuron distinctly transversely striate. Flagellomere I:  $II=1.9$ ; length of petiole = hindtarsomeres  $I+0.75\times II$  to  $I+II$ .

♂: 18 mm. Clypeus, frons, broad patch along mesopleural suture, pronotal lobe, propodeal hindface from hindcoxa to propodeal dorsum and mid- and hindcoxa covered with appressed silvery setae; erect setae on head and prothorax brown, on mesothorax and propodeum laterally white. Clypeus slightly elongate (Fig. 246), clypeal disk nearly flat (Fig. 365). Mesopleuron dull, slightly transversely striate. Pronotal collar laterally: Fig. 301; gonostyle laterally: Fig. 413; penis valve laterally: Fig. 500, ventrally: Fig. 556. Flagellomere I:  $II=1.6$ ; length of petiole = hindtarsomeres  $I+II$ .

**G e o g r a p h i c a l d i s t r i b u t i o n :** Egypt (Sinai Peninsula), Israel, Jordan.

***Ammophila horni* VON SCHULTHESS (Figs 21, 38, 86, 112, 180, 224, 390, 573)**

*Ammophila horni* VON SCHULTHESS 1927: 297, ♂. Holotype: ♂, Sudan: Port Sudan (DEI), examined.

**M a t e r i a l e x a m i n e d :** Holotype ♂ (DEI); Egypt: Gebel Elba (1♀, 3♂♂ NHMW). Oman: 40 km NE Nizwa (1♀ coll. Schmid-Egger).

**R e c o g n i t i o n :** *Ammophila horni* has a gastral apex black, pruinose and without a

metallic shine, the mesothoracic venter is not prominent anteriorly and the episternal sulcus extends to the anteroventral margin of the pleuron. The head, the thorax, the propodeum (including propodeal enclosure) and the hindcoxa are covered with appressed silvery setae that obscure most of the underlying sculpture. The female of *A. horni* is similar to *A. rubripes* but differs in having a clypeal disk not evenly convex (Fig. 86). The female of *A. heydeni* differs from *A. horni* in having the thorax laterally not all covered with appressed silvery setae and the clypeal disk evenly convex in lateral view. The male of *A. horni* differs from all species of the *A. nasuta*-group in having a hypostomal carina with a tooth near the mandibular socket (Fig. 21).

**Description:** Gastral apex black, pruinose and without metallic shine, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly and episternal sulcus extending to anteroventral margin of pleuron. Arolia large, claws without basal tooth. Head, thorax, propodeum (including propodeal enclosure) and hindcoxa covered with appressed silvery setae that obscure most of underlying sculpture; erect setae silvery-white.

♀: 20-21 mm. Black, with following yellowish-brown: mandible (except apex), tegula, legs (except hindcoxa, hindtrochanter and hindtibia dorsally), petiole (darkened dorsally), tergum I, gastral segments II (darkened dorsally), III and sternum IV; wings hyaline. Clypeus elongate (Fig. 38), disk in ventral half obliquely flat and sparsely punctate, distinctly convex in dorsal half (Fig. 86). Pronotal collar sparsely punctate, scutum transversely ridged behind appressed setae, scutellum longitudinally ridged. Propodeal enclosure medially irregularly rugose, laterally transversely ridged, all covered with appressed setae. Flagellomere I:  $II=1.5-1.8$ ; length of petiole = hindtarsomeres  $I+II+0.3\times III$  to  $I+II+0.5\times III$ .

♂: 18-19(20) mm. Black, with following yellowish-brown: mandible (except apex), tegula, legs (hindleg dorsally darkened), petiole (dorsally darkened), tergum I, gastral segments II and III (all except dorsal black stripe) and sternum IV. Ventral margin of clypeus distinctly elongate and truncate (Fig. 224), disk nearly flat ventrally, distinctly convex dorsally (Fig. 332). Hypostomal carina with tooth near mandibular socket (Fig. 21). Sculpture of pronotal collar, scutum, mesopleuron and metapleuron obscured by appressed setae, scutellum longitudinally ridged. Gonostyle laterally: Fig. 390; penis valve apically: Fig. 573. Flagellomere I:  $II=1.5$ ; length of petiole = hindtarsomeres  $I+II+0.5\times III$ .

**Geographical distribution:** Egypt, Oman, Sudan.

***Ammophila hungarica* MOCSÁRY (Figs 52, 90, 126, 148, 228, 280, 351, 388, 474, 532)**

*Ammophila hungarica* MOCSÁRY 1883: 25, ♀. **Holotype or syntypes:** ♀, Hungary: Lipótmező near Budapest (TMB), not examined.

*Ammophila turica* MOCSÁRY 1883: 29, ♂. **Holotype:** ♂, Turkey: Brussa now Bursa (TMB), examined. Synonymized with *Ammophila fallax* by KOHL 1906: 315.

*Ammophila hispanica* MOCSÁRY 1883: 28, ♀. **Holotype or syntypes:** ♀, Spain: Malaga (TMB), not examined. Synonymized with *Ammophila fallax* by KOHL 1889: 2.

*Ammophila fallax* KOHL 1884: 380, ♀, ♂. **Lectotype:** ♀, Turkey: Amasia now Amasya (NHMW), designated by MENKE in BOHART & MENKE 1976: 152, examined. Synonymized with *Ammophila hungarica* by KOHL 1889: 20.

**Material examined:** 147 ♀♀, 54 ♂♂ (OÖLM), 25 ♀♀, 15 ♂♂ (NHMW), 7 ♀♀, 7 ♂♂ (coll. Schmid-Egger).

**R e c o g n i t i o n :** *Ammophila hungarica* is characterized by the apex of the petiole closer to sternum II than to the fore end of tergum I and the gastral apex black without metallic shine. In addition, the episternal sulcus is ending at the level of the scrobe and the claws have a basal tooth (50×) which is evanescent in some specimens. The pronotal collar is dull and the anterior surface is almost vertical, the midtibia is concave posterodorsally and the wings are brown. The female of *A. leclercqi* is similar and differs only by the criteria mentioned in the key. Both sexes of *A. hungarica* differ from *A. sabulosa* in having an episternal sulcus ending at the level of scrobe and in most specimens a short basal tooth on the claws.

**D e s c r i p t i o n :** Apex of petiole closer to sternum II than to fore end of tergum I, gastral apex black, without metallic shine. Episternal sulcus ending at level of scrobe, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, arolia distinct developed and claws with basal tooth (50×), which is evanescent in some specimens. Pronotal collar dull, anterior surface almost vertical. Scutum dull with distinct admedian line and midtibia concave posterodorsally, wings brown.

♀: 14-22 mm. Black except tergum I (except basally), gastral segment II and basal half of segment III red. Clypeus (in most specimens), pronotal lobe, spot before mesopleural suture and propodeum posterolaterally covered with appressed silvery setae; erect setae on head black, on thorax and propodeum white. Clypeal lobe steplike near free margin (Figs 52, 90). Scutellum on anterior half dull and sparsely punctate, posterior half longitudinally striate. Propodeal enclosure obliquely striate, all covered with erect setae. Pronotal collar dorsally: Fig. 126, laterally: Fig. 148. Flagellomere I: II=1.6-1.7; length of petiole = hindtarsomeres I to I+0.5×II.

♂: (12)14-18.5 mm. Black except gastral segment II (dorsally black) and segment III laterally red. Only clypeus and frons covered with appressed silvery setae, erect setae on head black, on thorax and propodeum (including propodeal enclosure) whitish. Clypeus slightly elongate and blunt (Fig. 228), disk nearly flat (Fig. 351). Propodeal enclosure irregularly obliquely or transversely striate and mesopleuron dull and coarsely punctate (punctures 2 diameters apart). Pronotal collar laterally: Fig. 280. Gonostyle laterally: Fig. 388; penis valve laterally: Fig. 474, ventrally: Fig. 532. Flagellomere I: II=1.3-1.6; length of petiole = hindtarsomeres I+0.5×II to I+II.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Central Europe (partly), Italy, France, Greece, Spain, Morocco, Cyprus, Syria, Jordan, Turkey, Armenia, Iran, Central Asia.

### ***Ammophila iliensis* KAZENAS (Figs 631-641)**

*Ammophila tsunekii* KAZENAS 1978: 661, ♀, ♂, junior primary homonym of *Ammophila tsunekii* MENKE 1976. **Holotype:** ♀, Kazakhstan: Ili River Valley 15 km E Ayak-kalkan (ZIN), not examined.

*Ammophila iliensis* KAZENAS 2001: 18. Substitute name for *Ammophila tsunekii* KAZENAS 1978.

**M a t e r i a l e x a m i n e d :** None.

**D e s c r i p t i o n :** (KAZENAS 1978: 661, translated from Russian by H.-J. Jacobs): "♀: Bodylength 16 mm. Clypeus and frons covered with appressed silvery setae which obscure most of underlying sculpture. Ventral (glabrous) part of clypeus with fine dense punctuation on smooth ground. Eyes convergent beneath (Fig. 631), minimal distance at top of clypeus 1.3× smaller than at level of midocellus. Vertex sparsely punctate, indistinctly microscopically reticulate and micropunctate. OOD: POD = 1.3.

Flagellomere I nearly twice as long as II (Fig. 632). Last flagellomere approximately twice as long as apically broad. Pronotal lobe dorsally notched and anteriorly and laterally microsculptured and micropunctate. Scutum nearly all glabrous, laterally more or less covered with appressed setae, with sparse coarse punctures (punctures 3.5-4.0× smaller than midocellus) and indistinctly microscopically reticulate. Scutellum sculptured like scutum, longitudinally ridged posteriorly. Thorax with dense appressed silvery setae that obscure nearly all sculpture. Propodeal enclosure irregularly rugose and punctate, with irregularly distributed silvery setae. Claws without teeth. Petiole nearly as long as tergum I, 1.2× shorter than hindtibia and 1.55× as long as hindtarsomere I. Terga with extremely fine reticulate microsculpture, head and thorax black. Mandible largely, clypeus next to ventral margin and tegula red. Flagellum brown, scape anteriorly reddish, wing veins reddish-brown, red at wing base. Gaster largely red, petiole nearly all, tergum I (dorsally black), tergum VI apically brownish. Legs on most parts red, coxa and hindtrochanter nearly all black.

♂: Bodylength 19 mm. Eyes strongly convergent beneath (Fig. 635), minimal distance at top of clypeus 1.8× shorter than at level of midocellus. OOD: POD = 1.25. Flagellomere I 1.6× longer than flagellomere II and 4× longer than broad on the apex. Last flagellomere truncate apically, 2.2× as long as broad (Fig. 636). Flagellomeres II-XI with tyloids on inner surface. Setae and sculpture as in female, only pronotum and scutum with more abundant setae. Petiole 1.1× as long as tergum I, nearly 1.3× shorter than hindtibia and 1.6× longer than hindtarsomere I. Colouring as in female, only mandible nearly all brown, clypeus black, tergum V dorsally with black spot, terga VI-VII all black. Distinctive for this species are the dense appressed silvery setae that are only present in *A. tomentosa*. *A. iliensis* differs from *A. tomentosa* in having a different coloration and the sculpture of the thorax."

**G e o g r a p h i c a l d i s t r i b u t i o n :** Kazakhstan.

***Ammophila induta* KOHL (Figs 49, 124, 145, 209, 313, 404, 469, 526, 585)**

*Ammophila induta* KOHL 1901: 158, ♀. Lectotype: ♀, Turkmenistan: Repetek (NHMW), examined, **present designation**.

**M a t e r i a l e x a m i n e d :** Lectotype ♀ (NHMW); Kazakhstan: Baigakum Djulek (1♂ NHMW).

**R e c o g n i t i o n :** *Ammophila induta* has the gastral apex without a metallic shine, the pronotal collar and the scutum not transversely ridged, the mesothoracic venter not prominent anteriorly and the arolia large. Additionally, the wings are hyaline, the supra-antennal lamellate projection is absent and the dorsal margin of the gastral socket is attaining the propodeal dorsum or nearly so. The female of *A. induta* is similar to *A. producticollis* but differs in having a propodeal enclosure with dense appressed silvery setae medially, obliquely ridged and glabrous laterally and also large arolia (*A. producticollis* has a propodeal enclosure all covered with appressed silvery setae and small arolia). The female of *A. lativalvis* is similar to *A. induta* but differs in having a mesothoracic venter prominent anteriorly. The female of *A. tekkensis* differs from *A. induta* in having the clypeus not elongate (Fig. 53), a flat clypeal disk and the propodeal enclosure all covered with sparse appressed silvery setae (*A. induta* has a clypeal disk distinctly convex and the propodeal enclosure laterally glabrous). The male of *A. induta* differs from *A. guichardi* in the shape of the gonostyle (Fig. 404) and the penis valve (Fig. 469.)

**Description:** Gastral apex without metallic shine, pronotal collar and scutum not transversely ridged, episternal sulcus extending to anteroventral margin of pleuron, mesothoracic venter not prominent anteriorly, arolia large and claws without basal tooth. Wings hyaline, supra-antennal lamellate projection absent and dorsal margin of gastral socket attaining propodeal dorsum or nearly so.

♀: 17.5 mm. Black, with following yellowish-brown: mandible (except apex), clypeus next to free margin, scape, tegula, legs (nearly all), gaster (partly); petiole dark-brown. Head (except vertex), thorax and propodeum laterally covered with appressed silvery setae. Propodeal enclosure along midline covered with appressed silvery setae, laterally obliquely ridged and glabrous; erect setae white. Clypeus slightly elongate (Fig. 49), disk distinctly convex. Pronotal collar long, but not as long as posteriorly broad (Fig. 145). Admedian line of scutum well defined, broad, scutellum and metanotum slightly prominent but not ridged. Flagellomere I: II=1.6; length of petiole = hindtarsomeres I+II+0.75×III.

♂: 15 mm. Black, with following yellowish-brown: mandible (except apex), scape anteriorly, tegula, legs (except hindcoxa, hindtrochanter and hindfemur dorsally), tergum I (dorsally darkened), gastral segments II-IV (partly darkened). Head (except vertex), thorax and propodeum (including entire propodeal enclosure) covered with appressed silvery setae that obscure most of underlying sculpture; petiole and tergum I distinctly pruinose, erect setae silvery-white. Clypeus distinctly elongate (Fig. 209), disk nearly flat. Pronotal collar nearly as long as posteriorly broad (Fig. 313), propodeal enclosure slightly longitudinally ridged. Mesothoracic venter medially slightly rectangularly prominent, laterally rounded. Gonostyle laterally: Fig. 404; penis valve laterally: Fig. 469, ventrally: Fig. 526, apically: Fig. 585. Flagellomere I: II=1.3; length of petiole = hindtarsomeres I+II.

**Note:** This male cannot be assigned to the female with certainty.

**Geographical distribution:** Turkmenistan, Kazakhstan.

***Ammophila infesta* F. SMITH (Figs 64, 156, 215, 279, 318, 402, 472, 530, 583)**

*Ammophila infesta* F. SMITH 1873: 190, ♀, ♂. Syntypes: Japan: Hyogo (BMNH).

*Ammophila marginalis* PÉREZ 1905: 151, ♀. Holotype or syntypes: ♀, Japan: Yokohama (MNHN). synonymized with *Ammophila sabulosa infesta* by MENKE in BOHART & MENKE 1976: 153.

**Material examined:** 24♀, 9♂ (OÖLM), 10♀, 4♂ (NHMW), 7♀, 17♂ (ZMHU).

**Recognition:** *Ammophila infesta* has the gastral apex black-bluish with a slight metallic shine (in some specimens nearly black), the supra-antennal lamellate projection well developed (higher than the diameter of the midocellus), the mesothoracic venter not prominent anteriorly, the episternal sulcus extending to the anteroventral margin of the pleuron. The female of *A. infesta* is similar to *A. sabulosa* but differs in having a more developed supra-antennal lamellate projection (higher than the diameter of the foreocellus) and the propodeal enclosure covered with erect setae medially, glabrous laterally. Additionally, the scutum and the mesopleuron are smooth or micropunctate, finely and more or less regularly punctate, punctures well defined, never confluent (punctures more than one diameter apart). The female of *A. sickmanni* is similar to *A. infesta* but differs in having the gastral apex without a metallic shine and the scutum

distinctly transversely rugose. The female of *A. formosensis* differs from *A. infesta* in having the clypeus, the frons, the pronotal lobe, the mesopleuron and the propodeum posterolaterally covered with appressed silvery setae and the propodeal enclosure all covered with erect setae (*A. infesta* has only the posterior part of the pronotal lobe covered with appressed silvery setae and the propodeal enclosure laterally glabrous). The female of *A. vagabunda* differs from *A. infesta* in having the scutum and the mesopleuron rugose and coarsely punctate (punctures partly confluent) (*A. infesta* has the scutum smooth or micropunctate, macropunctures well defined, never confluent). The male of *A. infesta* is similar to *A. sickmanni* but differs in having the gastral apex with blue-black slightly metallic shine, the scutum punctate and at most laterally slightly transversely striate (*A. sickmanni* has the gastral apex black and the scutum coarsely, transversely ridged). The male of *A. infesta* is similar to *A. sabulosa* but differs in having the supra-antennal lamellate projection more developed (higher than the diameter of the midocellus) and the propodeal enclosure reticulate and covered with erect setae medially, obliquely ridged and glabrous laterally (*A. sabulosa* has the supra-antennal projection less developed (Fig. 20) and the propodeal enclosure all covered with erect setae).

**Description:** Gastral apex black-bluish with slight metallic shine (in some specimens nearly black), supra-antennal lamellate projection well developed (higher than diameter of midocellus), mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia large and claws without basal tooth.

♀: 20-27 mm. Black except tergum I (partly) and gastral segment II red (in some specimens only segment II red). Posterior part of pronotal lobe covered with appressed silvery setae; erect setae on head dark-brown, those on propodeum white. Clypeus slightly elongate, median lobe laterally delimited by small tooth (Fig. 64), disk distinctly convex. Pronotal collar smooth, impunctate dorsally (Fig. 156). Scutum and mesopleuron smooth or micropunctate, finely and more or less regularly punctate, punctures well defined, not confluent (punctures more than one diameter apart). Scutellum on anterior half smooth and punctate, on posterior half longitudinally striate. Propodeal enclosure obliquely ridged, covered with erect white setae medially, glabrous laterally. Flagellomere I: II=1.6-1.8; length of petiole = hindtarsomeres I+0.5×II.

♂: 17-25 mm. Black, except tergum I and gastral segment II red (both except for black dorsal stripe); in some males tergum I all black. Clypeus, frons, posterior part of pronotal lobe, small patch along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae; erect setae white. Clypeus elongate (Fig. 215), disk nearly flat (Fig. 350); vertex dull, nearly impunctate. Pronotal collar dull, sparsely punctate, scutum dull, irregularly punctate (punctures 0-3 diameters apart), in some specimens laterally slightly, shortly ridged; scutellum longitudinally ridged. Propodeal enclosure along midline reticulate and covered with erect setae, laterally obliquely ridged and glabrous. Mesopleuron distinctly coarsely punctate (punctures 0-2 diameters apart), not transversely rugose. Flagellomere I: II=1.2-1.4; length of petiole = hindtarsomeres I+II.

**Geographical distribution:** China, Japan, Korea, Russian Far East (Primorskiy Krai).

***Ammophila insignis* F. SMITH (Figs 32, 216, 262, 374, 444, 509, 563)**

*Ammophila insignis* F. SMITH 1856: 213, ♀, ♂. **Syntypes:** Gambia: no specific locality (BMNH or OXUM), not examined.



*Ammophila egregia* MOSÁRY 1881: 327, ♀, ♂. **Syntypes**: Lebanon: Beirut (TMB), examined, **new synonym**.

**Material examined**: 7♀♀, 1♂ (OÖLM), 4♀♀, 6♂♂ (NHMW), 1♀, 1♂ (BMNH), 1♂ (coll. Schmid-Egger).

**Recognition**: *Ammophila insignis* is a large species (♀ 26-33mm, ♂ 24-30mm) and has the gastral apex black without a metallic shine, the pronotal collar without transverse rugae, the episternal sulcus extending to the anteroventral margin of the pleuron and the mesothoracic venter not prominent anteriorly. The arolia are well developed and the wings are distinctly yellowish; the erect setae are brownish on the head and forelegs, greyish on the thorax and propodeum. The female of *A. punti* differs from *A. insignis* in having the arolia not developed, the clypeus not elongate (Fig. 69), the pronotal collar transversely ridged and stiff black bristles on the pronotum and mesonotum. The male of *A. horni* shares with *A. insignis* an elongate clypeus but differs in having a tooth on the hypostomal carina near the mandible socket, the shape of gonostyle (Fig. 390) and the penis valve apically (Fig. 573). The male of *A. strumosa* shares with *A. insignis* an elongate clypeus but differs in having a characteristically shaped pronotal collar (Figs 268, 307), gonostyle (Fig. 391) and penis valve (Figs 457, 519).

**Description**: Gastral apex black, without metallic shine, pronotal collar without transverse rugae, episternal sulcus extending to anteroventral margin of pleuron and mesothoracic venter not prominent anteriorly. Arolia well developed, claws without basal tooth and wings distinctly yellowish. Erect setae brownish on head and forelegs, greyish on thorax and propodeum.

♀: 26-33.5 mm. Black, reddish colour extremely variable. In most specimens mandible (except apex), clypeus, scape and flagellomeres (partly), more or less thorax, propodeum, legs and gaster basally red. Clypeus, frons, pronotal lobe and propodeum posterolaterally with silvery-golden pubescence. Clypeus elongate, median lobe truncate, laterally delimited by sharp angle (Fig. 32), disk distinctly convex. Scutum transversely rugose-striate and punctate, scutellum longitudinally striate, punctate. Propodeal enclosure coarsely, irregularly, transversely ridged, and all covered with erect setae. Flagellomere I: II=1.5-1.8; length of petiole = hindtarsomeres I+II to I+II+0.5×III.

♂: 24-30 mm. Black, with following variably red: mandible (except apex), scape and flagellomeres (partly darkened), pronotal lobe (partly), pronotal collar, propleuron partly, petiole, tergum I (except for black dorsal stripe) and gastral segment II. Clypeus elongate, median lobe truncate, delimited by sharp angle (Fig. 216), disk slightly convex. Gastral segments V-VII distinctly pruinose. Pronotal collar laterally: Fig. 262. Gonostyle abruptly narrowed at apical third: Fig. 374; penis valve laterally: Fig. 444, ventrally: Fig. 509, apically: Fig. 563. Flagellomere I: II=1.5; length of petiole = hindtarsomeres I+II+0.75×III. The length of the clypeus is slightly variably, therefore this species is included in the key twice.

**Geographical distribution**: Algeria, Egypt (Sinai Peninsula), Israel, Jordan, Syria, Lebanon, Oman, Saudi Arabia, Yemen.

***Ammophila laevicollis* Ed. ANDRÉ (28, 201, 336, 394, 459, 522, 576)**

*Ammophila laevicollis* Ed. ANDRÉ 1886: 77, ♀. **Syntypes**: Spain, Southern France: no specific locality (MNHN ? could not be found in Paris), not examined.

**Material examined:** 11♀♀, 19♂♂ (OÖLM), 4♀♀, 2♂♂ (NHMW), 1♂ (ZMHU).

**Recognition:** *Ammophila laevicollis* has a gastral apex bluish-black with a slight metallic shine, the pronotal collar without transverse rugae, the supra-antennal lamellate projection absent, the mesothoracic venter not prominent anteriorly, the episternal sulcus extending to the anteroventral margin of the pleuron, the arolia large and the claws without basal tooth. The female is similar to *A. nasuta* and *A. atlantica* but differs in most specimens in having the pronotal collar and the petiole all black. The male of *A. nasuta* is similar to *A. laevicollis* but differs in having no apical tooth on the labrum, the shape of gonostyle laterally (Fig. 458) and the shape of sternum VIII (*A. laevicollis* has an apical tooth on the labrum and differently shaped genitalia).

**Description:** Gastral apex bluish-black, with slight metallic shine, pronotal collar without transverse rugae, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia large and claws without basal tooth.

♀: 16-19.5 mm. Black, with following red: mandible (except apex), tegula, fore- and midlegs (except coxa basally), hindfemur (partly), hindtibia basally, tergum I (except for dorsal black stripe), gastral segments II (black dorsally), III and IV (partly black). Clypeus (except free margin), frons, pronotal lobe, mesopleuron, propodeum posterolaterally and coxa covered with appressed silvery setae; metapleuron nearly glabrous. Propodeal enclosure covered with white erect setae and slightly pruinose. Clypeus distinctly elongate (Fig. 28), free margin shiny and sparsely punctate, clypeal disk distinctly convex. Pronotal collar smooth and shiny dorsally, scutum coarsely, transversely ridged and punctate, scutellum longitudinally ridged and punctate. Propodeal enclosure coarsely reticulate and laterally irregularly obliquely rugose. Mesopleuron punctato-rugose and mesothoracic venter slightly transversely rugose. Flagellomere I: II=1.6-2.0; length of petiole = hindtarsomeres I+0.7×II to I+II+0.3×III.

♂: 15-18.5 mm. Black, with the following red: tegula, foreleg (except coxa), midleg (except coxa and trochanter), hindleg (partly), tergum I, gastral segment II (except for dorsal black stripe) and remaining areas of the gaster (dorsally darkened in most specimens). Clypeus, frons, pronotal lobe, mesopleuron, propodeum (laterally and on posterior surface) and coxa covered with appressed silvery setae; propodeal enclosure all covered with whitish erect setae. Inner margin of mandible with distinct basal tooth; labrum with long apical tooth. Clypeus distinctly elongate and characteristically shaped (Figs 201, 336), pronotal collar shiny, sparsely finely punctate. Scutum coarsely transversely ridged and punctate, anterior part covered with fine appressed setae, scutellum longitudinally striate and propodeal enclosure reticulate. Mesopleuron and propodeum laterally punctato-rugose. Genitalia characteristically shaped: gonostyle laterally: Fig. 394; penis valve laterally: Fig. 459, ventrally: Fig. 522, apically: Fig. 576. Flagellomere I: II=1.6-1.8; length of petiole = hindtarsomeres I+ II to I+II+0.3×III.

**Geographical distribution:** Spain, Portugal, Southern France.

### ***Ammophila laevigata* F. SMITH (Figs 39, 219, 264, 377, 447, 512, 566)**

*Ammophila laevigata* F. SMITH 1856: 215, ♀. **Syntypes:** India: Tamil Nadu: Madras: Gujarat: no specific locality (BMNH), syntype examined.

*Ammophila laevigata* ab. *bicellularis* STRAND 1915: 97, ♂. **Holotype:** ♂, Sri Lanka: Vurelia (DEI), not examined. Synonymized with *Ammophila laevigata* by BOHART & MENKE 1976: 152.

**Material examined:** 20♀, 21♂♂ (OÖLM), 6♀, 3♂♂ (NHMW), 23♀, 22♂♂ (ZMHU), 19♀, 16♂♂ (BMNH).

**Recognition:** *Ammophila laevigata* has a gastral apex black, pruinose and without a metallic shine, the supra-antennal lamellate projection absent, the mesothoracic venter not prominent anteriorly, the episternal sulcus extending to the anteroventral margin of the pleuron, the arolia well developed and the claws without basal tooth. The wings are slightly yellowish-brown. The appressed silvery setae are forming spots on the thorax and propodeum. The female of *A. smithii* differs from *A. laevigata* in having the mesopleuron, the metapleuron and the propodeum laterally evenly covered with appressed silvery setae. The female of *A. erminea* differs from *A. laevigata* in having the mesopleuron, the metapleuron and the propodeum (including propodeal enclosure) evenly covered with appressed silvery setae. The male of *A. smithii* differs from *A. laevigata* in having a penis valve with backward directed acuminate process that is sharply bent outward (Fig. 612). The male of *A. heydeni* differs from *A. laevigata* in having the scutum transversely rugose, the propodeal enclosure all covered with erect setae and a differently shaped penis valve (Figs 446, 511) (*A. laevigata* has the scutum punctate and the propodeal enclosure glabrous laterally). The male of *A. iliensis* differs from *A. laevigata* in having the head and the thorax evenly covered with appressed silvery setae and a differently shaped penis valve (Fig. 641).

**Description:** Gastral apex black, pruinose, without metallic shine, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly and episternal sulcus extending to anteroventral margin of pleuron. Arolia well developed, claws without basal tooth, wings slightly yellowish-brown.

♀: 17-21 mm. Black, with following red: legs (except coxa and trochanter), hindtibia black but in some specimens basal one-fourth red, petiole (in some specimens dorsally black), tergum I (except for black dorsal stripe), gastral segments II and III (basally). Reddish colour of legs variable. Clypeus, frons, pronotal lobe, patch along mesopleural suture, propodeum posterolaterally and hindcoxa (dorsally) covered with appressed silvery setae. Clypeus slightly elongate (Fig. 39), disk dull and nearly flat. Head, pronotum and scutum smooth and shiny or slightly dull, scutum sparsely irregularly punctate (punctures 0-3 diameters apart). Scutellum on anterior half smooth and punctate, on posterior half longitudinally striate. Propodeal enclosure along midline coarsely reticulate, covered with sparse, appressed silvery setae and erect white setae, laterally coarsely, transversely rugose and glabrous. Mesopleuron, metapleuron and propodeum ventrolaterally densely punctate (punctures 0-1 diameter apart). Terga V and VI pruinose. Flagellomere I: II=1.6-1.7; length of petiole = hindtarsomeres I+II.

♂: 17-18 mm. Black, with following red: fore- and midlegs (femora and tibiae in some specimens partly darkened), hindfemur ventrally, petiole, tergum I and gastral segment II (all dorsally black); hindtibia in all specimens black. Clypeus, frons, pronotal lobe, mesopleuron along mesopleural suture, propodeum posterolaterally and coxa dorsally covered with appressed silvery setae. Clypeus elongate (Fig. 219), disk flat. Vertex dull and impunctate, pronotal collar dull, pruinose and also impunctate. Scutum smooth, distinctly punctate (punctures 0-2 diameters apart); scutellum smooth and punctate on anterior half, longitudinally striate on posterior half. Propodeal enclosure along midline coarsely reticulate and covered with white erect setae, laterally glabrous. Mesopleuron, metapleuron and propodeum laterally distinctly punctate (punctures 0-2 diameters apart). Pronotal collar laterally: Fig. 264. Genitalia: penis valve characteristically shaped:

acuminate process directed ventrad: Figs 447, 512, apically: Fig. 566; gonostyle laterally: Fig. 377. Flagellomere I: II=1.4-1.6; length of petiole = hindtarsomeres I+II+0.5×III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** India, Laos, Nepal, Thailand, Vietnam.

***Ammophila lativalvis* GUSSAKOVSKIJ (Figs 24, 46, 87, 118, 141, 210, 274, 314, 345, 405, 466, 609)**

*Ammophila lativalvis* GUSSAKOVSKIJ 1928: 9, ♀, ♂. Syntypes: Uzbekistan: Ak-mechet, Ravat, Khiva area (ZIN), syntypes examined.

**M a t e r i a l e x a m i n e d :** Paratypes: 1♀, 1♂ (ZIN).

**R e c o g n i t i o n :** *Ammophila lativalvis* has a gastral apex reddish or brown without a metallic shine, the mesothoracic venter prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron. The head (except vertex), the thorax and the propodeum laterally are covered with appressed silvery setae. The propodeal enclosure along the midline is covered with appressed silvery setae, laterally glabrous and transversely striate. The wings are hyaline and the erect setae white. The pronotal collar is nearly as long as broad posteriorly (Figs 118, 141, 314) and without transverse rugae, the scutum is coriaceous and like the collar covered with dense appressed silvery setae, the admedian line is ill defined and the scutellum has two longitudinal rugae. The ventral part of the clypeus in the males has two tubercles (Fig. 210). The female of *A. dentigera* differs from *A. lativalvis* in having the forecoxa with an apical acute tooth and the propodeal enclosure all covered with appressed silvery setae. The female of *A. induta* differs from *A. lativalvis* in having the mesothoracic venter not prominent anteriorly and a gaster apex acute as usual. The female of *A. producticollis* differs from *A. lativalvis* in having the mesothoracic venter not prominent anteriorly and the propodeal enclosure all covered with appressed silvery setae. The female of *A. tekkensis* differs from *A. lativalvis* in having the clypeus not elongate (Fig. 53). The male of *A. dentigera* differs from *A. lativalvis* in having no tubercles on the clypeus, an acute tooth on the inner side of the forecoxa, a propodeal enclosure all covered with appressed silvery setae and a differently shaped gonostyle (Fig. 407). The males of *A. induta* and *A. producticollis* differ from *A. lativalvis* in having the mesothoracic venter not prominent anteriorly, the clypeus without tubercles and differently shaped genitalia.

**D e s c r i p t i o n :** Gastral apex reddish or brown, without metallic shine, supra antennal lamellate projection absent, mesothoracic venter prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia well developed and claws without basal tooth. Head (except vertex), thorax and propodeum laterally covered with appressed silvery setae. Propodeal enclosure along midline covered with appressed silvery setae, laterally glabrous and transversely striate. Wings hyaline, erect setae white. Pronotal collar nearly as long as broad posteriorly (Figs 118, 141, 314), without transverse rugae, scutum coriaceous and like collar covered with dense appressed silvery setae, admedian line ill defined, scutellum has two longitudinal rugae.

♀: 13-15 mm. Black, with following yellowish-brown: mandible (except apex), scape, pedicel, flagellomere I basally, tegula, legs, petiole and gaster (except tergum I dorsally). Clypeus elongate (Fig. 46), disk markedly convex (Fig. 87). Apex of gaster truncate (Fig. 24). Flagellomere I: II=1.6; length of petiole = hindtarsomeres I+II+0.75×III.

♂: 14-15 mm. Black, with following yellowish-brown: mandible (except apex), scape apically, clypeus adjacent to free margin, tegula, legs (tarsi darkened), petiole, tergum I

(dorsally darkened) and remaining areas of gaster (partly with dark spots). Ventral part of clypeus with two tubercles (Fig. 210), disk distinctly convex (Fig. 345). Pronotal collar laterally: Fig. 274, dorsally: Fig. 314. Gastral apex and genitalia characteristically shaped: gastral apex laterally: Fig. 609; gonostyle laterally: Fig. 405; penis valve laterally: Fig. 466. Flagellomere I: II=1.8; length of petiole = hindtarsomeres I+II.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Kazakhstan, Uzbekistan.

***Ammophila leclercqi* MENKE (Fig. 55, 91, 149, 197)**

*Ammophila yarrowi* LECLERCQ 1961: 211, ♀, junior primary homonym of *Ammophila yarrowi* CRESSON 1867. Holotype: ♀, Spain: Badajoz Province: Merida (BMNH), examined.

*Ammophila leclercqi* MENKE 1964: 154. Substitute name for *Ammophila yarrowi* LECLERCQ 1961.

**M a t e r i a l e x a m i n e d :** Holotype: ♀ (BMNH).

**R e c o g n i t i o n :** The female of *Ammophila leclercqi* has a gastral apex black without a metallic shine, the supra-antennal lamellate projection absent, the mesothoracic venter not prominent anteriorly and the episternal sulcus ending at the level of scrobe. Additionally, the arolia are well developed and the claws have a distinct basal tooth (50×). The female of *A. leclercqi* is similar to *A. hungarica* but differs in having a short and thick petiole and tergum I.

Maybe this is an abnorme variation of *A. hungarica*.

**D e s c r i p t i o n :** ♀: 17 mm. Black except tergum I (except dorsally), gastral segment II (dorsoapically black) and III (basally) red. Clypeus, pronotal lobe, round patch near mesopleural suture, propodeum posterolaterally and mid- and hindcoxa dorsolaterally covered with appressed silvery setae. Erect setae on head and forelegs black, those on thorax and propodeum white. Clypeus slightly elongate, steplike near free margin (Fig. 55), disk convex (Fig. 91). Pronotal collar dull, without transverse striae, scutum also dull, finely, transversely striate anteriorly, obliquely striate posteriorly, admedian line broad, well developed. Scutellum shiny on anterior half, coarsely punctate, longitudinally ridged and punctate on posterior half. Propodeal enclosure obliquely striate and all covered with erect setae. Mesopleuron dull, sparsely punctate anteriorly, obliquely striate posteriorly. Petiole short and thick (Fig. 197). Pronotal collar laterally: Fig. 149. Flagellomere I: II=1.6; length of petiole = hindtarsomere I.

♂ unknown.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Spain.

***Ammophila menghaiana* LI & YANG (Figs 697-706)**

*Ammophila manghaiana* LI & YANG 1989: 34, ♀, ♂. Holotype: ♀, China: Yunnan Province: Manghai County: no specific locality (Beijing Agricultural University), not examined.

**M a t e r i a l e x a m i n e d :** None.

**D e s c r i p t i o n** (LI & YANG 1989: 34, translated from Chinese by Yan Chengjin): "♀: Body length 19.0 mm. Black; legs largely, terga I-II, and sternum II yellowish red; gastral apex with weak metallic blue luster; wings pale yellowish brown. Head and thorax with long, white setae. Clypeus laterally and lower areas of frons, pronotal lobe, mesopleuron posteriorly and propodeum posterolaterally covered with dense appressed setae, terga I-II with short setae. Vertex with sparsely, small punctures, frons with sparse

large punctures; supra-antennal projection absent; free margin of clypeus emarginate medially, with two lateral teeth. Postocellar diameter (ODD): postocellar distance (POD): oculocellar distance (OOD): interocular distance at anterior ocellus (IODP): interocular distance at clypeus (IODC) = 1: 2.1: 4: 12: 10. Relative length of antennal pedicel: flagellomeres I: II: III: IX = 1.6: 6.1: 4: 4: 2.4. Pronotal collar: length: width = 6: 12, sparsely punctate, without median furrow; scutum sparsely punctate, anterior half without striae, medial region of posterior half rugose-striate. Scutellum weakly longitudinally rugose-striate; metanotum without striae; propodeal enclosure with weak median carina, surface coarsely obliquely rugose-striate laterally, median region without distinct striae; mesopleuron densely punctate, with episternal sulcus, transversely rugose-striate and punctate; mesosternum transversely rugose-striate and punctate. Forewing with three submarginal cells. Foretarsus asymmetrical; hindleg: relative length of tibia: tarsomere I: II: III = 27.8: 14.9: 8: 6.7. Length of gastral petiole: terga I: II = 23.5: 22: 15.5.

♂: Body length 17.0 mm. Similar to female. Terga I-II laterally, sternum II basally yellowish red; clypeus laterally and ventrally covered with dense appressed setae. Free margin of clypeus emarginate medially; ODD: POD: OOD: IODP: IODC = 1: 2.6: 4: 11: 5.7. Relative length of antennal pedicel: flagellomeres I: II: III: IX = 1.4: 5: 3.5: 3.5: 2.4. Pronotal collar: length: width = 5: 10.5. Posterior half of scutum not rugose-striate. Mesosternum weakly transversely rugose-striate; hindleg: relative length of tibia: tarsomere I: II: III = 25.5: 13.5: 7: 5.7. Length of petiole: terga I: II: III = 25: 21.2: 14.6: 8. Genitalia with penis valves as in Fig. 704, volsella as in Fig. 705 and gonostyle as in Fig. 706.

**R e l a t i o n s h i p s :** This new species is related to *A. laevigata* F. SMITH 1856 and *A. punctata* F. SMITH 1856, but it can be easily distinguished from the latter by the punctures of the head, pronotal collar and scutum, the sculpture of scutellum as outlined in the text, black gastral petiole, coloration of the body and by the male genitalia. "

**G e o g r a p h i c a l d i s t r i b u t i o n :** China (Yunnan: Menghai).

***Ammophila menkei* DOLLFUSS nov.sp. (Figs 199, 269, 334, 392, 455, 574)**

**R e c o r d s :** Holotype: ♂, Tunisia: 56 km S Tataouine, 11. IV.1994, leg. J. Gusenleitner (OÖLM).

**N a m e d e r i v a t i o n :** In honor of Dr. Arnold S. Menke, Bisbee, Arizona, USA, an outstanding specialist on Sphecidae.

**R e c o g n i t i o n :** The male of *Ammophila menkei* is characterized by a clypeus distinctly elongate (Fig. 199), the ventral half of the clypeal disk concave and the dorsal half convex (Fig. 334). Additionally, the inner margin of the mandible has a basal tooth and the genitalia are characteristically shaped (Figs 392, 455, 574). The males of *A. horni* and *A. strumosa* share with *A. menkei* the elongate and anteriorly truncate clypeus, but differ conspicuously in having a differently shaped penis valve and gonostyle. The male of *A. insignis* differs from *A. menkei* in having the mesopleuron without dense appressed silvery setae, the scutum distinctly transversely ridged and differently shaped genitalia (*A. menkei* has the mesopleuron with appressed silvery setae and the scutum punctate). The male of *A. guichardi* differs from *A. menkei* in having the clypeal disk all convex and differently shaped genitalia.

**D e s c r i p t i o n :** ♂: 18.5 mm. Black, with following yellowish-brown: mandible



(except apex), scape ventrally, tegula, fore- and midlegs (except coxae), hindfemur (dorsally black), hindtibia (apically darkened), petiole, tergum I (dorsally black) and gastral segments II-IV. Apical terga black, without metallic shine, wings hyaline. Head (except vertex), thorax and propodeum laterally covered with appressed silvery setae; erect setae whitish. Inner margin of mandible with subapical tooth and short basal tooth; supra-antennal lamellate projection absent. Clypeus elongate, truncate apically (Fig. 199), disk concave on ventral half, distinctly convex on dorsal half (Fig. 334). Pronotal collar sparsely punctate dorsally, scutum distinctly punctate, admedian line poorly developed; scutellum longitudinally striate and punctate. Mesopleuron, metapleuron and propodeum laterally covered with appressed silvery setae that obscure underlying sculpture. Propodeal enclosure irregularly transversely ridged, sparsely covered with appressed setae and silvery-white erect setae. Episternal sulcus extending to anteroventral margin of pleuron, mesothoracic venter anteriorly not prominent, arolia well developed, claws without basal tooth. Gonostyle laterally: Fig. 392; penis valve laterally: Fig. 455, apically: Fig. 574. Flagellomere I: II=1.4; length of petiole = hindtarsomeres I+II+0.3×III.

♀: unknown.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Tunisia.

***Anmophila meridionalis* KAZENAS (Figs 222, 265, 379, 449)**

*Anmophila meridionalis* KAZENAS 1980: 49, ♂. Holotype: ♂. Tajikistan: 10 km NE Garavuty on Vakhsh River (ZIN), photograph examined.

**M a t e r i a l e x a m i n e d :** photograph of Holotype: ♂ (ZIN).

**R e c o g n i t i o n :** The male of *A. meridionalis* has a gastral apex black without metallic shine, the supra-antennal lamellate projection absent and the episternal sulcus probably extending to the anteroventral margin of the pleuron (covered with appressed setae on the type). Additionally, the mesothoracic venter is not prominent anteriorly, the arolia are well developed and the claws without basal tooth.

**D e s c r i p t i o n :** ♂: Black, with following red: mandible (except apex), fore- and midlegs, hindleg (partly black), tergum I (except black dorsal strip), tergum II (except small black spot basally), tergum III and sterna II-IV; in some specimens petiole partly red. Head (except vertex), thorax and propodeum laterally covered with dense, appressed, silvery setae that obscure underlying sculpture and long erect white setae; legs partly covered with fine, appressed setae. Clypeus elongate (Fig. 222), dorsal surface of pronotal collar sparsely punctate. Scutum punctate (punctures one diameter apart), scutellum and metanotum punctate. Propodeal enclosure along midline coarsely rugose, covered with appressed silvery setae and also with white erect setae, laterally transversely ridged and glabrous. Mesopleuron, metapleuron and propodeum densely punctate. Collare laterally: Fig. 265; gonostyle laterally: Fig. 379; penis valve laterally: Fig. 449. Flagellomere I: II= 2.0 (?); length of petiole = hindtarsomeres I+II+0.3×III.

♀: unknown.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Tajikistan.

***Ammophila mitlaensis* ALFIERI (Figs 58, 92, 151, 247, 302, 434, 501, 557, 604)**

*Ammophila mitlaensis* ALFIERI 1961: 139, ♀, Holotype: ♀, Egypt: Sinai: Wadi Mitla (USNM), examined.

**M a t e r i a l e x a m i n e d :** 1♀, Holotype (USNM); Israel: Zin Wilderness Nakhall Zin at En Akrabim (1♀ OÖLM, 1♂ coll. Schmid-Egger), Arana valley Iddan wadi 30°48.93'N 35°16.79'E (1♂ OÖLM, 2♀ ♀, 3♂ ♂ coll. Schmid-Egger).

**R e c o g n i t i o n :** *Ammophila mitlaensis* has the gastral apex black without metallic shine, the supra-antennal lamellate projection absent and the episternal sulcus extending to the anteroventral margin of the pleuron. Additionally, the mesothoracic venter is not prominent anteriorly, the arolia are well developed and the claws without basal tooth. The female of *A. mitlaensis* differs from *A. brevipennis* in having the clypeal free margin with a distinct median lobe laterally delimited by teeth and whitish erect setae (*A. brevipennis* has the free margin of the clypeus rounded, without median lobe and black erect setae). Both sexes of *A. mitlaensis* differs from *A. modesta* in having a red petiole (*A. modesta* has a black petiole). The female of *A. assimilis* differs from *A. mitlaensis* in having a black petiole and a scutum shiny, punctate and laterally transversely striate. The male of *A. altigena* differs from *A. mitlaensis* in having a black petiole, the mesopleuron without distinct appressed silvery setae and terga I and II dorsally without a black stripe. The male of *A. assimilis* differs from *A. mitlaensis* in having a black petiole and a scutum shiny and transversely striate.

**D e s c r i p t i o n :** Gasteral apex black, without metallic shine, supra-antennal lamellate projection absent, episternal sulcus extending to anteroventral margin of pleuron, mesothoracic venter not prominent anteriorly, arolia well developed and claws without basal tooth.

♀: (13)17-18 mm. Black, with following red: petiole, tergum I, gastral segment II, and basal half of segment III; in some specimens these all dorsally black. Clypeus (except ventral one third), frons, pronotal lobe, mesopleuron along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae; erect setae silvery-white. Clypeus slightly elongate, median lobe laterally delimited by distinct tooth (Fig. 58), disk convex (Fig. 92). Pronotal collar (Fig. 151) dorsally sparsely punctate, pronotum laterally transversely striate, scutum transversely striate and punctate. Anterior half of scutellum shiny and punctate, posterior half longitudinally striate, in some specimens scutellum all longitudinally striate. Propodeal enclosure along midline reticulate, covered with erect setae, laterally obliquely ridged and glabrous. Mesopleuron and metapleuron punctato-rugose, metapleuron without appressed silvery setae. Flagellomere I: II=1.5-1.6; length of petiole = hindtarsomeres I+0.75×II to I+II.

♂ (hitherto unknown): 13-15 mm. Black, with following red: petiole, tergum I, gastral segment II (both with black stripe dorsally) and basal half of segment III. Clypeus, frons, pronotal lobe, mesopleuron, propodeum posterolaterally and coxa dorsally covered with appressed silvery setae; erect setae white. Clypeus elongate and emarginate (Fig. 247), disk flat. Vertex nearly impunctate, dull, pronotal collar dull, scutum dull and distinctly but finely transversely striate, scutellum on anterior one-third smooth, on posterior two-thirds longitudinally striate. Mesopleuron, metapleuron and propodeum laterally punctato-rugose. Propodeal enclosure along midline irregularly rugose and covered with erect setae, laterally with small stripe transversely striate and glabrous. Pronotal collar laterally: Fig. 302. Gonostyle laterally: Fig. 434; penis valve laterally: Fig. 501,

ventrally: Fig. 557, apically: Fig. 604. Flagellomere I:  $II=1.4-1.6$ ; length of petiole = hindtarsomeres  $I+II+0.25\times III$ .

**G e o g r a p h i c a l d i s t r i b u t i o n :** Egypt (Sinai Peninsula), Israel.

***Ammophila modesta* MOCSÁRY (Figs 59, 93, 153, 230, 353, 414, 476, 534)**

*Ammophila modesta* MOCSÁRY 1883: 28, ♀. **Holotype:** ♀, Spain: Granada (TMB), examined.

**M a t e r i a l e x a m i n e d :** **Holotype** ♀ (TMB), 4♀♀, 15♂♂ (OÖLM), 2♂♂ (NHMW).

**R e c o g n i t i o n :** *Ammophila modesta* has the gastral apex black without metallic shine, the pronotal collar not transversely striate, the episternal sulcus extending to the anteroventral margin of the pleuron and the mesothoracic venter not prominent anteriorly. Additionally, the supra-antennal lamellate projection is absent, and the propodeal enclosure is all covered with erect setae. The clypeus, the frons, the pronotal lobe, a broad band along mesopleural suture and the propodeum posterolaterally are covered with appressed silvery setae. The petiole is black. Both sexes of *A. terminata* differ from *A. modesta* in having a glabrous propodeal enclosure and the gastral apex with metallic shine. The female of *A. sabulosa* differs from *A. modesta* in having no appressed silvery setae on the clypeus and the frons and a blue-black gastral apex with metallic shine. Both sexes of *A. assimilis* differ from *A. modesta* in having the pronotal collar dorsally smooth and shiny, with coarse, sparse punctures and a shiny scutum, coarsely punctate and laterally transversely striate (*A. modesta* has the pronotal collar dorsally dull and coriaceous, and the scutum is dull, coriaceous and transversely microstriate). Both sexes of *A. mitlaensis* differ from *A. modesta* only in having a red petiole. The male of *A. sabulosa* differs from *A. modesta* in having the gastral apex with metallic shine and the mesopleuron without a distinct patch of appressed silvery setae.

**D e s c r i p t i o n :** Gastral apex black, without metallic shine, pronotal collar not transversely striate, episternal sulcus extending to anteroventral margin of pleuron and mesothoracic venter not prominent anteriorly. Supra-antennal lamellate projection absent, arolia distinct developed and claws without basal tooth.

♀: 15-19.5 mm. Black except tergum I and gastral segments II-IV red; in some specimens tergum I basally and tergum IV dorsally black. Clypeus, frons, pronotal lobe, broad band along mesopleural suture, propodeum posterolaterally and coxa covered with appressed silvery setae; erect setae whitish-grey. Clypeus slightly elongate (Fig. 59), disk convex (Fig. 93). Pronotal collar dorsally dull and coriaceous, scutum dull, coriaceous, sparsely punctate and transversely microstriate, scutellum longitudinally striate. Propodeal enclosure coarsely obliquely punctato-rugose and covered with erect setae, mesopleuron coriaceous and punctate. Pronotal collar laterally: Fig. 153. Flagellomere I:  $II=1.5-1.8$ ; length of petiole = hindtarsomeres  $I+0.5\times II$  to  $I+0.75\times II$ .

♂: 13-19 mm. Black, except tergum I and gastral segments II-IV (V) red, all with black dorsal stripe. Clypeus, frons, pronotal lobe, mesopleuron and propodeum posterolaterally covered with appressed silvery setae; in most specimens pronotal collar, scutum and coxa covered with fine, short appressed silvery setae; erect setae whitish-grey. Clypeus elongate, narrowed and distinctly emarginate (Fig. 230), disk nearly flat (Fig. 353). Pronotal collar dorsally dull, coriaceous and sparsely punctate, scutum dull, coriaceous, punctate and transversely microstriate, scutellum coarsely longitudinally punctato-rugose. Propodeal enclosure obliquely punctato-rugose, covered with erect setae and

mesopleuron coriaceous and coarsely punctate (punctures 0-1 diameter apart). Gonostyle laterally: Fig. 414; penis valve laterally: Fig. 476, ventrally: Fig. 534. Flagellomere I: II=1.5-1.6; length of petiole = hindtarsomeres I+II to I+II+0.3×III.

**Geographical distribution:** Portugal, Spain, France (Pyrénées-Orientales: Banyuls-sur-Mer).

***Ammophila mongolensis* TSUNEKI (Figs 294, 428)**

*Ammophila mongolensis* TSUNEKI 1971: 163, ♀, ♂. Holotype: ♂, Mongolia: Central Aymag: 3 km E Somon Nalajah (TMB), examined.

**Material examined:** Holotype ♂ (TMB), 55 ♀♀, 54 ♂♂ (OÖLM), 1 ♀, 1 ♂ (BMNH), 2 ♀♀, 2 ♂♂ (coll. Jacobs). 7 ♂♂ (NHMW).

**Recognition:** *Ammophila mongolensis* has the submarginal cell III petiolate, the gastral apex black without metallic shine, the propodeal enclosure glabrous and the supra-antennal lamellate projection absent. Additionally, the mesothoracic venter is not prominent anteriorly, the episternal sulcus is extending to the anteroventral margin of the pleuron. The female of *A. campestris* is similar to *A. mongolensis* but differs in having the relation of flagellomere I: II = 1.5-1.7, in all specimens a distinct patch of appressed silvery setae on the mesopleuron and the propodeal enclosure shiny (*A. mongolensis* has the relation of flagellomere I: II = 1.8-2.1, only in some specimens a small patch of appressed silvery setae on the mesopleuron and in most specimens the propodeal enclosure is dull). The female of *A. pubescens* differs from *A. mongolensis* in having the petiole with distinct erect setae ventrally (*A. mongolensis* has no erect setae on the petiole ventrally). The male of *A. pubescens* is similar to *A. mongolensis* but differs in having a dorsal black stripe on terga I and II and in the shape of gonostyle. The male of *A. campestris* is similar to *A. mongolensis* but differs in having a differently shaped gonostyle.

**Description:** Submarginal cell III petiolate, gastral apex black, without metallic shine, propodeal enclosure glabrous, supra-antennal lamellate projection absent. Mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia well defined, claws without basal tooth.

♀: 13-16.5. Black except tergum I, gastral segment II and basal half of III red; in some specimens petiole and gastral segments III and IV red. Propodeum posterolaterally and dorsal stripe on hindcoxa and in some specimens small patch on mesopleuron covered with appressed silvery setae; head and prothorax with black erect setae, remaining areas with white ones. Clypeus slightly elongate, ventrally arcuate or with truncate median lobe, disk distinctly convex. Pronotal collar shiny dorsally, lateral lobes finely, transversely striate, scutum dull or shiny, coarsely sparsely punctate and transversely finely striate, scutellum longitudinally striate and punctate. Propodeal enclosure finely, obliquely striate and in most specimens dull. Mesopleuron dull, sparsely punctate; metapleuron and propodeum laterally obliquely punctato-rugose. Flagellomere I: II=1.8-2.1; length of petiole = hindtarsomeres I+0.25×II to I+0.5×II.

♂: 13.5-17 mm. Black except tergum I, gastral segment II and basal half of III red, in some specimens also petiole. Clypeus, frons and propodeum posterolaterally covered with appressed silvery setae. Erect setae on head darkbrown, on thorax and propodeum white. Clypeus slightly elongate and truncate, disk nearly flat. Pronotal collar shiny or dull dorsally, pronotum laterally finely striate. Scutum dull, coarsely punctate and finely

transversely striate or rugose, admedian line distinctly developed, scutellum dull, longitudinally striate and coarsely punctate. Propodeal enclosure dull, obliquely striate or irregularly reticulate. Mesopleuron dull, coarsely punctate, metapleuron and propodeum laterally obliquely punctato-rugose. Pronotal collar laterally: Fig. 294. Gonostyle characteristically shaped: setae on ventral margin of apex nearly as long as those on dorsal margin: Fig. 428. Flagellomere I: II= 1.4-2.0; length of petiole = hindtarsomeres I+0.5×II to I+II.

**Geographical distribution:** Armenia, central-Turkey, Mongolia, Kazakhstan, Kyrgyzstan, Tajikistan. Apparently a montaneous species (-3600m).

***Ammophila nasuta* LEPELETIER DE SAINT FARGEAU (Figs 110, 174, 200, 393, 458, 520, 575)**

*Ammophila nasuta* LEPELETIER DE SAINT FARGEAU 1845: 380, ♀, ♂. **Lectotype:** ♀, Algeria: Oran (Turin), designated by MENKE in BOHART & MENKE 1976: 152, photograph examined.

**Material examined:** photograph of lectotype ♀ (Turin), 9♀♀, 9♂♂ (MNH), 1♀ (OÖLM), 1♀, 2♂♂ (BMNH).

**Recognition:** *Ammophila nasuta* has the gastral apex with metallic shine, the supra-antennal lamellate projection slightly developed, the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron. The females of *A. laevicollis* and *A. atlantica* are similar, I can not clearly separate them. The male of *A. laevicollis* is similar to *A. nasuta* but differs in having the labrum with an erect tooth anteriorly, the inner margin of the mandible with a long basal tooth and differently shaped gonostyle (Fig. 394) and penis valve (Figs 459, 522, 576) (*A. nasuta* has the labrum without a tooth anteriorly, the inner margin of the mandible with a short basal tooth and differently shaped genitalia). The male of *A. nasuta* is similar to *A. atlantica* but differs in having a distinct tubercle and no emargination on the free margin of the clypeus (*A. atlantica* has an emargination on the free margin of the clypeus and no tubercle).

**Description:** Gaster apex with metallic shine, supra-antennal lamellate projection slightly developed, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia large and claws without basal tooth.

♀: 20-22.5 mm. Black, with following red: mandible (except apex), anterior half of scape, pronotal collar (in some specimens black), pronotal lobe, tegula, fore- and midlegs (except coxae), hindleg (partly black), petiole (in some specimens black), tergum I (except basally), and gastral segments II-IV (with dark spots ventrally). Clypeus (except ventral third), frons, broad band along mesopleural suture, broad band dorsolaterally on propodeum and hindcoxa dorsally covered with appressed silvery setae; erect setae silvery-white. Clypeus distinctly elongate, ventral third glabrous and sparsely punctate, disk distinctly convex. Pronotal collar shiny and sparsely punctate, anterior surface almost vertical (Figs 110, 174). Scutum transversely striate, coarsely punctate and scutellum longitudinally striate and punctate. Propodeal enclosure coarsely reticulate and covered with erect setae. Mesopleuron and metapleuron punctato-rugose, metapleuron without appressed silvery setae. Flagellomere I: II=1.7-2.0; length of petiole = hindtarsomere I+II.

♂: 15-20 mm. Black, with following red: mandible (except apex), anterior half of scape,

tegula, pronotal collar (in some specimens with black spots or all black), pronotal lobe, fore- and midlegs, hindleg (except trochanter and apical two-third of tibia), petiole (dorsally black), tergum I and gastral segments III-V (except for black dorsal stripe). Clypeus, frons, pronotal lobe posteriorly, scutum anteriorly, broad band along mesopleural suture, broad band dorsolaterally on propodeum and hindcoxa covered with appressed silvery setae; erect setae silvery-white. Inner margin of mandible with one subapical tooth and short basal tooth. Clypeus distinctly elongate, ventrally with tubercle (Fig. 200), disk in lateral view on ventral half concave, on dorsal half convex (Fig. 335). Labrum without tooth anteriorly, pronotal collar dorsally punctate (punctures 0-1 diameter apart). Scutum coarsely punctato-rugose, on posterior half more transversely rugose, scutellum longitudinally striate and punctate. Propodeal enclosure reticulate, shiny, covered with erect silvery-white setae. Mesopleuron and metapleuron punctato-rugose, metapleuron without appressed silvery setae. Sternum VIII distinctly emarginate. Genitalia characteristically shaped: gonostyle laterally: Fig. 393, penis valve laterally: Fig. 458, ventrally: Fig. 520, apically: Fig. 575. Flagellomere I: II=1.7-2.0; length of petiole = hindtarsomere I+II to I+II+0.5×III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** North Africa.

***Ammophila nigrina* F. MORAWITZ**

*Ammophila nigrina* F. MORAWITZ 1889: 128, ♀. Holotype: ♀, China: Gansu: Sigu (ZIN), photograph examined, **resurrected status**. Regarded as synonym of *A. campestris* by KOHL 1906: 320 and subsequent authors.

**M a t e r i a l e x a m i n e d :** photograph of holotype ♀ (ZIN).

**R e c o g n i t i o n :** The female of *Ammophila nigrina* is all black (unlike all other species with a petiolate submarginal cell III) and has the submarginal cell III petiolate, a glabrous propodeal enclosure and the gastral apex without metallic shine. Additionally, the supra-antennal lamellate projection is absent and the mesothoracic venter is not prominent anteriorly.

**D e s c r i p t i o n :** Body all black, without metallic shine; submarginal cell III petiolate. Propodeal enclosure glabrous, supra-antennal lamellate projection absent, mesothoracic venter anteriorly not prominent. Episternal sulcus extending to anteroventral margin of pleuron, arolia well developed and claws without basal tooth.

♀: 20 mm. Patch along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae. Clypeal median lobe truncate, pronotal collar dorsally coriaceous, with slight shallow depression on the posterior margin. Scutum laterally delicately, densely striate with ill-defined medial furrow, scutellum longitudinally striate, propodeal enclosure obliquely striate and glabrous.

♂: Unknown.

**G e o g r a p h i c a l d i s t r i b u t i o n :** China (Gansu Province).

***Ammophila obliquetriolae* YANG & LI (Figs 688-696)**

*Ammophila obliquetriolae* YANG & LI 1989: 106, ♂. Holotype: ♂, China: Shaanxi Province: Gangquan County: Quingquan (Beijing Agricultural University), not examined.

**D e s c r i p t i o n :** (YANG & LI 1989: 106), translated from Chinese by Yan Chengjin): "♂: Body length 15.0 mm. Black; petiole apex ventrally, tergum I largely, tergum II, sternum II, base of tergum III and sternum III yellowish red; gastral apex



without metallic blue luster; posterior part of tegula and wings pale yellowish brown, veins brown. Gena and prosternum with long, white setae, other areas with sparse short setae. Clypeus and lower areas of frons, mesopleuron posteriorly and propodeum posterolaterally covered with dense appressed setae. Pronotal lobe with pubescence, gastral petiole ventrally without pubescence. Vertex and frons sparsely punctate, with supra-antennal projection. Free margin of clypeus emarginate medially. Postocellar diameter (ODD): postocellar distance (POD): oculocellar distance (OOD): interocular distance at anterior ocellus (IODP): interocular distance at clypeus (IODC) = 1: 2: 3.1: 9: 5. Relative length of antennal pedicel: flagellomere I: II = 1.5: 4.7: 3. Pronotal collar: length: width = 4.5: 9, sparsely punctate, with deep median furrow; transversely, densely, finely striate on anterior slope; scutum with short admedian line, sides of anterior half and posterior half transversely, densely, finely striate and punctate; scutellum longitudinally striate; metanotum coarsely, longitudinally rugose-striate; propodeal enclosure with weak median carina, surface obliquely striae coarser than on scutellum; mesopleuron and mesosternum weakly transversely rugose-striate and punctate, episternal sulcus present; metapleuron and lateral side of propodeum coarsely rugose-striate and punctate. Submarginal cell III petiolate. Claws simple, arolia present. Hindleg: relative length of tibia: tarsomeres I: II: III = 22: 11.8: 6.5: 5. Length of gastral petiole: tergite I: II: III = 18: 16.4: 11: 6.4. Genitalia with penis valves as in Fig. 694, volsella as in Fig. 696, and gonostyle as in Fig. 695.

♀: unknown.

**R e l a t i o n s h i p s :** This new species is related to *A. ganquana* YANG & LI (1989), but differs from the latter by the sparse, short setae of the back and side of the thorax, the longitudinally striae of the scutellum slender, the propodeal enclosure with a median carina, the oblique striae more longitudinal, and by the male genitalia. "

**G e o g r a p h i c a l d i s t r i b u t i o n :** China (Shaanxi Province).

***Ammophila occipitalis* F. MORAWITZ (Figs 67, 132, 162, 283, 320, 354, 417, 478/b, 537, 590)**

*Ammophila occipitalis* F. MORAWITZ 1890: 583, ♀, ♂. Lectotype: ♂, Turkmenistan: Tedjen, (NMTW), examined, **present designation**.

*Ammophila ruficollis* F. MORAWITZ 1890: 586, ♀. Holotype: ♀. Turkmenistan: Tedjen (ZIN), examined, **new synonym**.

**M a t e r i a l e x a m i n e d :** Lectotype ♂ (NMTW), 1♀ (NMTW), 4♀♀, 16♂♂ (OÖLM), 3♀♀, 2♂♂ (BMNH), 1♀, 1♂ (coll. Schmid-Egger), 1♀ (coll. Jacobs).

**N o t e :** The female described by F. MORAWITZ (1890: 583) as *Ammophila occipitalis* is conspecific with *Ammophila elongata* FISCHER DE WALDHEIM 1843 and the female described by F. MORAWITZ (1890: 586) as *Ammophila ruficollis* is actually the female of *Ammophila occipitalis*.

**R e c o g n i t i o n :** *Ammophila occipitalis* has the gastral apex black without metallic shine, the episternal sulcus extending to the anteroventral margin of the pleuron and the pronotal collar coarsely transversely ridged. Additionally, the mesothoracic venter is concave anteriorly, the depression is margined by a carina that forms one small projection on each side, the arolia are small but distinct. The wings are hyaline and the propodeal enclosure is reticulate, covered with appressed silvery setae along the midline, coarsely transversely ridged and glabrous laterally. The head (except vertex), the thorax

and the propodeum laterally are covered with appressed silvery setae. Both sexes of *A. gracillima* differ from *A. occipitalis* in having a propodeal enclosure all covered with appressed silvery setae and the episternal sulcus ending at the level of the scrobe. The female of *A. elongata* differs from *A. occipitalis* in having the episternal sulcus ending at the level of the scrobe and apronotal collar with a wide triangular antero-medial concavity which intersects the anterior transverse carina (Fig. 131). The male of *A. elongata* differs from *A. occipitalis* in having the episternal sulcus ending at the level of the scrobe and a pronotal collar anteriorly produced and medially emarginate (Fig. 319).

**Description:** Gastral apex black, without metallic shine, episternal sulcus extending to anteroventral margin of pleuron, pronotal collar coarsely transversely ridged. Mesothoracic venter concave anteriorly, depression margined by carina that forms one small projection on each side, arolia small but distinct, claws without basal tooth. Wings hyaline. Propodeal enclosure reticulate, covered with appressed silvery setae along midline, coarsely transversely ridged and glabrous laterally. Head (except vertex), thorax and propodeum laterally covered with appressed silvery setae; erect setae silvery-white.

♀: 18-21 mm. Black, with following yellowish-brown: mandible (except apex), clypeus along free margin, scape, pedicel, fore- and midlegs (except coxa), hindlegs (partly), pronotal collar (in some specimens black), pronotal lobe, tegula, petiole (in some specimens dark-brown), tergum I, gastral segments II-IV and legs. Petiole and legs pruinose. Clypeus not elongate, free margin nearly straight (Fig. 67), disk flat. Supra-antennal lamellate projection absent. Scutum coarsely transversely rugose and punctate along distinct admedian line, scutellum coarsely longitudinally ridged and punctate. Pronotal collar dorsally: Fig. 132, laterally: Fig. 162. Flagellomere I: II=2.0-2.3; length of petiole = hindtarsomeres I+II.

♂: 16-22.5 mm. Black, with following yellowish-brown: mandible (except apex), legs (coxae, trochanters and hindtibia partly black), tegula, tergum I (dorsally black), gastral segments II, III and basal half of IV. Clypeus elongate, slightly emarginate, disk nearly flat (Fig. 354). Pronotal collar as long as half of scutum, coarsely transversely rugose (Figs 283, 320), scutum transversely rugose like collar, admedian line distinct. Scutellum coarsely longitudinally rugose. Mesopleuron and propodeum laterally coarsely obliquely punctato-rugose. Gonostyle laterally: Fig. 417; penis valve laterally: Fig. 478/b, ventrally: Fig. 537, apically: Fig. 590. Flagellomere I: II=2.0-2.3; length of petiole = hindtarsomeres I+II+0.3×III to I+II+0.5×III.

**Geographical distribution:** Uzbekistan, Turkmenistan, Mongolia, Turkey, Iran, Jordan, Israel.

### ***Ammophila ohli* DOLLFUSS nov.sp. (Figs 16, 23, 196)**

**Records:** Holotype: ♀, Uzbekistan: Zeravshan Mts., Aman-Kutan pass, 1800m, 24. V.2000, leg. V. Gorko (OÖLM). Paratype: ♀, same locality (OÖLM).

**Name derivation:** In honor of the specialist of Specidae and head of the Entomological Collections Dr. Michael Ohl, Museum für Naturkunde, Humboldt-Universität, Berlin, Germany.

**Recognition:** The female of *Ammophila ohli* is characterized by a transversely ridged pronotal collar, the clypeus slightly elongate, the median lobe laterally delimited

by erect tooth and black erect setae (Fig. 23), the clypeal disk nearly flat (Fig. 16). The episternal sulcus ends at the level of the scrobe, the supra-antennal lamellate projection is absent and the mesothoracic venter is not prominent anteriorly. The female of *A. schmideggeri* differs from *A. ohli* in having red legs. The female of *A. ohli* differs from *A. sabulosa* in having the pronotal collar distinctly transversely ridged and a propodeal enclosure laterally glabrous (*A. sabulosa* has the pronotal collar not transversely ridged and the propodeal enclosure all covered with erect setae).

**Description:** Pronotal collar transversely ridged, episternal sulcus ending at level of scrobe, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, arolia developed, claws without basal tooth.

♀. 20-21 mm. Black except tergum I (except basally), gastral segments II and III red. Clypeus, frons, pronotal lobe, mesopleuron, propodeum posterolaterally and coxae covered with appressed silvery setae; erect setae white. Clypeus slightly elongate, median lobe laterally delimited by erect tooth and black erect setae (Fig. 23), clypeal disk nearly flat (Fig. 16); ventral part of clypeus shiny, sparsely punctate. Vertex dull, sparsely finely punctate. Pronotal collar dorsally and laterally distinctly transversely ridged. Scutum coarsely punctate and transversely ridged anteriorly, obliquely ridged posteriorly, admedian line distinct. Scutellum and metanotum longitudinally ridged and punctate. Propodeal enclosure obliquely striate, covered with sparse, appressed silvery setae along midline, glabrous laterally. Mesopleuron, metapleuron and propodeum punctato-rugose laterally. Foretarsomeres asymmetrical, with black spines. Flagellomere I: II=1.7; length of petiole = hindtarsomeres I+0.3×II to I+0.6×II.

♂: unknown.

**Geographical distribution:** Uzbekistan.

### ***Ammophila pachythoracalis* YANG & LI (Figs 707-715)**

*Ammophila pachythoracalis* YANG & LI 1989: 107, ♂. Holotype: ♂, China: Shaanxi Province: Ganquan County: Quingquan (Beijing Agricultural University), not examined.

**Material examined:** None.

**Description:** (YANG & LI 1989: 107, translated from Chinese by Yan Chengjin): "♂: Body length 17.0 mm. Black; petiole apex ventrally, tergum I largely, tergum II, sternum II, base of tergum III and sternum III yellowish red; gastral apex black without metallic blue luster; posterior part of tegula and wings pale yellowish brown, veins dark brown. Vertex, frons, gena and prosternum with long white setae, other areas with sparse, short setae. Pronotal lobe sparsely pubescent at middle, gastral petiole basally pubescent. Vertex, frons and clypeus sparsely punctate, with supra-antennal projection; anterior margin of clypeus emarginate medially. Postocellar diameter (ODD): postocellar distance (POD): oculocellar distance (OOD): interocular distance at anterior ocellus (IODP): interocular distance at clypeus (IODC) = 1: 2: 3: 9: 4.4. Relative length of antennal pedicel: flagellomeres I: II: III: IX = 1.7: 4.3: 2: 2: 1.7. Pronotal collar: length: width = 4.5: 9, sparsely punctate, with deep median furrow; anterior slope swollen, with transverse, dense, slender striae. Scutum with short admedian line, transversely, densely, finely striate and punctate; scutellum longitudinally striate; metanotum without distinct striae; propodeal enclosure with median carina, coarsely, obliquely striate laterally. Mesopleuron and mesosternum transversely striate and punctate, episternal sulcus present; metapleuron and lateral side of propodeum coarsely rugose-striate. Submarginal

cell III petiolate. Claws simple, with arolia. Hindleg: relative length of tibia: tarsi I: II: III = 22.2: 11.7: 6.3: 4.9. Length of gastral petiole: terga I: II = 17: 15: 10.7. Genitalia with penis valves as in Fig. 712, 713, volsella as in Fig. 715, and gonostyli as in Fig. 714.

♀ unknown.

**R e l a t i o n s h i p s :** This new species is related to *A. ganquana* YANG & LI (1989) and *A. obliquestriolis* YANG & LI (1989) but it differs from *A. obliquestriolis* in having a swollen pronotal collar and a different shape of genitalia, as well as the sculpture of the scutellum and prodeal enclosure."

**G e o g r a p h i c a l d i s t r i b u t i o n :** China (Shaanxi Province).

***Ammophila pakistana* DOLLFUSS nov.sp. (Figs 252, 306, 368, 438, 505, 560)**

**R e c o r d s :** Holotype: ♂, Pakistan: Quetta, Col. C. G. Nurse (BMNH).

**N a m e d e r i v a t i o n :** the species is named after Pakistan, where the holotype was collected.

**R e c o g n i t i o n :** The male of *Ammophila pakistana* is characterized by a forewing with three submarginal cells, the partly red gaster without a metallic shine, the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron. It shares the appressed silvery setae on thorax and propodeum laterally with *A. smithii* but differs in having the propodeal enclosure covered with appressed silvery setae along the midline, transversely striate and glabrous laterally and the free margin of the clypeus elongate and broadly truncate (Fig. 252) (*A. smithii* has the propodeal enclosure all covered with appressed silvery setae and the free margin of the clypeus is not so broad (Fig. 248).

**D e s c r i p t i o n :** ♂: 19.5 mm. Black, with following red: mandible (except apex), clypeus next to free margin, scape anteriorly, tegula, legs (coxae, trochanters and femora dorsally darkened), petiole, tergum I (dorsally brown), gastral segments II-IV, sterna V-VII. Wings hyaline. Head (except vertex), thorax and propodeum laterally covered with dense appressed silvery setae that obscure most of underlying sculpture; coxa and petiole pruinose. Free margin of clypeus elongate, broadly truncate (Fig. 252), disk nearly flat (Fig. 368). Frons sparsely, coarsely punctate; supra-antennal lamellate projection absent, vertex coarsely punctate (punctures 1-2 diameters apart). Pronotal collar slightly elongate (Fig. 306), sparsely punctate; scutum coarsely punctate (punctures 1-2 diameters apart). Scutellum with median longitudinal carina, metanotum irregularly sculptured. Propodeal enclosure covered with appressed silvery setae along midline, glabrous and distinctly transversely striate laterally. Mesopleuron, metapleuron and propodeum laterally covered with appressed setae. Mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia well developed, claws without basal tooth. Gonostyle laterally: Fig. 438; penis valve laterally: Fig. 505, ventrally: Fig. 560. Flagellomere I: II=1.4; length of petiole = hindtarsomeres I+II+III.

♀ unknown.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Pakistan.

***Ammophila persica* DOLLFUSS nov.sp. (Figs 256, 261, 373, 361, 443, 497, 562, 608)**

**R e c o r d s :** Holotype: ♂, Iran, Buyer Ahmad, Kohgiluyeh prov., Kuh Gol near Sisakut, 30.84°N 51.53°E, 2500m, leg. Mi. Halada (OÖLM). Paratype: ♂, same locality (OÖLM).

**N a m e d e r i v a t i o n :** This species is named after Persia, the former name of Iran, where the type material was collected.

**R e c o g n i t i o n :** The male of *Ammophila persica* is small (length 14 mm), slender with a forewing with three submarginal cells, black legs, the pronotal collar coarsely transversely rugose, the gastral apex black without a metallic shine and the supra-antennal lamellate projection is absent. In addition, the mesothoracic venter is not distinctly prominent anteriorly, the episternal sulcus ends at the level of the scrobe, the arolia are well developed and the claws without basal tooth. The male of *A. schmideggeri* differs from *A. persica* in having red legs and a differently shaped clypeus (Fig. 235). The male of *A. striata* differs from *A. persica* in having the gastral apex with a metallic shine. The male of *A. persica* differs from *A. sinensis* in having the mesothoracic venter anteriorly not prominent, the episternal sulcus ending at the level of scrobe and a differently shaped clypeus (Fig. 256). The male of *A. occipitalis* differs from *A. persica* in having red legs and a mesothoracic venter anteriorly concave, the depression is margined by a carina that forms one small projection on each side.

**D e s c r i p t i o n :** ♂: 14 mm. Black except tergum I, gastral segment II (both with black stripe dorsally) and segment III (partly) red. Clypeus, frons, pronotal lobe, mesopleuron, metapleuron and propodeum laterally and posterolaterally covered with appressed silvery setae; erect setae silvery-white. Clypeus slightly elongate (Fig. 256), disk flat (Fig. 373). Frons densely, vertex sparsely punctate. Pronotal collar slightly irregularly, transversely ridged, shiny (Fig. 261), scutum coarsely transversely rugose-reticulate, admedian line distinct. Scutellum coarsely, irregularly longitudinally rugose, metanotum coarsely reticulate. Mesopleuron, metapleuron and propodeum laterally coarsely reticulate. Propodeal enclosure coarsely reticulate and covered with sparse appressed silvery setae medially, more regularly obliquely rugose and glabrous laterally. Mesothoracic venter anteriorly not prominent, episternal sulcus ending at level of scrobe, arolia well developed, claws without basal tooth. Gonostyle laterally: Fig. 443; penis valve laterally: Fig. 497, ventrally: Fig. 562, apically: Fig. 608. Flagellomere I: II=1.8-2.0; length of petiole = hindtarsomeres I+II to I+II+0.75×III.

♀ unknown.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Iran.

### ***Ammophila poecilcnemis* MORICE (Figs 31, 383, 453, 517, 571)**

*Ammophila poecilcnemis* MORICE 1900: 67, ♀, ♂. **Lectotype:** ♂, Algeria: Biskra (OXUM), examined, **present designation.**

**M a t e r i a l e x a m i n e d :** **Lectotype** ♂ (OXUM), 17 ♀♀, 12 ♂♂ (OÖLM), 1 ♀ (BMNH), 7 ♀♀, 17 ♂♂ (coll. Schmid-Egger), 2 ♀♀, 3 ♂♂ (coll. Jacobs).

**R e c o g n i t i o n :** *Ammophila poecilcnemis* has the gastral apex black with a blue metallic shine and the episternal sulcus extending to the anteroventral margin of the pleuron. Additionally, the mesothoracic venter is not prominent anteriorly and the supra-antennal lamellate projection is absent or slightly developed. The female differs from *A. holosericea* in having the mesopleuron, the metapleuron and the propodeum laterally evenly covered with appressed silvery setae and a yellowish-brown petiole (*A. holosericea* has no appressed silvery setae on the metapleuron and a black petiole). The female of *A. dubia* differs from *A. poecilcnemis* in having the terga V and VI pruinose (The terga V and VI of *A. poecilcnemis* are not pruinose). The female of *A.*

*poecilocnemis* differs from *A. heydeni* in having the mesopleuron, the metapleuron and the propodeum laterally evenly covered with appressed silvery setae and the gastral apex with metallic shine (*A. heydeni* has the metapleuron with no or distinctly less appressed silvery setae and the gastral apex without metallic shine). The male of *A. poecilocnemis* differs from *A. holosericea* in having the mesopleuron, the metapleuron and the propodeum laterally evenly covered with sparse, appressed, silvery setae, a reddish petiole and the gonostyle apically broad (Fig. 383). The male of *A. dubia* differs from *A. poecilocnemis* in having terga V and VI pruinose and the gonostyle apically small (Fig. 384). The male of *A. heydeni* differs from *A. poecilocnemis* in having the gastral apex without metallic shine, the metapleuron without appressed silvery setae and the gonostyle small in apical half (Fig. 376).

**Description:** Gastral apex black with blue metallic shine, episternal sulcus extending to anteroventral margin of pleuron, mesothoracic venter not prominent anteriorly, supra-antennal lamellate projection absent or slightly developed, arolia large and claws without basal tooth.

♀: 15-22 mm. Black, with following yellowish-brown: mandible (except apex), tegula, fore- and midlegs (except coxae and trochanters), basal half of hindtibia, petiole, tergum I (except basally) and gastral segments II and III. In some specimens terga I-III with black dorsal stripe and mandible brown. Clypeus (except ventral one-third), frons, gena, mesopleuron, metapleuron, propodeum laterally and coxal covered with sparse appressed silvery setae; erect setae white. Clypeus slightly elongate (Fig. 31) and sparsely punctate, disk convex. Scutum transversely striate, scutellum longitudinally striate. Propodeal enclosure irregularly obliquely rugose, covered with sparse, fine, appressed silvery setae and white erect setae. Flagellomere I: II=1.5-1.7; length of petiole = hindtarsomeres I+II to I+II+III.

♂: 16.5-18 mm. Black, with following yellowish-brown: tegula, fore- and midlegs (except coxae and trochanters), basal half of hindtibia, petiole, tergum I and gastral segments II and III; black dorsal stripe on terga I-III. Head (except vertex), thorax, propodeum and coxa covered with sparse, appressed silvery setae; erect setae silvery-white. Clypeus elongate, disk slightly convex. Propodeal enclosure irregularly obliquely rugose and covered with sparse, fine appressed silvery setae and silvery-white erect setae. Gonostyle in lateral view broad in apical half (Fig. 383); penis valve laterally: Fig. 453, ventrally: Fig. 517, apically: Fig. 571. Flagellomere I: II=1.3-1.5; length of petiole = hindtarsomeres I+II+0.5×III to I+II+0.75×III.

**Geographical distribution:** Jordan, Yemen, Saudi Arabia, Algeria, Tunisia, Morocco, Western Sahara, Chad.

***Ammophila producticollis* MORICE (Figs 50, 89, 125, 146, 208, 273, 312, 344, 403, 525)**

*Ammophila producticollis* MORICE 1900: 67, ♀, ♂ (♂ = *Ammophila gracillima*). Syntypes: Algeria: Biskra (OXUM), not examined.

*Ammophila divina* KOHL 1901: 157, ♀. Holotype: ♀, origin unknown (NHMW), examined. Synonymized with *Ammophila producticollis* by KOHL 1906: 347.

*Ammophila argentina* GUSSAKOVSKIJ 1930: 202, ♀, ♂. Syntypes ♀, ♂: Uzbekistan: Karakul (ZIN), photographs examined. Synonymized with *Ammophila producticollis* by PULAWSKI in BOHART & MENKE 1976: 153, synonymy confirmed.

**Material examined:** 5♀♀, 2♂♂ (OÖLM), 4♀♀ (coll. Schmid-Egger).



**R e c o g n i t i o n :** *Ammophila producticollis* has the gastral apex black or yellowish-brown without a metallic shine and the head, the thorax and the propodeum (including enclosure) covered with dense appressed silvery setae that obscure most of the underlying sculpture; silvery white erect setae are only on the head, the prothorax and the forelegs. Additionally, the wings are hyaline, the mesothoracic venter is not prominent anteriorly, the supra-antennal lamellate projection is absent and the episternal sulcus extends to the anteroventral margin of the pleuron. The female of *A. gracillima* is similar but differs in having the mesothoracic venter anteriorly prominent and margined by a carina that forms one small projection on each side, the clypeus not elongate (Fig. 48) and in most specimens transverse rugae on the pronotal collar. The female of *A. induta* differs from *A. producticollis* in having the propodeal enclosure covered with appressed silvery setae along the midline and glabrous laterally. The female of *A. tekkensis* differs from *A. producticollis* in having the clypeus not elongate and not emarginate (*A. producticollis* has a clypeus elongate and medially with a small emargination (Fig. 50). The male of *A. induta* differs from *A. producticollis* in having the propodeal enclosure covered with appressed silvery setae along midline, obliquely ridged and glabrous laterally. The male of *A. gracillima* differs from *A. producticollis* in having the mesothoracic venter anteriorly prominent, concave for the reception of the forecoxa, the depression margined by a carina that forms one small projection on each side and a pronotal collar in most specimens with transverse rugae.

**D e s c r i p t i o n :** Gastral apex black or yellowish-brown, without metallic shine; head, thorax and propodeum (including propodeal enclosure) covered with dense appressed silvery setae that obscure most of underlying sculpture. Only head, prothorax ventrally and forelegs covered with silvery-white erect setae. Wings hyaline, mesothoracic venter not prominent anteriorly, supra-antennal lamellate projection absent, episternal sulcus extending to anteroventral margin of pleuron, claws without basal tooth.

♀: 15-18 mm. Black, with following yellowish-brown: mandible (except apex), scape, pronotal lobe, tegula, legs, petiole and nearly all gaster. In some specimens from Oman the thorax (except scutum) and the propodeum also yellowish-brown. Arolia small, foretarsomere distinctly asymmetrical, foretarsal rake with slender, white spines. Clypeus elongate, medially with small emargination (Fig. 50), disk distinctly convex (Fig. 89). Pronotal collar longer than half of scutum (Fig. 125) and nearly flat (Fig. 146). Flagellomere I: II=1.6-2.1; length of petiole = hindtarsomeres I+II+0.3×III to I+II+0.6×III.

♂: 15 mm. Black, with following yellowish-brown: mandible (except apex), scape, tegula, clypeus adjacent to free margin, legs (partly or all), tergum I (except for dorsal black stripe) and gastral segments II and III; segments IV-VII dorsally black, but in some specimens gaster nearly all yellowish-brown. Clypeus elongate (Fig. 208), disk distinctly convex on its basal half (Fig. 344). Pronotal collar elongate, distinctly more than half as long as scutum (Fig. 312) and flat, without transverse striae (Fig. 273). Scutum with deep admedian line and no transverse striae. Scutellum and metanotum with two tubercles medially. Dorsal margin of petiole socket nearly attaining propodeum dorsum. Gonostyle laterally: Fig. 403; penis valve laterally: Fig. 470, ventrally: Fig. 525. Flagellomere I: II=1.3-1.4; length of petiole = hindtarsomeres I+II+0.3×III to I+II+III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Algeria, Tunisia, Morocco, Egypt (Sinai Peninsula), Yemen, Saudi Arabia, Oman, Chad, Niger, Israel, Jordan, Kyrgyzstan, Turkmenistan, Tajikistan, Uzbekistan.

***Ammophila pseudoheydeni* LI & HE (Figs 725-733)**

*Ammophila pseudoheydeni* LI & HE 2000: 337, ♀, ♂. **Holotype**: ♀, China: Xinjiang: Wulumuqui at 43.8°N 87.6°E (Zhejiang Agricultural University), not examined.

**Material examined**: None.

**Description** (LI & HE 2000: 337): "♀: Body length 15-21 mm. Black; basal half of mandible, clypeus next to free margin, antenna partly, tegula, legs largely or wholly, gastral petiole, terga I-IV and sterna II-IV yellowish red; tergum V and sternum V yellowish red or all black; gastral apex black with weak metallic blue luster; wings pale yellowish brown, veins yellowish brown or brown. Clypeus except free margin, lower frons, gena, pronotum laterally including pronotal lobe, scutum posterolaterally, prepectus, mesopleuron and propodeum posterolaterally covered with dense appressed silvery setae; collar, anterior half of scutum, scutellum laterally and metanotum laterally, propodeum, sterna of thorax and coxae with appressed silvery setae; head and thorax with long, erect, white setae. Clypeus densely punctate, free margin with two lateral teeth (Fig. 725). Frons densely punctate, without distinct supra-antennal projection. Vertex sparsely punctate. Postocellar distance (POD): oculocellar distance (OOD): interocular distance at anterior ocellus (IODP): interocular distance at clypeus (IODC) = 21: 29: 96: 82. Relative length of antennal pedicel: flagellomeres I: II: III: VIII: IX = 15: 51: 31: 31: 22: 21. Pronotal collar (Fig. 726) length: width = 50: 87, densely punctate, with shallow median furrow, weakly transversely rugose-striate on anterior slope. Scutum with complete admedian line, side of anterior half transversely rugose-striate and punctate, medial region of posterior half longitudinally rugose-striate. Scutellum longitudinally rugose-striate and punctate. Metanotum sparsely punctate. Mesopleuron with episternal sulcus, other structures covered by dense appressed silvery setae. Metapleuron coarsely, irregularly rugose-striate. Propodeal enclosure with weak median carina, surface irregularly obliquely rugose-striate laterally; lateral side of propodeum coarsely, irregularly rugose-striate. Submarginal cell III without petiole (Fig. 730). Tarsomere I of foreleg with seven large setae (Fig. 728); hindleg: relative length of tibia: tarsomere I: II: III = 215: 119: 65: 50. Length of gastral petiole: tergite I: II = 195: 177: 135.

♂: Body length 17.0-18.8 mm. Similar to female. Clypeus black, mandible reddish-brown or black, antenna dark brown or black. Free margin of clypeus emarginate medially. POD: OOD: IODP: IODC = 22: 31: 100: 58. Relative length of antennal pedicel: flagellomeres I: II: III: VIII: IX = 14: 48: 35: 35: 21: 20. Pronotal collar length: width = 40: 90, without median furrow. Posterior half of scutum not rugose-striate. Propodeal enclosure reticulate-striate medially, rugose-striate laterally. Hindleg: relative length of tibia: tarsomere I: II: III = 232: 118: 64: 50. Length of gastral petiole: terga I: II = 200: 190: 139. Genitalia with penis valves as in Fig. 731, volsella as in Fig. 732 and gonostyli as in Fig. 733.

**Relationships**: This species is related to *A. heydeni* DAHLBOM, but differs by the shape of the anterior margin of clypeus, the sculpture of scutum and propodeal enclosure as outlined in the text, gastral petiole longer than hindtarsomeres I + II and in male only 1/5-1/6 shorter than the hindtibia, coloration of body, appressed silvery setae on head and thorax, and by the male genitalia."

**Geographical distribution**: China (Xinjiang).

***Ammophila pseudonasuta* BYTINSKI-SALZ (Figs 202, 203, 337, 395, 396, 461, 577)**

*Ammophila pseudonasuta* BYTINSKI-SALZ in DE BEAUMONT & BYTINSKI-SALZ 1955: 37, ♂.  
Holotype: ♂. Israel: Bat Yam (H. Bytinski-Salz coll., now Tel Aviv University), not examined.

Material examined: Israel: 8 km NNE Ashqelon dunes Nizzanim 31°45'N 34°37'E (1 ♂ OÖLM, 5 ♂ ♂ coll. Schmid-Egger).

Recognition: The male of *Ammophila pseudonasuta* has the gastral apex black without metallic shine, the supra-antennal lamellate projection absent, the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron. Additionally, the clypeal free margin is widely emarginate (Fig. 202) and the large (2 mm) genitalia are characteristically shaped (Figs 395, 396, 461, 577). The male of *A. antropovi* is similar but differs in having the clypeal free margin narrowly emarginate (Fig. 204), the labrum with a preapical spine, the penis valve ending in a shorter spine (Fig. 463) and the gonostyle apically not broadened (Fig. 397).

Description: ♂: 18-21 mm. Gastral apex black without metallic shine, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia well developed and claws without basal tooth. Black, with following red: mandible (except apex), tegula, fore- and midlegs (except coxa and trochanter), hindfemur and hindtibia partly (in some specimens nearly all black), tergum I (dorsally black), gastral segments II-VII (dorsally more or less black); wings hyaline. Clypeus, frons, gena, pronotal lobe, anterior half of scutum, mesopleuron (including ventrally), broad patch on propodeum posterolaterally and coxa covered with appressed silvery setae. Metapleuron and ventrolateral part of propodeum in most specimens not covered with appressed setae; erect setae silvery-white. Inner margin of mandible with one subapical tooth and distinctly basal tooth; labrum with apical spine. Clypeus elongate and ventral margin in dorsal view widely emarginate (Fig. 202), broadened and slightly concave (Fig. 203), disk in ventral half concave, in dorsal half convex (Fig. 337). Vertex shiny, finely and sparsely punctate. Pronotal collar shiny and sparsely punctate, slightly three-tuberculate. Scutum coarsely punctate and slightly transversely rugose, scutellum longitudinally ridged and punctate. Propodeal enclosure punctato-rugose medially, obliquely rugose laterally, all covered with erect setae. Genitalia large (2 mm): gonostyle laterally: Fig. 395, apically broadened in ventral view: Fig. 396; penis valve laterally: Fig. 461, apically: Fig. 577. Flagellomere I: II=1.7-2.0; length of petiole = hindtarsomeres I+0.6×II to I+II.

♀ unknown.

Geographical distribution: Egypt (Sinai), Israel.

***Ammophila pubescens* CURTIS (Figs 293, 426, 490, 548, 598)**

*Ammophila pubescens* CURTIS 1828-1829: 122 (nomen nudum).

*Ammophila pubescens* CURTIS 1836: explanation of pl. 604, ♀, ♂ (as junior synonym of *Ammophila campestris*). Syntypes: Great Britain: no specific locality (depository ?), not examined.

*Miscus arvensis* DAHLBOM 1843: 8, ♂. Holotype: ♂, USA: Pennsylvania: no specific locality (Lund), not examined. Synonymized with *Ammophila pubescens* by MENKE 1964: 153.

*Ammophila susterai* ŠNOFLAK 1943: 1, ♀, ♂. Holotype: sex not indicated: Czech Republik: locality not specified (NMPC), not examined. Synonymized with *Ammophila pubescens* by BALTHASAR 1958: 339.

*Ammophila campestris* var. *alpicola* DE BEAUMONT 1945: 468, ♀, ♂. **Holotype**: ♂, Switzerland: Sierre (Lausanne), not examined. Synonymized with *Ammophila pubescens* by Richards 1946: 235.

*Ammophila adriaansei* WILCKE 1945: 277, ♀, ♂. **Syntypes**: sex not indicated, Netherlands: no specific locality (Amsderdam Mus., Wageningen Inst., and A. Wilcke coll.), not examined. Synonymized with *Ammophila pubescens* by RICHARDS 1946: 235.

*Ammophila arnaudi* TSUNEKI 1967: 289, ♂. **Holotype**: ♂, China: Heilongjiang Sheng: Estentientze, 65 km E Harbin (CAS), examined, **new synonym**.

**Material examined**: 83 ♀♀, 96 ♂♂ (OÖLM), 23 ♀♀, 20 ♂♂ (NHMW), 3 ♀♀, 2 ♂♂ (ZMHU).

**Recognition**: *Ammophila pubescens* has a submarginal cell III petiolate, the gastral apex black without metallic shine, the supra-antennal lamellate projection absent and the propodeal enclosure glabrous. The erect setae are black. The female differs from *A. campestris* in having the petiole ventrally with distinct erect setae and the propodeal enclosure obliquely striate and micropunctate (*A. campestris* has the petiole without erect setae ventrally and the propodeal enclosure is shiny). The female of *A. afghanica* is similar to *A. pubescens* but differs in having the clypeus and the frons covered with distinct, appressed silvery setae, the erect setae on the head are white, and the scutum is shiny with transverse striae (*A. pubescens* has no distinct, appressed silvery setae on the clypeus and frons and the scutum is dull). The male of *A. pubescens* differs from *A. campestris* in having a dorsal black stripe on terga I and II, the propodeal enclosure micropunctate and in most specimens the petiole ventrally with erect setae (*A. campestris* has terga I and II all red and the propodeal enclosure shiny).

**Description**: Submarginal cell III petiolate, gastral apex black without metallic shine, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly and episternal sulcus extending to anteroventral margin of pleuron. Propodeal enclosure glabrous, arolia well defined and claws without basal tooth.

♀: 15-19 mm. Black except tergum I (except basally), gastral segment II and the basal half of III red. Pronotal lobe, patch along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae. In some specimens clypeus and frons pruinose. Erect setae on head black, on remaining areas brown to white. Clypeus slightly elongate with distinct median lobe, disk slightly convex. Pronotal collar dull and sparsely, finely punctate, scutum dull and punctate (punctures 0-2 diameters apart), laterally transversely microstriate; scutellum longitudinally striate. Mesopleuron dull, irregularly punctate, metapleuron and propodeum laterally dull and punctato-rugose. Propodeal enclosure obliquely striate, micropunctate between striae. Petiole ventrally with distinct, erect setae. Flagellomere I:  $II=1.5-1.7(2.0)$ ; length of petiole =  $hindtarsomeres\ I+0.3\times II$  to  $I+0.5\times II$ .

♂: 12.5-18 mm. Black except terga I and II (except for dorsal black stripe) red, in some specimens gaster nearly all black. Clypeus, frons and propodeum posterolaterally covered with distinct appressed silvery setae. In some specimens mesopleuron, pronotal lobe, propodeum laterally and hindcoxa pruinose. Erect setae on head black, on remaining areas white, sterna VII and VIII covered with appressed brown setae. In most specimens petiole ventrally with erect setae. Clypeus slightly elongate, disk nearly flat. Pronotal collar dull, nearly impunctate, scutum dull, transversely microstriate, scutellum longitudinally striate. Mesopleuron, metapleuron and propodeum laterally dull, irregularly punctate (punctures 0-3 diameters apart); propodeal enclosure obliquely

striate and micropunctate. Pronotal lobe laterally: Fig. 293. Gonostyle laterally: Fig. 426; penis valve laterally: Fig. 490, ventrally: Fig. 548, apically: Fig. 598. Flagellomere I: II=1.4-1.6; length of petiole = hindtarsomeres I+0.75×II to I+II.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Palearctic Region.

***Ammophila pulawskii* TSUNEKI (Figs 42, 114, 182 and 620-630)**

*Ammophila pulawskii* TSUNEKI 1971: 175, ♀, ♂. Holotype: ♂, Mongolia: Bayanhongor Aymag: Ehingol oasis (TMB), paratype ♀ examined.

**M a t e r i a l e x a m i n e d :** ♀ paratype (TMB).

**R e c o g n i t i o n :** *Ammophila pulawskii* has the gastral apex black without metallic shine, the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron (but covered with appressed silvery setae). The head, the thorax and the propodeum (including propodeal enclosure) are covered with appressed silvery setae; the erect setae are white. The female is similar to *A. roborowskyi* but differs in having the mandible and the scape nearly black (*A. roborowskyi* has the mandible and the scape yellowish-brown). The female of *A. erminea* is similar to *A. pulawskii* but differs in having a more prominent clypeus (Fig. 40).

**D e s c r i p t i o n :** Gastral apex black without metallic shine, mesothoracic venter not prominent anteriorly, episternal sulcus extending to the anteroventral margin of pleuron (but covered with appressed silvery setae), arolia well developed, claws without basal tooth. Head, thorax and propodeum (including propodeal enclosure) covered with appressed silvery setae; erect setae silvery-white.

♀: 14 mm. Black, with following yellowish-brown: legs (except coxa and hindtrochanter), tegula, wing veins, petiole (partly darkened), tergum I (with black stripe dorsally) and gastral segments II-IV. Free margin of clypeus nearly straight (Fig. 42), disk convex. Pronotal collar impunctate and without transverse rugae (Figs 114, 182), scutum irregularly, distinctly punctate and scutellum longitudinally ridged and punctate. Propodeal enclosure irregularly ridged and covered with white erect setae and fine appressed silvery setae; mesopleuron punctate. Flagellomere I: II=1.8; length of petiole = hindtarsomeres I+II.

♂ (Tsuneki 1971: 175): 14 mm. Black, with following yellowish-brown: clypeus next to free margin, tegula, tergum I (except dorsal black stripe), terga II-IV, sterna II-V and legs (except coxa, fore- and midtrochanter dorsally, hindtrochanter and hindtibia apically). Mandible medially yellowish-brown and at apex dark reddish; wings hyaline. Pronotal collar shiny, without transverse rugae, scutum coarsely and densely punctate, scutellum coarsely longitudinally ridged; mesopleuron punctate. Genitalia: Gonostyle apical abruptly narrowed, long, nearly parallel: Fig. 625, penis valve laterally: Fig. 630.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Mongolia.

***Ammophila punctata* F. SMITH (Figs 60, 154, 213, 277, 317, 348, 408, 467, 528, 587, 610)**

*Ammophila punctata* F. SMITH 1856: 218, ♀. Syntypes: ♀, Northern India: no specific locality, may be Pakistan (BMNH). Syntype ♀ examined.

**M a t e r i a l e x a m i n e d :** 3♀♀, 2♂♂ (NHMW), 15♀♀, 13♂♂ (OÖLM), 10♀♀, 12♂♂ (BMNH), 1♀, 2♂♂ (ZMHU), 7♂♂ (coll. Schmid-Egger).

**Recognition:** *Ammophila punctata* has the gaster apex black without metallic shine, the supra-antennal lamellate projection not or slightly developed, the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron. The propodeal enclosure is all covered with white erect setae. The female of *A. brevipennis* differs from *A. punctata* in having the clypeus slightly elongate and sinuate (Fig. 56), black erect setae, a red petiole and the propodeal enclosure irregularly rugose and covered with fine, appressed, silvery setae along midline, distinctly transversely rugose and glabrous laterally. The female of *A. infesta* differs from *A. punctata* in having the gastral apex with a distinct metallic shine, the supra-antennal lamellate projection well developed and the propodeal enclosure covered with erect setae along midline and glabrous laterally. The male of *A. punctata* differs from *A. infesta* in having the hypostomal carina with a blunt tooth near the mandibular socket (Fig. 610), the mesopleuron with appressed silvery setae and the scutum coarsely punctate. The male of *A. sabulosa* differs from *A. punctata* in having the hypostomal carina without a blunt tooth near the mandibular socket, the mesopleuron without a spot of distinct appressed silvery setae and the gastral apex with metallic shine. The male of *A. assimilis* differs from *A. punctata* in having the gastral apex with a metallic shine, the scutum shiny and transversely striate and the hypostomal carina without a tooth near the mandibular socket.

**Description:** Gaster apex black, without metallic shine, supra-antennal lamellate projection not or slightly developed, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia distinctly developed and claws without basal tooth.

♀: 20.5-22.5 mm. Black except tergum I (except basally) and gastral segments II and III (partly darkened) red. Clypeus (except ventral margin), frons, pronotal lobe, mesopleuron along mesopleural suture, propodeum posterolaterally and coxa covered with appressed silvery setae; erect setae whitish-brown. Clypeus slightly elongate, median lobe truncate and laterally delimited by an angle (Fig. 60), disk slightly convex. Frons densely, coarsely punctate (punctures 0-1 diameter apart) and pronotal collar densely punctate and in some specimens covered with short, appressed, brownish setae, propleuron transversely striate. Scutum densely, coarsely punctate (punctures 0-1 diameter apart), posterolaterally slightly obliquely striate. Scutellum coarsely punctate on anterior half, longitudinally rugose and punctate on posterior half. Propodeal enclosure coarsely reticulate medially, obliquely rugose laterally, all covered with erect white setae. Mesopleuron and metapleuron coarsely punctate as like scutum. Pronotal collar laterally: fig. 154. Flagellomere I: II=1.6; length of petiole = hindtarsomeres I+0.6×II to I+0.75×II.

♂: 18-20 mm. Black except tergum I, gastral segment II and basal half of III (all with black stripe dorsally) red. Clypeus, frons, pronotal lobe, band along mesopleural suture, propodeum posterolaterally and hindcoxa covered with appressed silvery setae. Head, thorax, coxa and propodeum covered with white erect setae nearly as long as scape. Hypostomal carina with blunt tooth near mandibular socket (Fig. 610). Clypeus elongate, emarginate ventrally (Fig. 213), disk nearly flat (Fig. 348). Frons, pronotal collar and scutum distinctly, densely punctate (punctures 0-1 diameter apart), scutellum punctate on anterior half, longitudinally striate and punctate on posterior half. Propodeal enclosure reticulate with distinct median longitudinal ridge, covered with white erect setae.



Mesopleuron coarsely, densely punctate like scutum. Pronotal collar laterally: Fig. 277, dorsally: Fig. 317. Gonostyle laterally: Fig. 408; penis valve laterally: Fig. 467, ventrally: Fig. 528, apically: Fig. 587. Flagellomere I:  $II=1.3-1.6$ ; length of petiole = hindtarsomeres I+II to I+II+0.25×III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Nepal, India (Himalaya), North Pakistan, Tibet.

***Ammophila punti* GUICHARD (Figs 69, 164, 355, 421, 482, 540, 593)**

*Ammophila punti* GUICHARD 1988: 129, ♀, ♂. Holotype: ♀, Saudi Arabia: Fayfa 60 km N Gizan (BMNH), Paratypes ♀, ♂ examined.

**M a t e r i a l e x a m i n e d :** Yemen: 20 km S Taizz 13°30'N 43°57'E 1200m (1♀ OÖLM), Jabal Bura NNE Al Hudaydah 14°52'N 43°24'E (1♀, 2♂ OÖLM).

**R e c o g n i t i o n :** *Ammophila punti* has the gaster partly black without metallic shine, the pronotal collar (including pronotum laterally), the scutum distinctly transversely ridged and the episternal sulcus ending at the level of the scrobe. In addition, the head, the pronotum and the scutum have conspicuous stiff, dark, erect bristles (Fig. 164). The scutellum and the metanotum are longitudinally striate, the propodeum enclosure is transversely ridged, covered with short erect setae along midline and glabrous laterally. In both sexes the amount of black varies on the thorax. The female of *A. punti* is closely related to *A. haimatosoma* and the Subsaharan *A. beniniensis* and shares with these two species the strong ridging on the thorax and the lack of arolia. It differs from them in having no metallic shine on the gaster and in the greatly increased amount of stiff setae on the head and thorax. The male of *A. punti* is closely related to *A. haimatosoma* and to *A. beniniensis* but differs in having no metallic shine on the gaster, a greatly increased amount of stiff setae on the head and thorax, but the shape of genitalia is nearly identical as in those species. The male of *A. schmideggeri* differs from *A. punti* in having white erect setae on the head and pronotum, a broader median lobe of the clypeus (Fig. 235), a shorter body length (14.5 mm) and differently shaped gonostyle (Fig. 420) and penis valve (Fig. 541).

**D e s c r i p t i o n :** Gaster partly black, without metallic shine, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, pronotal collar (including pronotum laterally) and scutum distinctly, transversely ridged and episternal sulcus ending at level of scrobe. Head, pronotum and scutum with conspicuous stiff, dark erect bristles (Fig. 164). Scutellum and metanotum longitudinally striate, propodeum enclosure transversely ridged, covered with short erect setae along midline, glabrous laterally. In both sexes in the amount of black varies on the thorax.

♀: 21-26 mm. Head, thorax and legs almost entirely red; petiole darkened above, four apical flagellomeres black. Tergum I (dorsally darkened), basal half of gastral segment II and apical gastral segment red; segments III and IV (V) brownish-black. Wings yellowish with darker smudge beyond marginal cell. Clypeus slightly elongate, rounded (Fig. 69), disk convex, sparsely punctate, without appressed silvery setae but with stiff outstanding erect reddish-brown setae. Mesopleuron, metapleuron and propodeal side transversely striate and punctate; arolia absent, claws without basal tooth. Flagellomere I:  $II=1.6-2.0$ ; length of petiole = hindtarsomeres I+0.6×II to I+II.

♂: 20.5-24 mm. Similar to female, but flagellum black, with scape and basal flagellomeres more or less red. Thorax and legs darker than in female, gaster entirely

black except tip. Clypeus and frons covered with appressed silvery setae and thorax and propodeum laterally slightly pruinose. Clypeal median lobe slightly elongate, slightly emarginate across most of the width, disk flat (Fig. 355). Wings smoky, with darker smudge behind marginal cell. Gonostyle laterally: Fig. 421; penis valve laterally: Fig. 482, ventrally: Fig. 540, apically: Fig. 593. Flagellomere I: II=1.4-1.7; length of petiole = hindtarsomeres I+II+III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Saudi Arabia, Oman, Yemen.

***Ammophila quadraticollis* A. COSTA (Figs 45, 117, 140, 206, 271, 342, 310, 400, 464, 581)**

*Ammophila quadraticollis* A. COSTA 1893: 99, ♀. Holotype or Syntypes: ♀, Tunisia: no specific locality (NAPOLI), not examined.

**M a t e r i a l e x a m i n e d :** 5♀♀, 6♂♂ (NHMW), 2♂♂ (OÖLM), 4♀♀, 3♂♂ (coll. Schmid-Egger).

**R e c o g n i t i o n :** *Ammophila quadraticollis* has the gastral apex black with blue metallic shine, the supra-antennal lamellate projection slightly developed and the mesothoracic venter not prominent anteriorly. Additionally, the episternal sulcus extends to the anteroventral margin of the pleuron, the arolia are well developed. The pronotal collar is nearly rectangularly edged (Fig. 117). The females of *A. atlantica*, *A. nasuta* and *A. laevicollis* are similar, but differ in having the pronotal collar with more evenly rounded edges. The female of *A. exsecta* differs from *A. quadraticollis* in having the pronotal collar slightly concave on anterior half, with evenly rounded edges laterally (Fig. 138), the gastral apex black without metallic shine and the thorax with uniformly appressed silvery setae. The female of *A. strumosa* differs from *A. quadraticollis* in having a pronotal collar dorsally with a slight tubercle (Fig. 116). The male of *A. quadraticollis* differs from *A. atlantica*, *A. pseudonasuta*, *A. djaouak* and *A. hemilauta* in having the pronotal collar with nearly rectangular edges (Figs 271, 310) and in the shape of the genitalia.

**D e s c r i p t i o n :** Gastral apex black, with blue metallic shine, supra-antennal lamellate projection slightly developed, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia distinctly developed and claws without basal tooth.

♀: 18.5-20.5 mm. Black, with following red: mandible (except apex), tegula, fore- and midlegs (except coxae), basal half of hindtibia, tergum I (except basal third), and gastral segments II-IV (in some specimens darkened beneath). Clypeus (except anterior half), frons, pronotal lobe, broad band along mesopleural suture, broad band dorsolaterally on propodeum and hindcoxa dorsally covered with appressed silvery setae; erect setae silvery-white. Clypeus distinctly elongate (Fig. 45), ventral half glabrous and sparsely punctate, disk distinctly convex. Pronotal collar characteristically shaped, nearly rectangularly edged (Fig. 117). Scutum distinctly transversely punctato-rugose, scutellum longitudinally ridged and punctate. Propodeal enclosure irregularly rugose medially, obliquely rugose laterally, all covered with erect setae. Mesopleuron and metapleuron punctato-rugose, but metapleuron not covered with appressed silvery setae. Flagellomere I: II=1.6-2.0; length of petiole = I+II to I+II+0.5×III.

♂: 18-21.5 mm. Black, with following red: mandible except apex (in some specimens more darkened), tegula, fore- and midlegs (except coxa), hindtibia basally, tergum I

(dorsally darkened), gastral segment II (dorsally darkened), segments III-V (V apical dark or in some specimens dark with metallic shine). Clypeus, frons, gena, mesopleuron, mesothoracic venter, broad band dorsolaterally on propodeum, coxa, scutum (not obscured all underlying sculpture) and propodeal enclosure (sparsely) covered with appressed silvery setae; legs and gaster pruinose. Inner margin of mandible with subapical tooth and small basal tooth, labrum without tooth. Clypeus distinctly elongate, narrowed, emarginate (Fig. 206), disk concave in ventral half, convex in dorsal half (Fig. 342). Pronotal collar dorsally shiny and punctate and with nearly rectangular edges (Figs 271, 310). Scutum punctato-rugose on anterior half, more transversely rugose on posterior half, scutellum longitudinally rugose and punctate. Sculpture of mesopleuron obscured by appressed silvery setae, metapleuron punctato-rugose and covered only with erect setae. Propodeal enclosure reticulate, covered with fine, appressed, silvery setae and white erect setae. Sterum VIII roof-like, not emarginate. Genitalia characteristically shaped: gonostyle: Fig. 400, penis valve laterally: Fig. 464, ventrally: Fig. 523, apically: Fig. 581. Flagellomere I: II=1.5-2.0; length of petiole = hindtarsomeres I+II+0.25×III to I+II+0.5×III.

**Geographical distribution:** Syria, Israel, Egypt (Sinai Peninsula), Algeria, Libya, Tunisia.

***Ammophila rauschi* DOLLFUSS nov.sp. (Figs 77, 100, 134, 184, 241, 295, 327, 361, 427, 492, 549, 599)**

**Records:** Holotype: ♂, Kyrgyzstan: Talasskaya Oblast, Talass-Mts., river Ara-Byik, 42°23'28"N 70°58'34"E/GPS, 2050-2150m, 3. VII.1998, leg. H. & R. Rausch (OÖLM). Paratypes: Kyrgyzstan: Kirghizsky Mts., Ala-Archa riv. Kashka-Suu, 1650m, VII.2000, leg. V. Gurko (1♀, 1♂ OÖLM); Dzhahal-Abadskaya Obl., Sandalash-Mts., Kuru-Tegerek, 42°02'15"N 71°24'14"E/GPS, 2750-2800m, 10. VII.1998, leg. H. & R. Rausch (1♂ OÖLM); Talasskaya, Nordwestteil des Talasskiy Alatau, SE Amanbaevo, 35-40 km SW Kirovskoye, 42°25'N 71°13'E, 1750m, 13. VI.1996, leg. H. Rausch (1♂ OÖLM); Naryn, Distr. Naryn, Naryn Too, Salkyn-Tör NP., 41°24'43"N 76°11'14"E, 2400-2400m, MSL, 12.-13. VI.2008, leg. H. & R. Rausch (3♂♂ OÖLM); Ferghansky Mt. R., Tooskol-Ata, Pistacea forest, VVV.2000, leg. Gurko (1♀ OÖ LM); Dzahal-Abad area, Shamaldy-Say, VI.2000, leg. Gurko (1♀ OÖLM); Alai Mt. R., Katla-Karakol, VII.2000, leg. Gurko (1♀ OÖLM); South Kazakhstan: Issik 3 km S, 22.-23. VI.1992, leg. K. Deneš (2♂♂ OÖLM).

**Name derivation:** In honor of the collector Hubert Rausch, Scheibbs, Austria.

**Recognition:** *Ammophila rauschi* has submarginal cell III petiolate, the propodeal enclosure glabrous, the gastral apex black without a metallic shine, the mesothoracic venter not prominent anteriorly and the supra-antennal lamellate projection absent. The female of *A. rauschi* differs from all other species with submarginal cell III petiolate in having no appressed silvery setae on the head, the thorax and the propodeum. The male of *A. pubescens* differs from *A. rauschi* in having the gaster black dorsally (at least a black stripe on terga I and II) and the scutum dull, transversely microstriate (*A. rauschi* has terga I and II red and a shiny scutum). The male of *A. campestris* differs from *A. rauschi* in having the mesopleuron and the propodeum posterolaterally with appressed silvery setae and a dull scutum.

**Description:** Submarginal cell III petiolate, propodeal enclosure glabrous, gastral apex black, without metallic shine, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, supra-antennal lamellate projection absent, arolia well developed, claws without basal tooth.

♀: 16-18 mm. Black, with following red: petiole (in some specimens only apical one-fourth), tergum I, gastral segment II and half or all of segment III. Appressed silvery setae absent (at most some on hindcoxa dorsally); erect setae on head and prothorax black, on mesopleuron and propodeum brown laterally. Clypeus slightly elongate, with median lobe (Fig. 77), disk convex (Fig. 100); frons dull, punctate, vertex dull. Pronotal collar dorsally shiny or transversely microstriate (Fig. 134), transversely striate laterally (Fig. 184). Scutum shiny, distinctly transversely striate, coarsely punctate, with distinct admedian line; scutellum longitudinally striate, metanotum irregularly sculptured. Mesopleuron, metapleuron and propodeum laterally coarsely punctato-rugose. Propodeum enclosure glabrous, shiny, reticulate medially, obliquely striate laterally. Flagellomere I: II=1.6-2.0; length of petiole = hindtarsomere I+0.3×II to I+0.6×II.

♂: 14.5-18.5 mm. Black, with following red: petiole (partly or all), tergum I, gastral segment II and basal half of III. Only clypeus and frons with appressed silvery setae; erect setae black. Clypeus elongate (Fig. 241), disk flat (Fig. 361). Frons densely punctate, vertex dull. Pronotal collar shiny dorsally, more or less finely, transversely striate, with median furrow. Scutum shiny, transversely striate and punctate on anterior half, obliquely striate on posterior half, with distinct admedian line; scutellum longitudinally striate; metanotum irregularly sculptured. Mesopleuron, metapleuron and propodeum laterally irregularly punctato-rugose. Propodeal enclosure shiny and more or less irregularly, obliquely striate. Pronotal collar laterally: Fig. 295, dorsally: Fig. 327. Gonostyle laterally: Fig. 427; penis valve laterally: Fig. 492, ventrally: Fig. 549, apically: Fig. 599. Flagellomere I: II=1.6-1.8; length of petiole = hindtarsomeres I+0.5×II to I+II.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Kazakhstan, Kyrgyzstan.

***Ammophila roborowskyi* KOHL (Fig. 41, 113, 181)**

*Ammophila roborowskyi* KOHL 1906: 368, ♀. **Lectotype:** ♀, Mongolia: Sa-Chou oasis, river Daukhe (= Tau-ho) south of Sa-Chou (NHMW), examined, **present designation.**

**M a t e r i a l e x a m i n e d :** lectotype ♀ (NHMW).

**R e c o g n i t i o n :** The female of *Ammophila roborowskyi* has the gastral apex black without metallic shine, the supra-antennal lamellate projection absent, the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the the pleuron. The female differs from *A. pulawskii* in having the mandible and the scape yellowish-brown and a larger body (20 mm) (*A. pulawskii* has the mandible and the scape black and the body length is 14 mm).

**D e s c r i p t i o n :** Gastral apex black, without metallic shine, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia large, claws without basal tooth.

♀: 20 mm. Black, with following yellowish-brown: mandible (except apex), clypeus next free margin, scape (partly), legs (except coxae basally), petiole, tergum I (except basally) and gastral segments II and III (partly darkened). In some specimens coxae and trochanters of fore- and midlegs, hindleg (except tibia basally) and petiole black. Clypeus, frons, pronotal lobe, broad band along mesopleural suture, propodeum posterolaterally and hindcoxa dorsally covered with dense, appressed, silvery setae that obscure underlying sculpture. Pronotal collar, scutum, mesothoracic venter and

propodeal enclosure pruinose. Clypeus slightly elongate (Fig. 41), disk slightly convex; scutum coarsely punctate. Scutellum coarsely punctate on anterior half, longitudinally ridged on posterior half. Pronotal collar dorsally: Fig. 113, laterally: Fig. 181. Flagellomere I: II=1.6; length of petiole = hindtarsomeres I+II+0.3×III.

♂ unknown.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Mongolia, East Iran (GUSSAKOVSKIJ 1933: 274).

***Ammophila rubigege* LI & YANG (Figs 734-746)**

*Ammophila rubigege* LI & YANG 1990: 260, ♀, ♂. Holotype: ♀, China: Nei Mongol: Jungar Banner, Ih Ju League: Mt. Shensan (Beijing Agricultural University).

**M a t e r i a l e x a m i n e d :** None.

**D e s c r i p t i o n :** (LI & YANG 1990: 260, translated from Chinese by Yan Chengjin): "♀: Body length 16.0 mm. Black; posterior half of gastral petiole, terga I-III, and sterna II-III yellowish red; gastral apex with distinct metallic blue luster; posterior part of tegula and wings pale yellowish brown, veins brown. Clypeus, gena and prosternum with long setae, white to brown; clypeus and lower frons covered with pubescence; pronotal lobe, mesopleuron posteriorly and propodeum posterolaterally covered with dense appressed setae; gastral petiole ventrally without pubescence. Vertex, frons, and clypeus sparsely punctate, without supra-antennal projection, free margin of clypeus emarginate medially, with two lateral teeth. Hindocellar diameter (ODD): postocellar distance (POD): oculocellar distance (OOD): interocular distance at anterior ocellus (IODP): interocular distance at clypeus (IODC) = 1: 1.6: 2.5: 7.7: 6.5. Relative length of antennal pedicel: flagellomeres I: II: III: VIII = 1.1: 4.2: 2: 2: 1.5. Pronotal collar: length: width = 4.8: 7.7, transversely rugose-striate and punctate, with shallow, median furrow, transversely rugose-striate on anterior slope. Scutum coarsely, transversely rugose-striate and punctate, with admedian line; scutellum coarsely, longitudinally striate; metanotum without distinct striae; propodeal enclosure with median carina, surface coarsely, obliquely striate laterally; mesopleuron and mesosternum transversely rugose-striate and punctate. Episternal sulcus present, front of mesosternum usual. Metapleuron and lateral side of propodeum coarsely rugose-striate. Submarginal cell III not petiolate. Foretarsus asymmetrical; hindleg: relative length of tibia: tarsomeres I: II: III = 17.8: 9.5: 5.7: 4.3. Claw simple, with arolia. Length of gastral petiole: terga I: II = 13.2: 21.3: 10.4.

♂: Body length 16.0 mm. Similar to female, merely apex of petiole yellowish red; clypeus adjacent to free margin with sparse, long brown setae, head and thorax with long, erect, white setae. Clypeus and lower frons covered with appressed setae. Free margin of clypeus emarginate medially; ODD: POD: OOD: IODP: IODC = 1: 1.4: 2: 6.5: 3.9. Relative length of antennal pedicel: flagellomeres I: II: III: IX = 1.1: 3.5: 2.3: 2.4: 1.7. Pronotal collar: length: width = 4: 7.4, without distinct admedian line; metapleuron and lateral side of propodeum without distinct sculpture; hindleg: relative length of tibia: tarsomeres I: II: III = 17.5: 9: 5.3: 4. Length of gastral petiole: terga I: II = 15: 13.8: 10.4. Genitalia with penis valves (Figs 744, 745), volsella (Fig. 740) and gonostyle (Fig. 746).

**R e l a t i o n s h i p s :** This new species is related to *A. gegen* TSUNEKI (1971), but the latter can be easily distinguished by the different sculpture pattern of the thorax, black petiole and a different shape of male genitalia."

**G e o g r a p h i c a l d i s t r i b u t i o n :** China (Nei Mongol).

***Ammophila rubripes* SPINOLA (Figs 37, 85, 179, 220, 378, 448, 513, 567)**

*Ammophila rubripes* SPINOLA 1839: 465, ♀. Lectotype: ♀, Egypt: no specific locality (TORINO), designated by DE BEAUMONT 1952: 45, photograph examined.

*Ammophila propinqua* TASCHENBERG 1869: 433, ♂. Holotype or Syntypes: ♂, Sudan: Khartum (HALLE). Synonymized with *Ammophila rubripes* by GUIGLIA 1948: 32, synonymy confirmed by DE BEAUMONT 1952: 45.

*Ammophila syriaca* MOCSÁRY 1883: 30, ♀. Holotype: ♀, Syria: no specific locality (TMB). Synonymized with *Ammophila propinqua* by KOHL 1906: 363, not examined.

*Ammophila dantoni* ROTH in NADIG 1933: 101, ♀ only. Paratype: ♀, Morocco: Marrakech (ZÜRICH), examined, **new synonym**.

**Material examined**: lectotype photograph ♀ (TORINO). 32 ♀♀, 32 ♂♂ (OÖLM), 20 ♀♀, 7 ♂♂ (NHMW), 3 ♀♀, 10 ♂♂ (coll. Schmid-Egger).

**Note**: The male described by ROTH in NADIG (1933: 101) as *Ammophila dantoni* is conspecific with *Ammophila erminea* KOHL 1901.

**Recognition**: *Ammophila rubripes* has the gastral apex black without metallic shine, but in most specimens pruinose, the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron. Additionally, the scutum is transversely striate and punctate and the head, the thorax and the propodeum are covered with appressed silvery setae. The female is similar to *A. erminea* but differs in having the scutum with transverse striae and punctures between them and a pronotal collar in many specimens all or partly yellowish-brown. The female of *A. heydeni* differs from *A. rubripes* in having the metapleuron not covered or distinctly less covered with appressed silvery setae than the mesopleuron. The male of *A. rubripes* is similar to *A. erminea* but differs in having the scutum transversely striate and the penis valve distinctly narrowed basally in apical view (Fig. 567) (*A. erminea* has the scutum punctate and the penis valve not distinctly narrowed in apical view). The male of *A. guichardi* differs from *A. rubripes* in having the scutum punctate and differently shaped genitalia. The male of *A. heydeni* is similar to *A. rubripes* but differs in having the metapleuron with no or extremely sparse appressed, silvery setae and the penis valve basally not narrowed in apical view (fig. 565).

**Description**: Gastral apex black, without metallic shine, but in most specimens pruinose, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia distinct, claws without basal tooth. Scutum transversely striate and punctate.

♀: 17.5-23.5 mm. Black, with following extremely variable yellowish-brown: mandible (except apex), ventral half of clypeus, scape, pronotal collar (varying from all yellowish-brown to all black), pronotal lobe, tegula, petiole (partly darkened), tergum I (in some specimens with dorsal black stripe), terga II-III (variable), sterna II-V, legs (variable). Head, thorax, propodeum and hindcoxa dorsally covered with appressed silvery setae; setae sparser on pronotal collar, scutum and pronotal enclosure; erect setae silvery-white. Clypeus elongate (Fig. 37), ventral one-third not covered with appressed silvery setae, sparsely punctate, disk distinctly convex (Fig. 85). Pronotal collar sparsely, finely punctate; scutellum slightly longitudinally striate and punctate. Propodeal enclosure transversely striate and all covered with long, white, erect setae, mesopleuron and metapleuron punctato-rugose. Pronotal collar laterally: Fig. 179. Flagellomere I: II=1.6-1.9; length of petiole = hindtarsomeres I+0.5×II to I+II+0.5×III.

♂: 17.5-22 mm. Black, with yellowish-brown color extremely variable, as in females.



Head (except vertex), thorax and propodeum uniformly covered with appressed silvery setae that in most specimens do not obscure underlying sculpture; erect setae white. Clypeus elongate and median lobe straight (Fig. 220), disk convex. Pronotal collar sparsely punctate; scutellum longitudinally striate and punctate. Propodeal enclosure transversely rugose and covered with sparse, appressed setae and silvery-white erect setae. Genitalia: penis valve laterally: Fig. 448, ventrally: Fig. 513, apically distinctly narrowed basally: Fig. 567, gonostyle broad basally but sharply narrowing to form acute apical end: Fig. 378. Flagellomere I: II=1.4-1.5; length of petiole = hindtarsomeres I+II+0.5×III to I+II+III.

**Geographical distribution:** Jordan, Israel, Egypt, Syria, Arabian Peninsula, Africa.

***Ammophila sabulosa* (LINNAEUS) (Figs 20, 62, 155, 227, 387, 473, 531, 589)**

*Sphex sabulosa* LINNAEUS 1758: 569, sex not indicated. **Lectotype:** ♂, Europe: no specific locality (Zool. Society London), designated by DAY 1979: 72, not examined.

*Sphex hortensis* PODA 1761: 106. Not available.

*Ichneumon frischii* GEOFFROY in FOURCROY 1785: 415, sex not indicated. **Holotype or syntypes:** France: Paris (lost). Synonymized with *Ammophila sabulosa* by KOHL 1906: 336.

*Sphex dimidiatus* CHRIST 1791: 313. Junior primary homonym of *Sphex dimidiatus* DE GEER 1773. Synonymized with *Ammophila sabulosa* by KOHL 1906: 336.

*Ammophila vulgaris* W. KIRBY 1798: 202, ♀. **Syntypes:** ♀, Great Britain: SUFFOLK and NORFOLK (deposit). Not available: published as junior synonym of *Sphex sabulosa* LINNAEUS 1758. Synonymized with *Ammophila sabulosa* by LEPELETIER DE SAINT FARGEAU 1845: 377.

*Ammophila pulvillata* SOWERBY 1805: 67, ♂. **Holotype or syntypes:** Great Britain: Berkshire County: Reading (depository?). Synonymized with *Ammophila sabulosa* by MENKE in BOHART & MENKE 1976: 153.

*Sphex mucronatus* JURINE 1807: 128 and pl.8, Fig. 5, ♀. **Holotype or syntypes:** ♀, Europe, probably Switzerland (MHNG), not examined. Synonymized with *Ammophila sabulosa* by FREI-GESSNER, KOHL & KRIECHBAUMER 1882: 393.

*Ammophila cyanescens* DAHLBOM 1845: 430, sex not indicated. **Holotype:** ♂, Germany: Glogau, now Poland: Głogów (Lund), not examined. Synonymized with *Ammophila sabulosa* by DE BEAUMONT 1953: 194.

*Ammophila vischu* CAMERON 1889: 98, ♀, ♂. **Syntypes:** India: Uttar Pradesh: Mussoorie and Pakistan: North-west Province: no specific locality (OXUM). A questionable synonym of *Ammophila sabulosa* (BOHART & MENKE 1976: 153).

*Ammophila sabulosa kamtschatica* GUSSAKOVSKIJ 1932: 4, ♀. **Syntypes:** ♀, Russia: Kamchatka: Elisovo (Stockholm), not examined. Synonymized with *Ammophila sabulosa* by NEMKOV in NEMKOV, KAZENAS, BUDRYAS & ANTROPOV 1995: 388.

**Material examined:** 119♀♀, 265♂♂ (OÖLM), 4♀♀ (BMNH), 4♂♂ (ZMHU), 2♀♀, 14♂♂ (coll. Schmid-Egger).

**Recognition:** *Ammophila sabulosa* has the gastral apex with a dark-blue or dark-green metallic shine (in some specimens hard to see), the supra-antennal lamellate projection slightly developed (Fig. 20), the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron. Additionally, the scutum is dull, irregularly punctate and the propodeal enclosure is all covered with erect setae. The scutellum is longitudinally ridged and the petiole is black. The female of *A. sickmanni* differs from *A. sabulosa* in having the supra-antennal lamellate projection well developed (Fig. 19), the gastral apex without a metallic shine, the scutum distinctly transversely ridged and punctate and the propodeal enclosure broadly rugose and covered with erect setae along the midline, transversely ridged and

glabrous laterally. The Indian females of *A. brevipennis* differ from *A. sabulosa* in having a gastral apex without a metallic shine, the free margin of the clypeus without median lobe (Fig. 56), the scutellum punctate on anterior half, longitudinally striate on posterior half, a red gastral petiole and the propodeal enclosure glabrous laterally. Both sexes of *A. assimilis* differ from *A. sabulosa* in having the gastral apex without metallic shine, the pronotal collar smooth and shiny and the scutum shiny with distinct, transverse striae. The female of *A. modesta* is similar to *A. sabulosa* but differs in having the gastral apex without metallic shine. The Indian females of *A. punctata* differ from *A. sabulosa* in having the gastral apex without a metallic shine and the scutum densely, coarsely punctate (punctures 0-1 diameter apart). Both sexes of *A. infesta* are similar to *A. sabulosa* but differ in having a more developed supra-antennal lamellate projection (more than the diameter of midocellus) and the propodeal enclosure obliquely ridged, covered with white, erect setae medially and glabrous laterally. The male of *A. sabulosa* differs from *A. modesta* in having the gastral apex with a metallic shine, in the shape of the penis valve (Fig. 473) and in the shape of the clypeus (Fig. 227). The male of *A. sickmanni* differs from *A. sabulosa* in having the gastral apex without metallic shine, the supra-antennal lamellate projection more developed (Fig. 19) and in the shape of the clypeus (Fig. 214), additionally, the propodeal enclosure irregularly rugose and covered with erect setae along the midline and obliquely rugose and glabrous laterally.

**Description:** Gastral apex with dark-blue or dark-green metallic shine (in some specimens hard to see), supra-antennal lamellate projection slightly developed (Fig. 20), mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia well developed, claws without basal tooth.

♀: 14-24.5 mm. Black except tergum I (except basally), gastral segment II, sternum II and anterior half of tergum III red (in some specimens tergum III all red). Pronotal lobe, broad band along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae. In some specimens clypeus and frons also covered with appressed silvery setae or mesopleuron has none; erect setae brown or grey. Clypeus slightly elongate, median lobe delimited laterally by more or less developed tooth (Fig. 62), disk convex, dull and sparsely punctate. Vertex dull and sparsely punctate. Pronotal collar finely, sparsely punctatedorsally (Fig. 155), pronotum laterally transversely striate. Scutum dull, irregularly, slightly punctate, laterally finely transversely striate, admedian line well defined; scutellum longitudinally ridged. Mesopleuron dull, punctate, in some specimens slightly transversely rugose and propodeum punctato-rugose laterally. The propodeal enclosure is obliquely striate and all covered with erect setae. Flagellomer I: II=1.5-1.7; length of petiole = hindtarsomeres I+0.5×II to I+0.75×II.

♂: 15-20.5 mm. Black except tergum I, gastral segment II (both in most specimens with dorsal black stripe) and basal half of segment III red. Clypeus, frons and pronotal lobe covered with appressed, silvery setae; in some specimens mesopleuron, metapleuron and propodeum laterally sparsely covered with short, appressed, silvery setae. Clypeus slightly elongate, free margin slightly emarginate (Fig. 227), disk nearly flat. Vertex dull, sparsely punctate. Pronotal collar dull, sparsely punctate, anterior surface in some specimens slightly transversely striate, and pronotum laterally transversely striate. Scutum dull, irregularly punctate, in some specimens transversely punctato-rugose and scutellum and metanotum longitudinally ridged. Propodeal enclosure irregularly obliquely ridged, all covered with erect setae. Mesopleuron, metapleuron and propodeum

laterally punctato-rugose. Gonostyle laterally: Fig. 387; penis valve laterally: Fig. 473, ventrally: Fig. 531, apically: Fig. 589. Flagellomere I:  $II=1.3-1.5$ ; length of petiole = hindtarsomeres  $I+0.5 \times II$  to  $I+II+0.25 \times III$ .

**Geographical distribution:** Europe, Turkey, Iran, Central Asia, Mongolia.

***Ammophila sarekandana* BALTHASAR**

*Ammophila sarekandana* BALTHASAR 1957: 192, ♀. Holotype: ♀, Afghanistan: Badakhshan: Sarekanda (NMPC), examined.

*Ammophila afghanica* BALTHASAR 1957: 190, ♂ only. Allotype: ♂, Afghanistan: Badakhshan: Sarekanda (NMPC), examined.

**Material examined:** Kyrgyzstan: Oshskaya Oblast District Dchon-Alaisky Alai Mountains 39°31'02"N 71°40'57"E, 2500-2800m (1♂ OÖLM), SW Slope Alai Ok-Su river (2♂♂ OÖLM), Sary-Tchelek reserve 1500m (1♀ OÖLM). Tajikistan: Rogun Surchob riv. Sigiry (1♂ OÖLM). Uzbekistan: Kugitangtau-Mt. 1500m Shalkan Gorge (1♂ coll. Jacobs).

**Note:** The male described by BALTHASAR (1957: 190) as *Ammophila afghanica* is conspecific with *Ammophila sarekandana* BALTHASAR 1957.

**Recognition:** *Ammophila sarekandana* has the submarginal cell III petiolate, the gastral apex black without a metallic shine, the propodeum enclosure glabrous and the supra-antennal lamellate projection well developed. In addition, the mesothoracic venter is not prominent anteriorly and the episternal sulcus extends to the anteroventral margin of the pleuron. The petiole has no erect setae ventrally, the scutum is transversely striate and the mesopleuron has no appressed silvery setae. The female is similar to *A. deserticola* and shares with this species a well developed supra-antennal lamellate projection, but differs in having the scutum with distinct, transverse striae and the mesopleuron without a patch of appressed silvery setae. The female of *A. pubescens* differs from *A. sarekandana* in having the supra-antennal lamellate projection absent, the petiole with erect setae ventrally, the scutum dull, transversely microstriate and the propodeal enclosure obliquely striate and micropunctate. The female of *A. campestris* differs from *A. sarekandana* in having the supra-antennal lamellate projection absent, the mesopleuron covered with appressed silvery setae and brown erect setae on the head. The male of *A. deserticola* shares with *A. sarekandana* a well developed supra-antennal lamellate projection, but differs in having the scutum finely, transversely striate and nearly impunctate. The male of *A. pubescens* differs from *A. sarekandana* in having the supra-antennal lamellate projection absent, the scutum dull and transversely microstriate, a dorsal black stripe on terga I and II and the propodeal enclosure obliquely striate and micropunctate. The male of *A. campestris* differs from *A. sarekandana* in having the supra-antennal lamellate projection absent, the scutum dull and finely transversely striate and the mesopleuron with a patch of appressed silvery setae.

**Description:** Submarginal cell III petiolate, gastral apex black, without metallic shine, propodeal enclosure glabrous and supra-antennal lamellate projection well developed. Mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia well defined and claws without basal tooth.

♀: 14.5-16.5 mm. Black except tergum I, gastral segment II and basal half of III red. Propodeum posterolaterally covered with appressed silvery setae and hindcoxa pruinose. Erect setae on head black, on thorax and propodeum laterally brown to whitish. Clypeus slightly elongate, disk distinctly convex. Pronotal collar nearly impunctate dorsally,

striate laterally. Scutum transversely striate on anterior half, obliquely striate on posterior half, admedian line well defined. Scutellum longitudinally striate and coarsely punctate. Mesopleuron irregularly, slightly, transversely rugose and distinctly punctate, metapleuron and propodeum laterally irregularly, obliquely rugose. Propodeal enclosure obliquely striate, shiny, glabrous. Petiole ventrally without erect setae. Flagellomere I:  $II=1.8$ ; length of petiole = hindtarsomeres  $I+0.25 \times II$ .

♂: 14-16.5 mm. Black except tergum I and gastral segment II red. Clypeus and frons covered with appressed, silvery setae, in some specimens also propodeum posterolaterally; erect setae brownish. Clypeus elongate, disk nearly flat. Pronotal collar dorsally sparsely, coarsely punctate, lateral lobes transversely striate. Scutum distinctly, transversely striate and coarsely punctate, on posterior half more obliquely striate, admedian line well defined; scutellum longitudinally striate. Propodeal enclosure irregularly, obliquely striate, shiny and glabrous. Mesopleuron dull, coarsely punctate, in some specimens punctato-rugose, metapleuron and propodeum laterally punctato-rugose. Sterna VII and VIII covered with appressed brownish setae. Flagellomere I:  $II=1.5-1.7$ ; length of petiole = hindtarsomeres  $I+0.75 \times II$  to  $I+II+0.5 \times III$ . Genitalia not examined.

**G e o g r a p h i c a l   d i s t r i b u t i o n :** Afghanistan (3800m), Kyrgyzstan, Tajikistan, Uzbekistan.

***Ammophila sareptana* KOHL (Figs 75, 170, 240, 292, 425, 491, 546, 597)**

*Ammophila sareptana* KOHL 1884: 378, ♂. **Lectotype:** ♂, Russia: Sarepta, now Krasnoarmeysk near Volgograd (NHMW), examined, **present designation.**

**M a t e r i a l   e x a m i n e d :** **Lectotype** ♂, 1♂ (NHMW), 7♀♀, 9♂♂ (OÖLM), 1♂ (coll. Schmid-Egger).

**R e c o g n i t i o n :** *Ammophila sareptana* has a glabrous propodeal enclosure, the submarginal cell III not petiolate, the episternal sulcus extending to the anteroventral margin of the pleuron and the supra-antennal lamellate projection absent. Additionally, the mesothoracic venter is not prominent anteriorly and the gaster apex is black, in most specimens with a slight metallic shine. The female of *A. adelpha* differs from *A. sareptana* in having the episternal sulcus ending at the level of the scrobe and a characteristically elongate clypeus with a deep emargination medially (Fig. 74). The female of *A. sareptana* shares with *A. terminata* the glabrous propodeal enclosure, but differs in having a different pattern of appressed silvery setae and a more coarsely rugose propodeal enclosure. The male of *A. sareptana* differs from all other species in having characteristically shaped penis valve and gonostyle.

**D e s c r i p t i o n :** Propodeal enclosure glabrous, episternal sulcus extending to anteroventral margin of pleuron, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, arolia distinctly developed and claws without basal tooth. Gaster apex black, in most specimens with slight metallic shine.

♀: 17-22 mm. Black except petiole, tergum I and gastral segments II-III (IV) red (in some specimens these partly black). Following covered with dense appressed silvery or brassy setae: dorsal half of clypeus, two lateral spots on upper frons, pronotal lobe, large spot on mesopleuron, posterolateral surface of propodeum and hindcoxa. Pronotal collar and scutum covered with fine, short appressed setae that do not obscure underlying sculpture; metapleuron without appressed setae. Erect setae on head, prothorax and foreleg black nearly as long as scape, on mesopleuron and propodeum laterally white and

short. Clypeus slightly elongate, median lobe with lateral tooth (Fig. 75), disk markedly convex. Pronotal collar dorsally not striate, pronotum laterally transversely striate. Scutum transversely, scutellum longitudinally striate. Propodeal enclosure irregularly, coarsely transversely striate (distinctly more so than in *A. terminata*), mesothoracic venter coarsely transversely rugose. Flagellomere I:  $II=1.7-2.1$ ; length of petiole = hindtarsomeres  $I+0.5 \times II$  to  $I+0.75 \times II$ .

♂: 17-20 mm. Black except terga I-III (IV) red, petiole in most specimens black. Clypeus, frons, pronotal lobe, mesopleuron and propodeum posterolaterally covered with appressed silvery or brassy setae. Pronotal collar, scutum, mesothoracic venter and legs covered with fine, short, appressed silvery setae. Mandible broad, clypeus slightly elongate, medially emarginate (Fig. 240), disk with conspicuous gibbosity basally. Pronotal collar microstriate, pronotum laterally transversely striate. Scutum transversely, scutellum longitudinally striate. Propodeal enclosure coarsely transversely rugose; mesothoracic venter dull, sparsely punctate. Pronotal lobe laterally: Fig. 292. Genitalia large (2 mm) and characteristically shaped: gonostyle laterally: Fig. 425; penis valve laterally: Fig. 491, ventrally: Fig. 546, apically: Fig. 597. Sternum VIII emarginate apically. Flagellomere I:  $II=1.6-2.0$ ; length of petiole = hindtarsomeres  $I+0.75 \times II$  to  $I+II+0.3 \times III$ .

**Geographical distribution:** Turkey, Russia, Ukraine, Kazakhstan, Kyrgyzstan.

***Ammophila schmideggeri* DOLLFUSS nov.sp. (Figs 68, 97, 133, 163, 235, 286, 323, 356, 420, 541, 594)**

**Records:** Holotype: ♀: Israel: Negev, 45 km S Beer Sheva, 5 km SSE Sede Boqer, Wadi N'Aqef, 34°48'N 30°49'E, 12. V.1996, leg. O. Niehuis (coll. Schmid-Egger). Paratype: Israel: 45 km SE Beer Sheva, Mezad Aqrabbim, 35°08'N 30°57'E, 8. V.1996, leg. Schmid-Egger (1 ♂ coll. Schmid-Egger).

**Name derivation:** In honor of the collector, Dr. Christian Schmid-Egger, Berlin, Germany.

**Recognition:** *Ammophila schmideggeri* is characterized by a coarsely transversely ridged pronotal collar, the episternal sulcus ending at the level of the scrobe, the mesothoracic venter not prominent anteriorly, the supra-antennal lamellate projection absent and the wings hyaline. The female of *A. schmideggeri* differs from *A. panti*, *A. haimatosoma* and *A. clavus* in having a flat clypeal disk (Fig. 97), the median lobe of the clypeus with two erect teeth (Fig. 68) and small but distinctly developed arolia (*A. panti*, *A. haimatosoma* and *A. clavus* have no arolia). The males of *A. panti*, *A. haimatosoma* and *A. clavus* differ from *A. schmideggeri* in having a gonostyle not abruptly narrowing to the apical end (Figs 421, 422, 423) and characteristically shaped penis valves in apical view (Figs 591, 592, 593).

**Description:** Pronotal collar coarsely transversely ridged, episternal sulcus ending at level of scrobe, mesothoracic venter not prominent anteriorly, supra-antennal lamellate projection absent, wings hyaline, claws without basal tooth. Propodeal enclosure coarsely transversely ridged, broadly covered with fine appressed silvery setae along midline, glabrous laterally.

♀: 18 mm. Black, with following yellowish-brown: mandible (except apex), free margin of clypeus, scape, pedicel (ventrally), pronotal collar, pronotal lobe, tegula, fore- and

midlegs, hindlegs (except coxa and trochanter dorsally), propodeal enclosure laterally, petiole and petiole socket, tergum I and gastral segments II-VI (IV-VI dorsally darkened); all femora dorsally, hindtibia ventrally and hindtarsomere I darkened. Head (except vertex), thorax laterally and ventrally and propodeum laterally covered with appressed silvery setae. Pronotal collar, scutum, scutellum, legs (partly) and gaster (partly) pruinose. Silvery-white, erect setae only on head, pronotum and foreleg. Clypeus slightly elongate, median lobe laterally with erect tooth (Fig. 68), disk flat (Fig. 97). Pronotal collar (Figs 133, 163) and scutum coarsely, transversely ridged, scutellum and metanotum longitudinally ridged. Mesopleuron and propodeum laterally with coarse, transverse rugae. Arolia small but distinct, foretarsomeres asymmetrical, with slender spines. Flagellomere I: II=1, 7; length of petiole = hindtarsomeres I+II.

♂: 14.5 mm. Black, with following yellowish-brown: mandible (except apex), clypeus next to free margin, pronotal collar, pronotal lobe, tegula, foreleg (femur dorsally darkened), midleg (trochanter and femur dorsally and tarsus darkened), hindleg (coxa, trochanter, femur dorsally, tibia ventrally and tarsomeres darkened), petiole and petiole socket, tergum I (dorsally darkened), terga II and basal half of III, sterna II-IV. Head (except vertex), thorax laterally and propodeum laterally covered with appressed silvery setae. Pronotal collar, scutum, scutellum and legs pruinose. White erect setae on head and prothorax nearly as long as flagellomere I, on mesopleuron and propodeum laterally shorter. Clypeus broadly elongate (Fig. 235), disk slightly concave (Fig. 356). Pronotal collar and scutum coarsely transversely ridged, scutellum coarsely longitudinally ridged. Mesopleuron, metapleuron and propodeum laterally coarsely, obliquely rugose. Arolia distinct. Pronotal collar laterally: Fig. 286, dorsally: Fig. 323. Gonostyle laterally: Fig. 420; penis valve ventrally: Fig. 541, apically: Fig. 594. Flagellomere I: II=2.0; length of petiole = hindtarsomeres I+II+0.3×III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Israel.

***Ammophila separanda* F. MORAWITZ (Figs 80, 102, 296, 429, 493, 550, 600)**

*Ammophila separanda* F. MORAWITZ 1891: 204, ♀, ♂. European Kazakhstan: Ryn-Peski (ZIN),  
Syntypes: ♀, ♂, examined.

**M a t e r i a l e x a m i n e d :** 34♀♀, 69♂♂ (OÖLM), 2♀♀ (coll. Schmid-Egger).

**R e c o g n i t i o n :** *Ammophila separanda* has a submarginal cell III petiolate, the gastral apex black without metallic shine and the propodeum enclosure glabrous. Additionally, the supra-antennal lamellate projection is absent, the mesothoracic venter not prominent anteriorly, the episternal sulcus extends to the anteroventral margin of the pleuron, the arolia are well developed and the claws have no basal tooth. The female of *A. separanda* differs from *A. campestris* in having the scutum distinctly, transversely striate, a red petiole, distinct appressed silvery setae on the clypeus and the clypeal median lobe delimited by small teeth (*A. campestris* has a dull scutum at most finely transversely striate laterally, the clypeus without dense appressed silvery setae and in most specimens a clypeus without median lobe). The female of *A. pubescens* differs from *A. separanda* in having the petiole ventrally with distinct erect setae and the propodeal enclosure obliquely striate and micropunctate (*A. separanda* has no erect setae on the petiole ventrally and the propodeal enclosure is shiny). The male of *A. campestris* differs from *A. separanda* in having the scutum dull and transversely microstriate and a differently shaped penis valve. The male of *A. pubescens* differs from *A. separanda* in



having terga I and II with a black stripe, the scutum dull and transversely microstriate and in many specimens the petiole ventrally with distinct erect setae.

**Description:** Submarginal cell III petiolate, gastral apex black, without metallic shine and propodeum enclosure glabrous. Supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia well developed, claws without basal tooth.

♀: 15.5-18.5 mm. Black except petiole, tergum I, gastral segments II, III and basal one third of IV red. In some specimens basal half of petiole black. Clypeus, lower part of frons, pronotal lobe, mesopleuron, propodeum posterolaterally and mid- and hindcoxa dorsally covered with appressed silvery setae; erect setae yellowish-brown or whitish. Clypeus slightly elongate, median lobe in most specimens delimited by small tooth (Fig. 80), disk distinctly convex (Fig. 102). Pronotal collar dorsally sparsely punctate and lateral lobes slightly transversely striate. Scutum shiny or slightly dull and distinctly transversely or obliquely striate, sparsely punctate; scutellum longitudinally striate. Mesopleuron, metapleuron and propodeum laterally dull and punctato-rugose. Propodeal enclosure obliquely, finely striate, interspace shiny. Flagellomere I: II=1.6-2.0; length of petiole = hindtarsomeres I+0.3×II to I+II.

♂: 14-19 mm. Black except tergum I and gastral segments II and III red. In some specimens petiole partly or all red. Clypeus, frons, pronotal lobe, mesopleuron (nearly all) and propodeum posterolaterally covered with appressed silvery setae. Clypeus elongate, disk flat on ventral half, convex on dorsal half. Pronotal collar dull, sparsely punctate, lateral lobes transversely striate, scutum dull or shiny, distinctly transversely striate, sparsely punctate; scutellum longitudinally striate. Propodeal enclosure obliquely striate, with shiny interspaces. Mesopleuron dull, sparsely punctate, metapleuron and propodeum laterally obliquely punctato-rugose. Genitalia: penis valve in apically view slender, nearly parallel: Fig. 600, in lateral view: Fig. 493, ventrally: Fig. 550; gonostyle laterally: Fig. 429. Flagellomere I: II=1.5-1.9; length of petiole = hindtarsomeres I+0.5×II to I+II.

**Geographical distribution:** Azerbaijan, Kazakhstan, Turkmenistan.

***Ammophila sickmanni* KOHL (Figs 19, 51, 147, 214, 278, 349, 401, 471, 529, 582)**

*Ammophila sickmanni* KOHL 1901: 151, ♀. Lectotype: ♀, China: Tientsin, Kalgan (NHMW), examined, **present designation**.

*Ammophila sickmanni wusheensis* TSUNEKI 1967: 16, ♀, ♂, Taiwan: Nanton Prefecture: Chienching (USNM), examined.

*Ammophila subassimilis* STRAND 1913: 86, ♀, ♂. Lectotype: ♀, Taiwan: Taihorin (DEI), examined, **present designation, new synonym**.

*Ammophila sjoestedti* GUSSAKOVSKIJ 1934: 6, ♀, junior primary homonym of *Ammophila sjoestedti* CAMERON 1910. Holotype: ♀, China: Gansu Province: no specific locality (NRS), examined, **new synonym**.

**Material examined:** Lectotype ♀ (NHMW), 1 ♀ (NHMW), 9 ♀♀, 8 ♂♂ (OÖLM), 1 ♀, 5 ♂♂ (ZMHU).

**Recognition:** *Ammophila sickmanni* has the gastral apex black without metallic shine, a well developed supra-antennal lamellate projection (Fig. 19), the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron. The female is similar to *A. sabulosa* but differs in having a more developed supra-antennal lamellate projection (Fig. 19), the gastral apex without metallic

shine and the scutum transversely ridged (*A. sabulosa* has a slightly developed supra-antennal lamellate projection (Fig. 20), the gastral apex with metallic shine and the scutum not transversely ridged). The female of *A. infesta* differs in having the gastral apex black with a metallic shine and the scutum not distinctly transversely ridged. The female of *A. vagabunda* differs from *A. sickmanni* in having the gastral apex with a metallic shine and the scutum and the mesopleuron rugose, coarsely punctate, the punctures partly confluent. The male of *A. sickmanni* is similar to *A. sabulosa* but differs in having a more developed supra-antennal lamellate projection (Fig. 19), the clypeus anteriorly more emarginate (Fig. 214) and the gastral apex without metallic shine. The male of *A. infesta* differs from *A. sickmanni* in having the scutum finely and more or less evenly punctate, the punctures limited, not confluent and in most specimens the gastral apex with a metallic shine.

**Description:** Gaster apex black, without metallic shine, supra-antennal lamellate projection well developed (Fig. 19), mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia distinct and claws without basal tooth.

♀: 14-21 mm. Black except tergum I and gastral segment II red. Pronotal lobe posteriorly, small band along mesopleural suture and small spot on propodeum posterolaterally covered with appressed silvery setae; in some specimens also clypeus. Clypeus slightly elongate, in most specimens shiny and sparsely punctate, median lobe laterally delimited by small tooth (Fig. 51), disk convex. Pronotal collar sparsely punctate, pronotum laterally transversely striate (Fig. 147). Scutum distinctly transversely ridged, coarsely punctate and scutellum longitudinally striate. Propodeal enclosure irregularly rugose, covered with erect setae medially, transversely striate and glabrous laterally. Mesopleuron irregularly transversely rugose and punctate. Flagellomere I: II=1.4-1.6; length of petiole = hindtarsomeres I+0.5×II to I+II.

♂: 15-19.5 mm. Black except tergum I, gastral segment II all and III basally red, both in most specimens with narrow dorsal stripe. Clypeus, frons, pronotal lobe, small band along mesopleural suture and small spot on propodeum posterolaterally covered with appressed silvery setae. Thorax and propodeum laterally pruinose. Clypeus elongate, free margin distinctly emarginate (Fig. 214), disk nearly flat, in most specimens ventral part inclined at its apicomedian area into glabrous and polished bevel (Fig. 349). Pronotal collar punctate (punctures 0-2 diameters apart), and pronotum laterally slightly transversely striate. Scutum coarsely transversely ridged and punctate, scutellum longitudinally ridged and punctate. Propodeal enclosure broadly rugose-striate medially, covered with erect setae, without distinct median carina, small lateral part obliquely striate and glabrous. Gonostyle laterally: Fig. 401; penis valve laterally: Fig. 471, ventrally: Fig. 529, apically: Fig. 582. Flagellomere I: II=1.3-1.5; length of petiole = hindtarsomeres I+II to I+II+0.5×III.

**Geographical distribution:** China, Korea, Mongolia.

***Ammophila sinensis* SICKMANN (Figs 63, 128, 158, 253, 258, 370, 440, 507, 561, 606)**

*Ammophila sinensis* SICKMANN 1894: 17, ♀. **Lectotype:** ♀, China: Hopei Province: Tientsin (NHMW), examined, **present designation.**

*Ammophila planicollaris* LI & YANG 1990: 259, ♂. **Holotype:** ♂, China: Nei Mongol: Jungar Banner, Ih Ju Leage: Mt. Shesan (Beijing Agricultural University), not examined, **New synonym.**

**Material examined:** Lectotype ♀ (NHMW); China: Xienxian Zhontiao Shant mt. 34.8°N 111.6°E (1♂ OÖLM), 10 km E Longmen 35.6°N 111.1°E (1♂ OÖLM). Mongolia: 200 km SSE Baruun-Urt Moltsoy Els 1200m (2♀♀, 1♂ OÖLM), 100 km SSE Baruun-Urt 1100m (2♀♀ OÖLM), 100 km NE Ondorkhaan Kherlen riv. 970m (2♂♂ OÖLM), 100 km W Choibalsan 820m, (2♂♂ OÖLM), 75 km W Ulaanbaatar dunes (2♂♂ OÖLM).

**Recognition:** *Ammophila sinensis* has the gastral apex black without metallic shine, the pronotal collar and the scutum coarsely transversely ridged and the episternal sulcus extending to the anteroventral margin of the pleuron (in some specimens indistinct developed). Additionally, the mesothoracic venter is concave anteriorly for the reception of the forecoxa, the depression is margined by a carina that forms one projection on each side, the supra-antennal lamellate projection is absent and the erect setae are white. The female of *A. striata* differs from *A. sinensis* in having the mesothoracic venter anteriorly not distinctly prominent, but with a transverse carina without projections. The female of *A. gracillima* differs from *A. sinensis* in having red legs and a propodeal enclosure all covered with appressed silvery setae. Both sexes of *A. occipitalis* differ from *A. sinensis* in having red legs. The female of *A. elongata* differs from *A. sinensis* in having red legs and a pronotal collar with a wide triangular antero-medial concavity which intersects the anterior transverse carina (Fig. 131). The male of *A. elongata* differs from *A. sinensis* in having the anterior margin of the pronotal collar distinctly emarginate (Fig. 319) and the episternal sulcus ending at the level of the scrobe. The male of *A. gracillima* differs from *A. sinensis* in having red legs, the propodeal enclosure all covered with appressed silvery setae and by the shape of gonostyle laterally (Fig. 418).

**Description:** Gaster apex black, without metallic shine, pronotal collar and scutum coarsely, transversely ridged, episternal sulcus extending to anteroventral margin of pleuron (in some specimens indistinctly developed), mesothoracic venter concave anteriorly for reception of forecoxa, depression margined by carina that forms one small projection on each side. Supra-antennal lamellate projection absent, arolia distinctly and claws without basal tooth, erect setae white.

♀: 15.5-18.5. Black except tergum I (except basal part), gastral segments II and III red (in some specimens III black posteriorly). Clypeus (except lower one-third), frons, pronotal lobe, band along mesopleural suture, propodeum posterolaterally and mid- and hindcoxa dorsally covered with appressed silvery setae; remaining areas of thorax, propodeum and legs more or less pruinose. Clypeus slightly elongate (Fig. 63), disk distinctly convex, lower one-third flat, smooth, shiny, sparsely punctate. Frons, vertex and gena dull and nearly impunctate. Pronotal collar distinctly transversely ridged, elongate and pruinose (Figs 128, 158). Scutum transversely ridged, sparsely punctate, admedian line distinctly; scutellum longitudinally ridged. Propodeal enclosure covered with fine appressed silvery setae, reticulate along midline, obliquely, coarsely rugose and glabrous laterally. Flagellomere I: II=2.0-2.4; length of petiole = hindtarsomeres I+0.75xII to I+II.

♂ (hitherto unknown): 14-18 mm. Black except tergum I (black basally) and gastral segments II and III (apically black) red. Clypeus, frons, pronotal lobe, band along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae, remaining areas of thorax and legs pruinose. Clypeus elongate, free margin truncate or slightly emarginate (Fig. 253), disk flat on ventral half, slightly convex on dorsal half (Fig. 370). Scutum coarsely transversely rugose-striate and punctate, scutellum coarsely longitudinally ridged. Mesopleuron and metapleuron coarsely punctate (punctures 0-2

diameters apart) and propodeum laterally coarsely obliquely rugose. Propodeal enclosure coarsely reticulate, covered with fine appressed silvery setae along midline, coarsely obliquely striate and glabrous laterally. Pronotal collar laterally: Fig. 258. Gonostyle laterally: Fig. 440, penis valve laterally: Fig. 507, ventrally: Fig. 561, apically: Fig. 606. Flagellomere I:  $II=2.0-2.2$ ; length of petiole = hindtarsomeres I+II to I+II+0.5×III. See also Figs 716-724 from the original description of *A. planicollaris* LI & YANG 1990: 259.

**G e o g r a p h i c a l d i s t r i b u t i o n :** China, Mongolia.

***Ammophila smithii* F. SMITH (Figs 34, 107, 119, 192, 248, 303, 366, 435, 502, 558, 605, 612)**

*Ammophila smithii* F. SMITH 1856: 217, ♀. (authorship attributed to Baly). Holotype or syntypes: ♀, India: no specific locality (probably lost, not in BMNH).

**M a t e r i a l e x a m i n e d :** Pakistan: Quetta (2♀ ♀, 1♂ ♂ BMNH), Karachi (2♂ ♂ BMNH).

**R e c o g n i t i o n :** *Ammophila smithii* has the gastral apex black without metallic shine, the supra-antennal lamellate projection absent, the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron. The male of *A. pakistana* is similar to *A. smithii* but differs in having the clypeus more broadly elongate (Fig. 252) and the propodeal enclosure is covered with dense appressed silvery setae along midline, distinctly transversely striate and glabrous laterally.

**D e s c r i p t i o n :** Gastral apex black, without metallic shine, supra-antennal lamellate projection absent, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia well developed, claws without basal tooth.

♀: 14-16 mm. Black, with following variably yellowish-brown: mandible (except apex), free margin of clypeus, scape, tegula, legs (except coxa), tergum I (black basally) and gastral segments II-IV. Clypeus, frons, thorax, propodeum and hindcoxa covered with appressed silvery setae that obscure most of underlying sculpture; erect setae silvery-white. Clypeus slightly elongate (Fig. 34), disk nearly flat (Fig. 107). Vertex and pronotal collar shiny and nearly impunctate, scutum also shiny and sparsely punctate (punctures 1-3 diameters apart); scutellum punctate, longitudinally striate. Propodeal enclosure irregularly rugose along midline, obliquely striate laterally, all covered with appressed silvery setae and white erect setae. Foretarsal rake with slender hyaline spines. Pronotal collar dorsally: Fig. 119, laterally: Fig. 192. Flagellomere I:  $II=1.6-1.7$ ; length of petiole = hindtarsomeres I+II+0.25×II to I+II+0.5×III.

♂: 14-17 mm. Black, with following variably yellowish-brown: mandible (except apex), tegula, fore- and midlegs (except coxae), hindlegs (except coxa and trochanter), tergum I (except dorsal black stripe), gastral segment II (except dorsal stripe); segments III-VII more or less black. Head, thorax and propodeum (including propodeal enclosure) covered with dense appressed silvery setae; erect setae silvery-white. Clypeus slightly elongate (Fig. 248), disk flat (Fig. 366). Pronotal collar and scutum smooth, impunctate and covered with appressed setae; scutellum with smooth, longitudinal carina medially. Propodeal enclosure transversely striate. Pronotal collar laterally: Fig. 303. Gonostyle laterally: Fig. 435; penis valve laterally: Fig. 502, ventrally: Fig. 558, apically: Fig. 605. For the genitalia see also Fig. 612 (Jha & Farooqi 1994: 8). Flagellomere I:  $II=1.4-1.6$ ; length of petiole = hindtarsomeres I+II+0.6×III to I+II+III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** India, Pakistan.

***Ammophila striata* MOCSÁRY (Figs 65, 94, 129, 159)**

*Ammophila striata* MOCSÁRY 1878: 200, ♀. Holotype, ♀, Russia: Siberia: no specific locality (TMB), examined.

**M a t e r i a l e x a m i n e d :** Holotype ♀ (TMB).

**R e c o g n i t i o n :** The female of *Ammophila striata* has the gastral apex black without distinct metallic shine, the episternal sulcus extending to the anteroventral margin of the pleuron, the arolia distinctly and the claws without basal tooth. The female of *A. sinensis* differs from *A. striata* in having the mesothoracic venter anteriorly distinctly prominent, with a transverse carina that forms one projection on each side.

**D e s c r i p t i o n :** ♀: 23 mm. Black except tergum I (except basally), gastral segment II and basal half of III red. Clypeus, frons, pronotal lobe, mesopleuron along mesopleural suture and propodeum posterolaterally covered with appressed silvery setae; erect setae on head and foreleg brownish, on remaining areas white. Clypeus slightly elongate, median lobe laterally delimited by small teeth (Fig. 65), disk flat ventrally, distinctly convex and coarsely punctate dorsally (Fig. 94). Pronotal collar transversely ridged and punctate dorsally (Fig. 129), scutum coarsely punctate and transversely ridged, with distinct admedian line; scutellum longitudinally ridged and punctate. Propodeal enclosure irregularly rugose and covered with erect setae medially, coarsely ridged and glabrous laterally. Mesopleuron coarsely punctato-rugose, mesothoracic venter not distinctly prominent anteriorly, but delimited by carina for reception of forecoxa in deep, semicircular concavity. Pronotum laterally: Fig. 159. Flagellomere I: II=2.0; length of petiole = hindtarsomeres I+II.

♂ (Gussakovskij 1930: 204): 19.5 mm. "Male of *A. striata*: gastral apex with black-bluish shine. Following red: tergum I and gastral segment II (both with black dorsal stripe). Clypeus, frons and pronotal lobe covered with appressed silvery setae; erect setae on gena darkened, on remaining areas white. Pronotal collar transversely ridged, scutum distinctly transversely ridged, obliquely rugose-striate and punctate on posterior half. Mesopleuron and mesothoracic venter coriaceous, sparsely punctate, not at all transversely ridged; scutellum longitudinally ridged. Propodeal enclosure irregularly sculptured. Flagellomere I: II=2; petiole as long as tergum I. "Maybe this male does not actually belong to *A. striata*. Further research should be conducted.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Turkey, Russia, Kazakhstan.

***Ammophila striata nadigi* ROTH**

*Ammophila nadigi* ROTH 1932: 82, ♀. Holotype: ♀, Morocco: Ifran (A. Nadig coll.), not examined.

**M a t e r i a l e x a m i n e d :** None.

**R e c o g n i t i o n :** DE BEAUMONT 1960: 5: "Ces individus de la Méditerranée-occidentale se distinguent de ceux de la race typique par leur taille plus grande (27-30 mm) et par la partie antérieure du clypéus de la ♀ plus nettement concave." Further research should be conducted.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Morocco, Spain.

***Ammophila striaticollis* F. MORAWITZ (Fig. 78, 185)**

*Ammophila striaticollis* F. MORAWITZ 1889: 127, ♀. Holotype: ♀, China: Hutoho (ZIN), photograph examined.

**M a t e r i a l e x a m i n e d** : photograph of holotype ♀, (ZIN).

**R e c o g n i t i o n** : The female of *Ammophila striaticollis* has the submarginal cell III petiolate, the propodeal enclosure glabrous and the pronotal collar distinctly transversely striate. Additionally, the gastral apex has no metallic shine, the supra-antennal lamellate projection is absent, the mesothoracic venter not prominent anteriorly and the episternal sulcus extends to the anteroventral margin of the pleuron. The female of *A. striaticollis* differs from *A. campestris* in having the pronotal collar distinctly transversely striate. The female of *A. pubescens* differs from *A. striaticollis* in having the pronotal collar without transverse striae, the petiole with erect setae ventrally and erect setae on the head black.

**D e s c r i p t i o n** : Submarginal cell III petiolate, propodeal enclosure glabrous, gastral apex without metallic shine, supra-antennal lamellate projection absent and mesothoracic venter not prominent anteriorly. Episternal sulcus extending to anteroventral margin of pleuron, arolia well developed, claws without basal tooth.

♀: 15 mm. Black except petiole (always ?), tergum I and gastral segments II and III red. Clypeus, frons, pronotal lobe, broad patch along mesopleural suture, propodeum posterolaterally and mid- and hindcoxa dorsally covered with appressed silvery setae; erect setae white. Median lobe of clypeus slightly rounded apically (Fig. 78). Pronotal collar distinctly, transversely striate (Fig. 185), with deep furrow in hind third. Scutum anteriorly distinctly transversely, posteriorly obliquely striate, median line distinctly; scutellum distinctly, longitudinally carinate. Propodeal enclosure sparsely, obliquely striate and glabrous.

♂ unknown.

**G e o g r a p h i c a l d i s t r i b u t i o n** : China.

***Ammophila strumosa* KOHL (Figs 44, 116, 139, 198, 268, 307, 333, 391, 457, 519)**

*Ammophila quadraticollis* var. *strumosa* KOHL 1906: 355, ♀. Lectotype: ♀, Jordan, no specific locality (NHMW) examined, **present designation**.— As *Ammophila strumosa*: ROTH 1928: 200 (new status).

**M a t e r i a l e x a m i n e d** : 7 ♀ ♀, 1 ♂ (OÖLM), 2 ♀ ♀ (NHMW), 6 ♀ ♀ (coll. Schmid-Egger).

**R e c o g n i t i o n** : *Ammophila strumosa* has the gastral apex with metallic shine, the pronotal collar with a prominent median tubercle (laterally with two slight tubercles, so that, viewed from above, it is bluntly trituberculate), the mesothoracic venter not prominent anteriorly, the episternal sulcus extending to the anteroventral margin of the pleuron. The female of *A. strumosa* differs from *A. exsecta* in having the gastral apex with a metallic shine, the pronotal collar bluntly tritubercular and the metapleuron not covered with appressed silvery setae (*A. exsecta* has a pronotal collar with a concave anterior surface in the lateral view and the thorax evenly covered with appressed silvery setae). The male of *A. horni* differs from *A. strumosa* in having a distinct tooth on the hypostomal carina and in the shape of gonostyle (Fig. 390) and penis valve.

**D e s c r i p t i o n** : Gastral apex with metallic shine, pronotal collar with prominent median tubercle (laterally with two slight tubercles, so viewed from above, bluntly



trituberculate), mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia distinctly, claws without basal tooth. Propodeal enclosure medially irregularly rugose, rugosity becoming regular laterally, covered with white erect setae (except narrow stripe laterally glabrous). Mesopleuron punctato-rugose, mesothoracic venter coarsely transversely rugose and metapleuron punctato-rugose and not covered with appressed silvery setae.

♀: 19-22 mm. Black, with following yellowish-brown: fore- and midlegs (except coxae and trochanters), tegula, basal third of hindtibia, petiole (partly or all), tergum I (basally black), gastral segments II, III and basal half of IV; wings slightly infumate. Clypeus (except ventral half), frons, pronotal lobe, mesopleuron, propodeum posterolaterally covered with appressed silvery setae. Gena, pronotal collar (except dorsal tubercle), scutum and coxae pruinose; erect setae white. Scutum transversely striate and punctate, scutellum longitudinally striate and punctate. Clypeus distinctly elongate (Fig. 44), ventral half shiny, glabrous, sparsely punctate, disk convex. Supra-antennal lamellate projection slightly developed (as in *A. sabulosa* Fig. 20). Pronotal collar dorsally: Fig. 116, laterally: Fig. 139. Flagellomere I: II=1.8-2.0; length of petiole = hindtarsomeres I+II.

♂: 21 mm. Black, with following yellowish-brown: fore- and midlegs (except coxae and trochanters), tegula, basal third of hindtibia, petiole (partly or all), tergum I (basally black), gastral segments II, III and basal half of IV; wings slightly infumate. Clypeus (except ventral half), frons, pronotal lobe, mesopleuron, propodeum posterolaterally covered with appressed silvery setae. Gena, pronotal collar (except dorsal tubercle), scutum and coxae pruinose; erect setae white. Scutum transversely striate and punctate, scutellum longitudinally striate and punctate. Clypeus distinctly elongate (Fig. 198), clypeal disk concave on ventral half, convex on dorsal half (Fig. 333). Pronotal collar laterally: Fig. 268. Genitalia characteristically shaped: gonostyle laterally: Fig. 391, penis valve laterally: Fig. 457, ventrally: Fig. 519. Flagellomere I: II=1.6; length of petiole = hindtarsomeres I+II+0.5×III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Jordan, Israel, Egypt (Sinai Peninsula), Algeria, Morocco, Western Sahara.

***Ammophila tekkensis* GUSSAKOVSKIJ (Figs 53, 109, 120, 144, 234, 285, 322, 419, 481, 539)**

*Ammophila tekkensis* GUSSAKOVSKIJ 1930: 206, ♀, ♂. **Syntypes:** ♀, ♂, Uzbekistan: Khiva (ZIN), photographs examined.

**M a t e r i a l e x a m i n e d :** Kazakhstan: Ryn-peski 20 km E Bisen (2♂♂ OÖLM), 50 km E Zhanaozen 10 km E Senek (2♂♂ OÖLM). Uzbekistan: Ferghana sands 4 km W Yazyavan (1♂ OÖLM), Kagan Polopuscht (1♀ OÖLM).

**R e c o g n i t i o n :** *Ammophila tekkensis* has the gastral apex black without metallic shine or all yellowish-brown and the mesothoracic venter concave anteriorly for reception of the forecoxa, the concavity being margined by a carina that forms one small projection on each side. In addition, the supra-antennal lamellate projection is absent and the episternal sulcus ends at the level of the scrobe. The head (except vertex), the thorax and the propodeum (including propodeal enclosure) are covered with dense appressed silvery setae that obscure most of the underlying sculpture. The female of *A. tekkensis* is similar to *A. gracillima* but differs in having denser appressed silvery setae on the head,

the thorax and the propodeum that obscure the underlying sculpture, the shape of the pronotal collar in lateral view (Fig. 144) and a distinctly convex clypeal disk (Fig. 109) (*A. gracillima* has a clypeal disk nearly flat). The male of *A. tekkensis* is similar to *A. gracillima* but differs in having denser appressed silvery setae on the head, the thorax and the propodeum that obscure the underlying sculpture, additionally, the pronotal collar has a carina anteriorly which is prominent in many specimens (Fig. 285).

Maybe *A. tekkensis* is a variation of *A. gracillima*, further research should be conducted.

**Description:** Gastral apex black, without metallic shine or all yellowish-brown, mesothoracic venter concave anteriorly for reception of forecoxa, concavity margined by carina that forms one small projection on each side. Supra-antennal lamellate projection absent, episternal sulcus ending at level of scrobe, arolia distinctly and claws without basal tooth. Head (except vertex), thorax and propodeum (including propodeal enclosure) covered with dense, appressed, silvery setae that obscure most of underlying sculpture; erect white setae on gena, prothorax and in females on forelegs as long as scape. Wings hyaline.

♀: 16-20 mm. Black, with following yellowish-brown: mandible (except apex), clypeus adjacent to free margin, scape, leg (except coxa), tegula, petiole beneath and nearly all gastral segments. Clypeus slightly elongate (Fig. 53), disk distinctly convex (Fig. 109). Pronotal collar nearly as long as broad (Fig. 120), anterior carina in most specimens slightly prominent (Fig. 144). Pronotal collar and in some specimens scutum slightly transversely striate. Scutellum and metanotum with pair of strong longitudinal ridges and deep medial concavity between them. Flagellomere I: II=2.0; length of the petiole = hindtarsomeres I+II.

♂: 15-18 mm. Black, with following yellowish-brown: mandible (except apex), ventral margin of clypeus, tegula, pronotal lobe, petiole (dorsally darkened), tergum I and gastral segments III-VII (in some specimens VI and VII black); scape nearly all black. Clypeus broadly elongate (Fig. 234), clypeal disk flat. Pronotal collar distinctly elongate (Fig. 322), nearly without transverse rugae, anteriorly with transverse carina in most specimens slightly prominent (Fig. 285). Scutum without distinct transverse rugae, but with deep admedian line; scutellum and propodeal enclosure longitudinally ridged. Gonostyle laterally: Fig. 419; penis valve laterally: Fig. 481, ventrally: Fig. 539. Flagellomere I: II=2.0; length of petiole = hindtarsomeres I+II.

**Geographical distribution:** Iran, Turkmenistan, Kazakhstan, Uzbekistan.

### ***Ammophila terminata* F. SMITH (Figs 73, 168, 290, 409, 486, 544)**

*Ammophila apicalis* BRULLÉ 1839: 92, sex not indicated, junior primary homonym of *Ammophila apicalis* GUÉRIN-MÉNEVILLE 1835. **Holotype or syntypes:** Canary Islands: no specific locality (MNHN?), not examined.

*Ammophila terminata* F. SMITH 1856: 210. Substitute name for *Ammophila apicalis* BRULLÉ 1839.

*Ammophila gegen* TSUNEKI 1971: 171, ♀, ♂. **Holotype:** ♂, Mongolia, Central Gobi: Aymag: Delgerhangay ul (TMB), examined. Synonymized with *Ammophila terminata* by NEMKOV in NEMKOV, KAZENAS, BUDRYS & ANTROPOV 1995: 387, synonymy confirmed.

*Ammophila mocsaryi* FRIVALDSKYI 1876: 352, ♀, ♂. **Syntypes:** Hungary: Budapest and Temes Komitat (now: Romania: Dimis District): Grebenács (TMB). Synonymized with *Ammophila apicalis* by KOHL 1906: 331. Syntype ♀ (NHMW) examined, synonymy confirmed.

*Ammophila rhaetica* KOHL 1879: 400, ♀. Lectotype: ♀, Austria: St. Justina and Vierglberg near Bozen, now Italy: Alto Adige: near Bolzano (NHMW), examined, **present designation**. Synonymized with *Ammophila mocsaryi* by KOHL 1880: 183, synonymy confirmed.

*Ammophila julii* FABRE 1879: 322, ♀. Syntypes: France: no specific locality (MNHN), not examined. Synonymized with *Ammophila apicalis* by DALLA TORRE 1897: 404.

*Ammophila kirgisica* F. MORAWITZ 1891: 203, ♀, ♂. Syntypes: ♀, ♂, European Kazakhstan: Ryn-Peski, Kirgizskaya (ZIN), photographs examined. Synonymized with *Ammophila apicalis* by KOHL 1906: 332. Syntype: ♀ (NHMW), examined, synonymy confirmed.

*Ammophila terminata turanica* KAZENAS 2000: 18, ♀, ♂. Holotype: ♀, Kazakhstan: near Ayak-Kalkan in Ili River valley 35 km NE Chilik (ZIN), not examined.

**Material examined**: 77 ♀♀, 93 ♂♂ (OÖLM), 24 ♀♀, 27 ♂♂ (NHMW), 7 ♂♂ (BMNH).

**Recognition**: *Ammophila terminata* has the gastral apex black with metallic shine, the propodeal enclosure glabrous, the episternal sulcus extending to the anteroventral margin of the pleuron and the supra-antennal lamellate projection absent. Additionally, the pronotal collar and the scutum are more or less finely transversely striate, the scutellum is longitudinally striate and the mesothoracic venter is not prominent anteriorly. The female of *A. sabulosa* differs from *A. terminata* in having a propodeum enclosure all covered with erect setae and the pronotal collar smooth, without any transverse striae. Both sexes of *A. electa* are similar to *A. terminata* but differ in having a well developed supra-antennal lamellate projection. The female of *A. striata* differs from *A. terminata* in having the gastral apex without metallic shine and the mesothoracic venter anteriorly slightly prominent, with a transverse carina. The female of *A. gussakovskii* is similar to *A. terminata* but differs in having the pronotal collar coarsely, transversely striate and the free margin of the clypeus with a small emargination medially (Fig. 72). The female of *A. tsunekii* is similar to *A. terminata* but differs in having distinctly appressed silvery setae that obscure the underlying sculpture on the head (except vertex), the thorax (except metapleuron) and the propodeum (except propodeal enclosure), in some specimens the silvery setae may be destroyed on the dorsal surface of the pronotal collar and the scutum. The male of *A. terminata* differs from *A. sabulosa* in having a glabrous propodeal enclosure, distinctly developed appressed silvery setae on the mesopleuron and in the shape of the penis valve in lateral view (Fig. 486). The male of *A. gussakovskii* is similar to *A. terminata* but differs in having the pronotal collar and the scutum shiny and distinctly transversely striate. The male of *A. tsunekii* is similar to *A. terminata* but differs in having the head (except vertex), the thorax (except metapleuron) and the propodeum (except propodeal enclosure) covered with dense appressed silvery setae that obscure most of the underlying sculpture.

In some specimens the striae on pronotal collar are reduced, therefore *A. terminata* is included twice in the key.

**Description**: Gaster apex black, with metallic shine, propodeal enclosure glabrous, episternal sulcus extending to anteroventral margin of pleuron, supra-antennal lamellate projection absent, pronotal collar and scutum more or less finely transversely striate and scutellum longitudinally striate. Mesothoracic venter not prominent anteriorly, arolia distinctly and claws without basal tooth.

♀: 14-18 mm. Black except tergum I and gastral segments II-IV red (in some specimens partly bluish-black); in some specimens from Kazakhstan and Canary Islands petiole partly or all red. Clypeus, frons, pronotal lobe, mesopleuron, propodeum laterally and

posterolaterally and mid- and hindcoxa covered with appressed silvery setae (setae reduced on frons in many specimens). Metanotum and propodeal enclosure without appressed setae; erect setae brownish-white. Clypeus slightly elongate (Fig. 73), disk slightly convex. Frons and vertex dull, nearly impunctate. Pronotal collar and scutum in most specimens dull, finely transversely striate. Propodeal enclosure obliquely finely striate, shiny, but in some specimens micropunctate and dull. Mesopleuron, metapleuron and propodeum laterally in most specimens obliquely, finely striate and dull. Pronotal collar laterally: Fig. 168. Flagellomere I: II=1.6-1.8; length of petiole = hindtarsomeres I+0.6×II to I+0.75×II.

♂: 13-18 mm. Black except tergum I and gastral segments II-III red (in some specimens terga I and III black, in others petiole red). Clypeus, frons, pronotal lobe, mesopleuron, propodeum posterolaterally and mid- and hindcoxa covered with appressed silvery setae; metapleuron glabrous, erect setae white. Mesopleuron and mesothoracic venter dull, finely, transversely striate. Pronotal collar laterally: Fig. 290; gonostyle laterally: Fig. 409; penis valve laterally: Fig. 486, ventrally: Fig. 544. Flagellomere I: II=1.3-1.6; length of petiole = hindtarsomeres I+II to I+II+0.5×III.

**Geographical distribution:** West, central and southern Europe, Canary Islands, Tunisia, Algeria, Turkey, Kazakhstan, Kyrgyzstan, Mongolia, China.

#### ***Ammophila terminata turkestana* KOHL**

*Ammophila apicalis* var. *turkestana* KOHL 1906: 333, sex not indicated. Holotype or syntypes: Turkestan (deposity unknown, not in NHMW).

**Material examined:** China: Boro Horo Shan Jining Ining H-Sien 44°06'N 81°56'E (2♂♂ OÖLM), Kazakhstan: 10 Km E Djambul (1♀ OÖLM).

**Recognition:** *Ammophila terminata turkestana* differs from *Ammophila terminata terminata* only in having the mesopleuron without appressed silvery setae and the bodylength 19-22 mm.

Maybe this subspecies is only an individual variation.

**Geographical distribution:** China, Kazakhstan.

#### ***Ammophila theryi* (GRIBODO) (Fig. 84, 106, 137, 191)**

*Coloptera theryi* GRIBODO 1894: 3, ♀, ♂. Lectotype: ♂, Algeria: Biskra (Genova), examined, **present designation, resurrected status.**

*Ammophila judaeorum* KOHL 1901: 149, ♀, ♂. Lectotype: ♀, Palestine: Jericho (NHMW), examined, **present designation, new synonym.**

*Ammophila barbara* var. *airensis* BERLAND 1950: 296, ♀. Holotype: ♀, Niger: Air: Agadez (MNHN), examined, **new synonym.**

**Material examined:** 37♀♀, 9♂♂ (OÖLM), 4♀♀, 1♂ (NHMW), 4♀♀ (coll. Schmid-Egger).

**Recognition:** *Ammophila theryi* has the forewing with two submarginal cells and the gastral apex without metallic shine, the episternal sulcus ending at the level of the scrobe and the supra-antennal lamellate projection absent. In addition, the mesothoracic venter is concave anteriorly for reception of the forecoxa, the concavity is margined by a carina that in most specimens forms one small projection on each side. The pronotal collar and the scutum are distinctly transversely ridged and the propodeal enclosure is irregularly rugose and covered with fine, appressed, silvery setae along the midline,

transversely rugose and glabrous laterally. Both sexes of *A. theryi* differ from *A. barbara* in having partly reddish legs, the mesothoracic venter concave anteriorly for reception of the forecoxa, the concavity is margined by a carina that in most specimens forms one small projection on each side, the posterior face of the forecoxa armed with a small spine (difficult to see) and the lateral part of the propodeal enclosure glabrous (*A. barbara* has black legs, the mesothoracic venter not prominent anteriorly and a propodeal enclosure all covered with setae). The Sub-saharan species *A. saussurei* differs from *A. theryi* in having the mesopleuron distinctly punctate (punctures 0-1 diameter apart) and more reddish collar on the thorax (*A. theryi* has the mesopleuron irregularly rugose).

**D e s c r i p t i o n :** Forewing with two submarginal cells, gastral apex without metallic shine, episternal sulcus ending at level of scrobe, supra-antennal lamellate projection absent, arolia distinct, claws without basal tooth. Mesothoracic venter concave anteriorly for reception of forecoxa, concavity margined by carina that in most specimens forms one projection on each side. Pronotal collar and scutum distinctly transversely ridged, propodeal enclosure irregularly rugose, covered with fine appressed silvery setae along midline, transversely rugose and glabrous laterally.

♀: (13)15-18 mm. Black, with following variably yellowish-brown: mandible (except apex), clypeus along free margin, scape (in most specimens), tegula, pronotal lobe, fore- and midlegs (except coxae, trochanters and tarsi), hindleg (partly), petiole, tergum I and gastral segments II-IV (IV dorsally black). Clypeus and frons covered with dense, appressed, silvery setae, remaining areas of head (except vertex), thorax and propodeum laterally covered with fine, sparse, appressed silvery setae. Clypeus slightly elongate (Fig. 84), disk convex (Fig. 106), posterior surface of forecoxa with small spine (difficult to see) and mesopleuron coarsely obliquely punctato-rugose. Pronotal collar dorsally: Fig. 137, laterally: Fig. 191. Flagellomere I: II= 1.7-1.8; length of the petiole = hindtarsomeres I+0.6×II to I+0.75×II.

♂: 12-16 mm. Black, with following yellowish-brown: mandible (except apex; in some specimens all black), tegula, fore- and midlegs (partly), hindleg (partly or all black), petiole, tergum I and gastral segments II-IV (in some specimens dorsally black). Clypeus and frons covered with dense, appressed, silvery setae, remaining areas of head (except vertex), thorax and propodeum laterally sparsely covered with appressed setae. Flagellomere I: II=1.6-1.8; length of the petiole = hindtarsomeres I+II to I+II+0.5×III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Jordan, Syria, Israel, Egypt (Sinai Peninsula), Iran, Algeria, Morocco.

***Ammophila touareg* Ed. ANDRÉ (Figs 254, 259, 371, 441, 508)**

*Ammophila touareg* Ed. ANDRÉ 1886: 65, ♀, ♂. **Syntypes:** Algeria: Sebden in Oran Province (MNHN), not examined, **resurrected status.** Treated as a subspecies of *A. sabulosa* by ROTH 1928: 193 and subsequent authors, and as a variety of *A. sabulosa* by NADIG 1933: 100.

**M a t e r i a l e x a m i n e d :** Algeria: Bouira (1♂ OÖLM). Morocco: Ifrane env. (5♂♂ OÖLM).

**R e c o g n i t i o n :** *Ammophila touareg* has the gastral apex bluish-black with metallic shine, the supra-antennal lamellate projection well developed, the episternal sulcus extending to the anteroventral margin of the pleuron and the mesothoracic venter not prominent anteriorly. The male of *A. touareg* is similar to *A. sabulosa* but differs in having the supra-antennal lamellate projection distinctly developed and terga II and III

without a dorsal black stripe (*A. sabulosa* has the supra-antennal lamellate projection slightly developed (Fig. 20) and the terga II and III with a dorsal black stripe).

**Description:** Gastral apex bluish-black, with metallic shine, supra-antennal lamellate projection well developed, episternal sulcus extending to anteroventral margin of pleuron, mesothoracic venter not prominent anteriorly, arolia well developed and claws without basal tooth.

♀ (ANDRÉ 1886: 64): 18-24 mm. Black except mandible (except apex), tergum I (except basally) and gastral segments II and III red. Clypeus, frons, pronotal lobe, mesopleuron, propodeum posterolaterally and coxa covered with appressed silvery setae; erect setae white. Pronotal collar sparsely punctate, scutum coarsely punctate, punctures transversely confluent and forming short transverse rugae. Scutellum and metanotum longitudinally striate.

♂: 18-24 mm. Black except tergum I (except basally), gastral segments II and III (except apically) red. Clypeus, frons, pronotal lobe, mesopleuron, propodeum posterolaterally and coxae covered with appressed silvery setae; erect setae pale. Clypeus elongate, free margin nearly truncate (Fig. 254), clypeal disk flat (Fig. 371). Pronotal collar coarsely punctate (punctures 0-1 diameter apart). Scutum densely, coarsely punctate anteriorly, punctures transversely confluent, obliquely ridged posteriorly, admedian line distinctly; scutellum and metanotum longitudinally ridged and punctate. Mesopleuron and metapleuron coarsely punctate (punctures 0-2 diameters apart). Pronotal collar laterally: Fig. 259. Gonostyle laterally: Fig. 441; penis valve laterally: Fig. 508. Flagellomere I: II=1.2-1.4; length of petiole = hindtarsomeres I+II.

**Geographical distribution:** Algeria, Morocco.

***Ammophila tsunekii* MENKE (Figs 76, 171, 412, 489, 547)**

*Ammophila tomentosa* TSUNEKI 1971: 174, ♀, junior secondary homonym of *Ammophila tomentosa* (ARNOLD 1920). **Holotype:** ♀, Mongolia: Central Gobi Aymag: Hoot bulag (TMB), examined.

*Ammophila tsunekii* MENKE in BOHART & MENKE 1976: 154. Substitute name for *Ammophila tomentosa* TSUNEKI.

**Material examined:** 18♀, 41♂♂ (OÖLM).

**Recognition:** *Ammophila tsunekii* has the gastral apex bluish-black with metallic shine, the propodeal enclosure glabrous and the mesothoracic venter not prominent anteriorly. In addition, the following are covered with appressed silvery setae that obscure the underlying sculpture: the head (except a small spot on the free margin of the clypeus and the vertex), the thorax (except the metapleuron) and the propodeum (except dorsal enclosure). In most collection specimens the appressed setae are damaged on the dorsal face of the pronotal collar, the scutum and the scutellum; remarkable is the sharp limit to the glabrous parts. Both sexes of *A. tsunekii* are similar to *A. terminata* but differ in having much denser appressed, silvery setae on the head, the thorax and the propodeum.

**Description:** Gastral apex bluish-black, with metallic shine, propodeal enclosure glabrous, mesothoracic venter not prominent anteriorly, episternal sulcus extending to anteroventral margin of pleuron, arolia distinctly developed and claws without basal tooth. Following covered with appressed, silvery setae that obscure underlying sculpture: head (except small spot on free margin of clypeus and vertex), thorax (except



metapleuron) and propodeum (except dorsal enclosure). In most collection specimens appressed setae damaged on dorsal face of pronotal collar, scutum and scutellum; remarkably sharp limit to glabrous parts. Pronotal collar shiny, smooth, without distinct transverse striae (at most transversely microstriate); scutum also shiny, with deep admedian line and with fine short striae laterally; scutellum longitudinally striate. Propodeal enclosure obliquely striate and in some specimens micropunctate between the striae.

♀: 13-17 mm. Black except tergum I and gastral segments II-IV red. Clypeus slightly elongate, free margin truncate (Fig. 76), disk slightly convex. Pronotal collar laterally: Fig. 171. Flagellomere I: II=1.6 -1.9; length of petiole = hindtarsomeres I+0.6×II to I+0.75×II.

♂: 14.5-17 mm. Black except tergum I and gastral segments II-IV red. Gonostyle laterally: Fig. 412; penis valve laterally: Fig. 489, ventrally: Fig. 547. Flagellomere I: II=1.5-1.6; length of petiole = hindtarsomeres I+II to I+II+0.3×III.

**G e o g r a p h i c a l d i s t r i b u t i o n :** Mongolia.

***Ammophila untumoris* YANG & LI (Figs 747-752)**

*Ammophila untumoris* YANG & LI 1989: 108, ♀. Holotype: ♀, China: Shaanxi Province: Ganquan County: Qingquan (Beijing Agricultural University), not examined.

**M a t e r i a l e x a m i n e d :** None.

**D e s c r i p t i o n :** (YANG & LI 1989: 108, translated from Chinese by Yan Chengjin): ♀: "Body length 19.0 mm. Black, tergum I largely, terga II-III and sterna II-III yellowish red; gastral apex black without metallic blue luster; head and thorax with long, white, erect setae; pronotal lobe, mesopleuron, metapleuron posteriorly and propodeum posterolaterally with dense appressed setae; clypeus, and lower frons with sparsely, appressed setae; lateral and ventral sides of thorax and coxae covered with dense pubescence. Vertex, frons and clypeus sparsely punctate, without supra-antennal projection. Free margin of clypeus with two lateral teeth. Postocellar diameter (ODD): postocellar distance (POD): oculocellar distance (OOD): interocular distance at anterior ocellus (IODP): interocular distance at clypeus (IODC) = 1: 26: 3.7: 11: 10.4. Relative length of pedicel: flagellomeres I: II: III: VIII = 1.8: 5.8: 3: 3: 3.2. Pronotal collar: length: width = 5: 9.5, coarsely, transversely striate, with insignificant median furrow. Scutum coarsely, transversely rugose-striate and punctate, without admedian line; scutellum coarsely, longitudinally striate; metanotum without distinct striae; propodeal enclosure with inconspicuous median carina, surface coarsely, obliquely striate laterally. Mesopleuron and mesosternum sparsely punctate, with episternal sulcus, front part of mesosternum with a large, deep semicircular concavity; metapleuron slightly rugose-striate; lateral side of propodeum coarsely rugose-striate. Submarginal cell III not petiolate. Foretarsus asymmetrical; hindleg relative length of tibia: tarsi I: II = 25: 13: 7.5, claws simple, arolia present. Length of gastral petiole: tergum I = 19: 19.

♂ unknown.

**R e l a t i o n s h i p s :** This new species is related to *A. occipitalis* MORAWITZ (1890), but differs in legs and clypeus, absence of tumor behind hindocellus and a shorter pronotum and petiole."

**G e o g r a p h i c a l d i s t r i b u t i o n :** China (Shaanxi Province).

***Ammophila vagabunda* F. SMITH (Figs 35, 108, 194, 249, 304, 367, 436, 503, 559)**

*Ammophila vagabunda* F. SMITH 1856: 218, ♀. Syntype: ♀, North China (BMNH), examined, **resurrected status**.

*Ammophila solowiyofkae* MATSUMURA 1911: 111, ♀. Syntypes Russia: Skhalin: SOLOWIEVKA & GALKINOWRASKOYE, now DOLINSK (depository ?), **new synonym**.

*Ammophila sabulosa nipponica* TSUNEKI 1967: 23, ♀, ♂. Holotype: ♀, Japan: Fukui Prefecture: Ohno (K. Tsuneki coll.), not examined. Synonymized with *Ammophila sabulosa solowiyofkae* by NEMKOV 2005: 141.

**Material examined**: 19♀♀, 22♂♂ (OÖLM), 10♀♀, 11♂♂ (BMNH).

**Recognition**: *Ammophila vagabunda* has the gastral apex with bluish-black metallic shine, the supra-antennal lamellate projection high, the mesothoracic venter not prominent anteriorly and the episternal sulcus extending to the anteroventral margin of the pleuron. In addition, the propodeal enclosure is broadly irregularly rugose along the midline and covered with erect setae, transversely ridged and glabrous laterally. The scutum is dull and punctate, punctures confluent laterally. The mesopleuron, the metapleuron and the propodeum laterally are punctato-rugose. Both sexes of *A. infesta* are similar to *A. vagabunda* but differ in having the scutum and the mesopleuron smooth, finely and more or less regularly punctate, punctures well defined and not confluent (punctures more than one diameter apart). The female of *A. formosensis* differs from *A. vagabunda* in having the clypeus, the frons, and the mesopleuron covered with appressed silvery setae and the propodeum enclosure all covered with erect setae (*A. vagabunda* has the clypeus and the frons not covered with appressed silvery setae and the propodeal enclosure laterally glabrous). The female of *A. sabulosa* differs from *A. vagabunda* in having the supra-antennal lamellate projection less developed, less than the diameter of midocellus (Fig. 20) and a propodeal enclosure all covered with erect setae. The female of *A. sickmanni* is similar to *A. vagabunda* but differs in having the scutum distinctly transversely ridged and punctate. The male of *A. vagabunda* differs from *A. sabulosa* in having a distinct supra-antennal lamellate projection and in the shape of the penis valve (Fig. 503).

**Description**: Gastral apex with bluish-black metallic shine, supra-antennal lamellate projection distinctly, mesothoracic venter not prominent anteriorly and episternal sulcus extending to the anteroventral margin of pleuron. Propodeal enclosure broadly, irregularly rugose along the midline, covered with erect setae and transversely ridged and glabrous laterally. Mesopleuron, metapleuron and propodeum laterally punctato-rugose, arolia well developed, claws without basal tooth. Wings brownish fumate.

♀: 20-24 mm. Black except tergum I (except dorsally) and gastral segment II red. Pronotal lobe posteriorly, propodeum posterolaterally and in some specimens small spot on mesopleuron covered with appressed silvery setae. Erect setae on head and prothorax black, on remaining areas white. Clypeus slightly elongate and median lobe with lateral tooth (Fig. 35), disk distinctly convex (Fig. 108). Frons between eyes deeply impressed. Pronotal collar dorsally sparsely punctate, anterior and lateral surface transversely striate. Scutum dull, punctate, punctures laterally confluent and admedian line well developed. Scutellum and metanotum longitudinally striate and punctate. Pronotal collar laterally: Fig. 194. Flagellomere I: II=1.6-2.0; length of petiole = hindtarsomeres I+0.3×II to I+0.6×II.

♂: 16-19 mm. Black except tergum I and gastral segment II red (both with dorsal black

stripe). Clypeus, frons, pronotal lobe, propodeum posterolaterally and in some specimens small stripe on mesopleuron covered with appressed silvery setae; erect setae on head brown, on remaining areas white. Clypeus elongate, more or less emarginate medially (fig. 249), disk flat (Fig. 367). Frons and vertex punctate, pronotal collar sparsely punctate, transversely striate laterally. Scutum dull, punctate, punctures transversely confluent, scutellum and metanotum longitudinally ridged and punctate. Gonostyle laterally: Fig. 436; penis valve characteristically shaped: Figs 503, 559. Flagellomere I: II=1.4-1.6; length of petiole = hindtarsomeres I+II.

**Geographical distribution:** Japan, Korea, China, Mongolia, India, Russian Far East (Vladivostok).

### ***Ammophila vetuberosa* LI & YANG (Figs 753-763)**

*Ammophila vetuberosa* LI & YANG in LI, LI & YANG 1994: 290, ♂. **Holotype:** ♂, China: Shandong Province: Dongying City: Xianthe Town (Shandong Agricultural University), not examined.

**Material examined:** Mongolia: Ordos (1♂ NHMW).

**Recognition:** The male of *A. vetuberosa* has the submarginal cell III petiolate, the gastral apex without metallic shine, the propodeal enclosure glabrous, the supra-antennal lamellate projection absent and the mesothoracic venter not prominent anteriorly. Additionally, the episternal sulcus extends to the anteroventral margin of the pleuron, the arolia are well developed and the claws have no basal tooth. The posterior surface of the forecoxa has a tooth (angulation). The male of *A. vetuberosa* differs from all species with a petiolate submarginal cell III in having a tooth on the posterior surface of the forecoxa.

**Description:** ♂: 12-17 mm. Black except petiole (basally more or less black), tergum I and gastral segments II and III red. Clypeus, frons, pronotal lobe, patch on mesopleuron and propodeum posterolaterally covered with dense appressed silvery setae, remaining areas of head and thorax distinctly pruinose. Clypeus elongate (Fig. 753), disk flat. Pronotal collar dorsally impunctate, in lateral view see Fig. 759, scutum dull, sparsely punctate and transversely microstriate; scutellum longitudinally striate and punctate. Mesopleuron dull and punctate, metapleuron and propodeum laterally punctatose. Propodeal enclosure obliquely striate. Genitalia: Figs 760-763. Flagellomere I: II=2.4.

♀ unknown.

**Geographical distribution:** China, Mongolia.

### ***Ammophila xinjiangana* LI & YANG (Figs 764-769)**

*Ammophila xinjiangana* LI & YANG 1989: 34, ♀. **Holotype:** ♀, China: Xinjiang Province: Urumqui (Beijing Agricultural University), not examined.

**Material examined:** None.

**Description** (LI & YANG 1989: 34, translated from Chinese by Yan Chengjin): "♀: Body length 19.9 mm. Black; tergum I largely, terga II-III, sterna II-III, tergum IV basally and sternum IV basally yellowish red; gastral apex with metallic blue luster; posterior part of tegula and wings yellowish brown, veins pale brown. Clypeus with long, pale brown setae; vertex, gena and thorax with long white setae; clypeus, lower

frons, metanotum posterolaterally and coxae covered with dense pubescence; pronotal lobe, mesopleuron posteriorly and propodeum posterolaterally with dense appressed setae. Vertex sparsely punctate, without supra-antennal projection, free margin with two lateral teeth. Postocellar diameter (ODD): postocellar distance (POD): oculocellar distance (OOD): interocular distance at midocellus (IODP): interocular distance at clypeus (IODC) = 1: 2: 3.1: 9.6: 10. Relative length of antennal pedicel: flagellomeres I: II: III: VIII = 1.5: 6.4: 4: 4: 2.1. Pronotal collar: length: width = 4: 10, sparsely punctate, with median furrow. Scutum sparsely punctate, with inconspicuous admedian line; scutellum coarsely, longitudinally striate; metanotum without distinct striae. Propodeal enclosure with inconspicuous median carina, surface coarsely obliquely striate laterally; mesopleuron densely punctate, with episternal sulcus; mesosternum sparsely punctate; front part of mesosternum of usual shape. Metapleuron dorsally slightly longitudinally striate, metapleuron ventrally and lateral side of propodeum coarsely rugose-striate. Forewing with three submarginal cells. Foretarsus asymmetrical; hindleg relative length of tibia: tarsi I: II: III = 25: 13.5: 7.8: 6, claws simple, arolia present. Length of gastral petiole: tergite I: II: III = 18: 17: 13: 9.8.

♂ unknown.

**Relationships:** This species is related to *A. sabulosa* L. (1758), *A. sabulosa infesta* SMITH (1873), *A. terminata* SMITH (1856) and *A. terminata mocsaryi* FRIVALDSKY (1876) but differs by the combination of the absent supra-antennal projection, the color of the gaster and the sculpture of the collar, scutum and propodeal enclosure".

**Geographical distribution:** China (Xinjiang).

***Ammophila zimmermannae* DOLLFUSS nov.sp. (Figs 15, 22, 195, 255, 260, 372, 442, 504, 607)**

**Records:** Holotype: ♂, Kazakhstan mer., Darbaza, 40 km N Tachkent, 3. V.1994, leg. Ma. Halada (OÖLM). Paratype: Tajikistan, Ramit reserv., 18. VIII.1958, leg. V. Gurko (1 ♀ OÖLM).

**Name derivation:** In honor of Mag. Dominique Zimmermann, curator of Hymenoptera of the Vienna Museum of Natural History, Austria.

**Recognition:** *Ammophila zimmermannae* is characterized by partly red legs, the gastral apex with no metallic shine, the supra-antennal lamellate projection absent and the pronotal collar and the scutum punctate, without transverse striae. In addition, the episternal sulcus extends to the anteroventral margin of the pleuron, the mesothoracic venter is not prominent anteriorly and the propodeal enclosure is all covered with erect setae. The male of *A. laevigata* is similar to *A. zimmermannae* but differs in having the propodeal enclosure reticulate and covered with erect setae along the midline and transversely ridged and glabrous laterally and in the shape of penis valve in lateral view (Fig. 447). Both sexes of *A. heydeni* differ from *A. zimmermannae* in having a transversely ridged scutum. The female of *A. laevigata* is similar to *A. zimmermannae* but differs in having the propodeal enclosure coarsely reticulate and covered with erect setae along the midline, coarsely transversely rugose and glabrous laterally, and a nearly flat clypeus.

**Description:** Gastral apex without metallic shine, supra-antennal lamellate projection absent, pronotal collar and scutum punctate, without transverse striae.

Episternal sulcus extending to anteroventral margin of pleuron, mesothoracic venter not prominent anteriorly, propodeal enclosure all covered with erect setae.

♂: 19 mm. Black, with following red: tegula, fore- and midlegs (except coxae and trochanters), terga I and II (both with black stripe dorsally), tergum III and sterna II and III. Wings hyaline. Clypeus, frons, pronotal lobe, patch on mesopleuron, propodeum anterolaterally and posterolaterally covered with appressed silvery setae; coxae pruinose, erect setae white. Clypeus slightly elongate, medially emarginate (Fig. 255), clypeal disk flat (Fig. 372). Frons punctate, vertex sparsely punctate. Pronotal collar finely punctate (punctures 0-2 diameters apart), scutum coarsely punctate (punctures 0-2 diameters apart), scutellum longitudinally ridged and punctate. Propodeal enclosure coarsely reticulate, all covered with erect setae, propodeum laterally punctate (punctures 0-1 diameters apart); mesopleuron punctate like scutum, metapleuron densely punctate, arolia distinct, claws without basal tooth. Pronotal collar laterally: Fig. 260. Gonostyle laterally: Fig. 442; penis valve laterally: Fig. 504, apically: Fig. 607. Flagellomer I: II=1.6; length of petiole = hindtarsomeres I+II.

♀: 20 mm. Black, with following red: tegula, forelegs (except coxa), midlegs (except coxa and trochanter), hindtibia basally, tergum I (except dorsally), gastral segments II, III all and IV basally; mandible (except apex) and clypeus near free margin dark reddish-brown. Clypeus, frons, pronotal lobe, mesopleuron, propodeum anterolaterally and posterolaterally and hindcoxa dorsally covered with appressed silvery setae; erect setae white. Clypeus slightly elongate (Fig. 22), disk convex (Fig. 15), sparsely punctate. Frons dull and punctate, vertex dull, nearly impunctate. Pronotal collar dorsally shiny and punctate, laterally (Fig. 195), scutum shiny, densely punctate (punctures 0-1 diameter apart), admedian line distinct. Scutellum shiny, longitudinally striate and punctate, metanotum punctate, mesopleuron densely punctate, metapleuron and propodeum laterally punctato-rugose. Propodeal enclosure coarsely reticulate, all covered with erect setae and pruinosity. Flagellomere I: II=1.6; length of petiole = hindtarsomeres I+II.

**G e o g r a p h i c a l   d i s t r i b u t i o n :** Kazakstan, Tajikistan

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## Zusammenfassung

Ein Schlüssel für die paläarktischen und indischen Arten der Gattung *Ammophila* KIRBY 1798 wird erstellt, der 87 Arten beinhaltet.

Die folgenden 12 neuen Arten werden beschrieben: *A. abnormis* (Pakistan), *A. antropovi* (Tunisia), *A. beaumonti* (Mongolia), *A. gusenleitneri* (Algeria, Tunisia, Morocco), *A. haladai* (Turkey), *A. menkei* (Tunisia), *A. ohli* (Uzbekistan), *A. pakistana* (Pakistan), *A. persica* (Iran), *A. rauschi* (Kazakhstan, Kyrgyzstan), *A. schmideggeri* (Israel) and *A. zimmermannae* (Kazakhstan, Tajikistan).

Für die folgenden Arten werden die bisher unbekanntenen Männchen beschrieben: *A. adelpha* KOHL 1901, *A. afghanica* BALTHASAR 1957, *A. mitlaensis* ALFIERI 1961 und *A. sinensis* SICKMANN 1894.

Die folgenden Taxa, bisher als Varietäten oder Unterarten beschrieben, bekommen Artstatus: *Ammophila atlantica* ROTH 1928, *Ammophila electa* KOHL 1901, *Ammophila nigrina* F. MORAWITZ 1889, *Ammophila vagabunda* F. SMITH, *Ammophila striaticollis* F. MORAWITZ 1889, *Coloptera theryi* GRIBODO 1894 und *Ammophila touareg* Ed. ANDRÉ.

Die folgenden Arten sind neue Synonyme in *Ammophila* (der gültige Name steht jeweils zuletzt): *A. atripes* F. SMITH 1852, *A. basalis* F. SMITH 1856, *A. dimidiata* F. SMITH = *A. clavus* (FABRICIUS 1775); *A. dantoni* ROTH in NADIG 1933 ♂ only = *A. erminea* KOHL 1901; *A. philomela* NURSE 1903 = *A. gracillima* TASCHENBERG 1896; *A. ruficollis* F. MORAWITZ 1890 = *A. occipitalis* F. MORAWITZ 1890; *A. arnaudi* TSUNEKI 1967 = *A. pubescens* CURTIS 1836; *A. dantoni* ROTH in NADIG 1933 ♀ only = *A. rubripes* SPINOLA 1839; *A. subassimilis* STRAND 1913, *A. sjoestedti* GUSSAKOVSKIJ 1934 = *A. sickmanni* KOHL 1901; *A. planicollaris* LI & YANG 1990 = *A. sinensis* SICKMANN 1894; *A. solowijofkae* MATSUMURA 1911 = *A. vagabunda* F. SMITH 1856; *A. judaeorum* KOHL 1901, *A. barbara* var. *airensis* BERLAND 1950 = *A. theryi* (GRIBODO 1894).

20 Lectotypen werden designiert.

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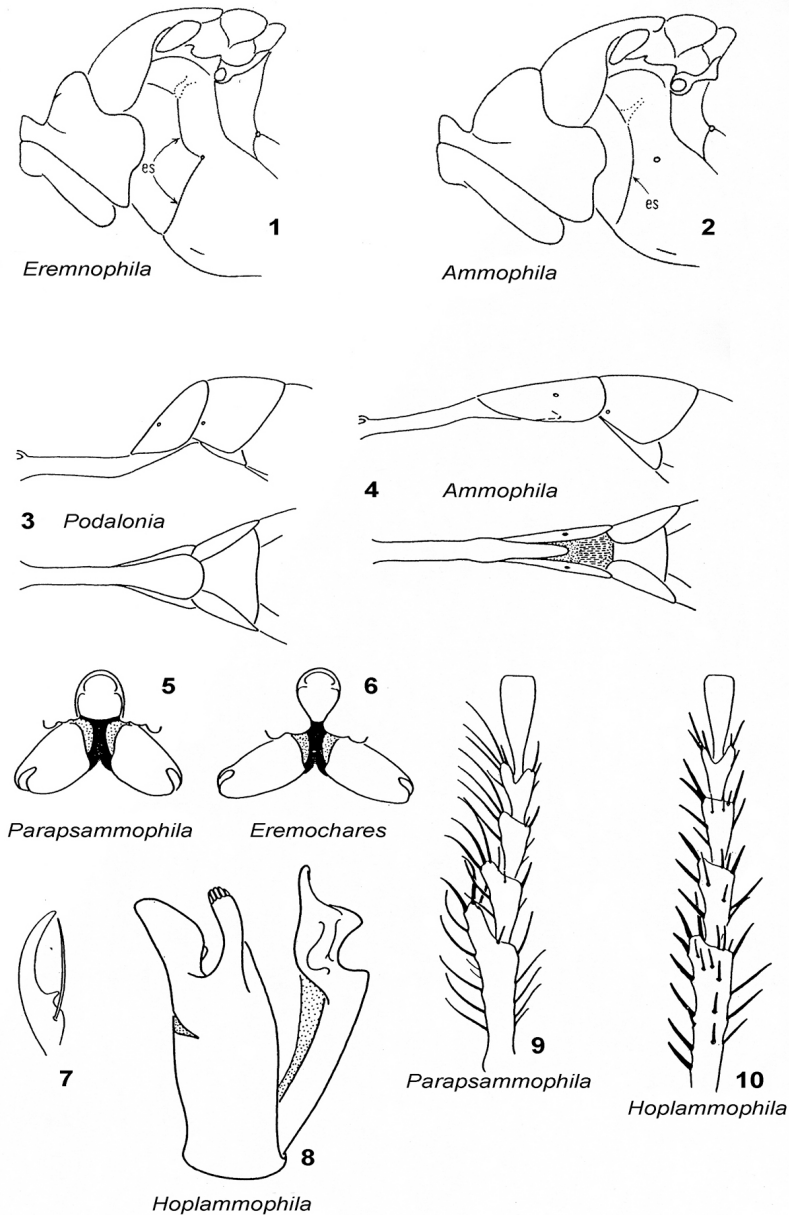
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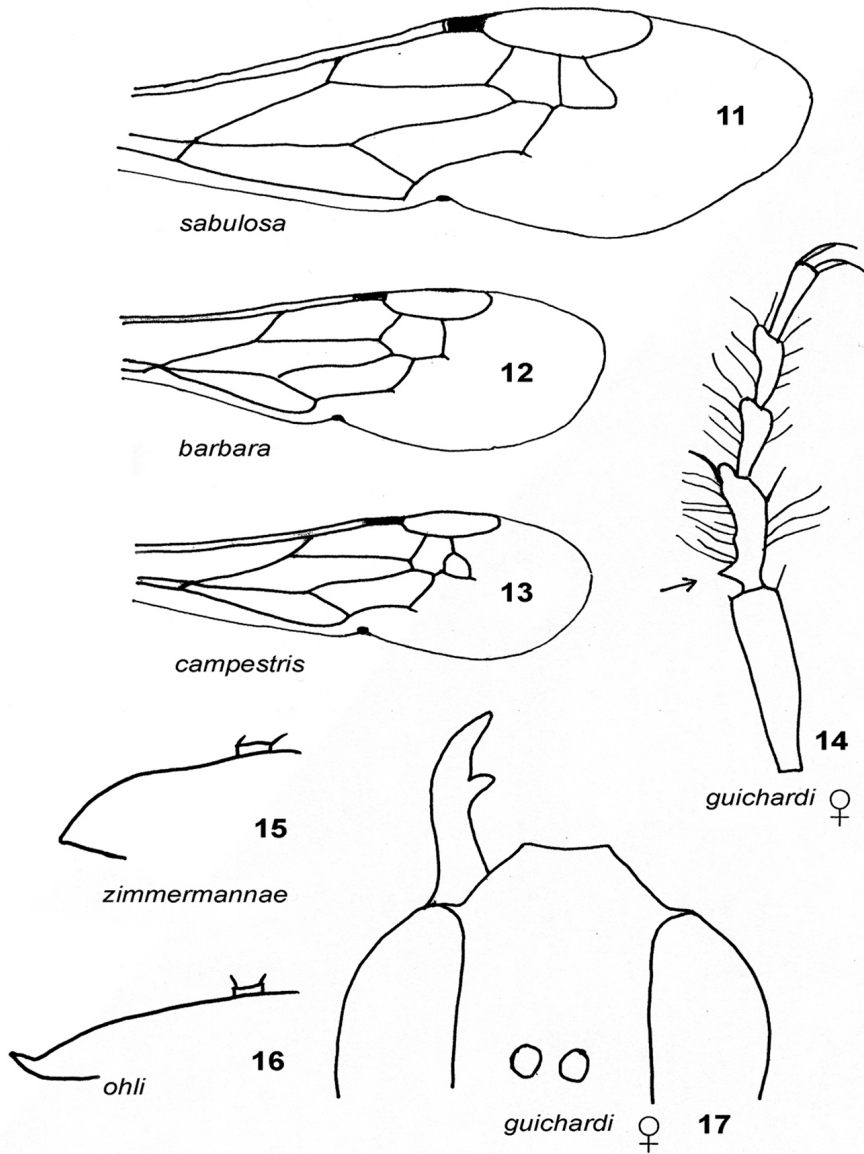
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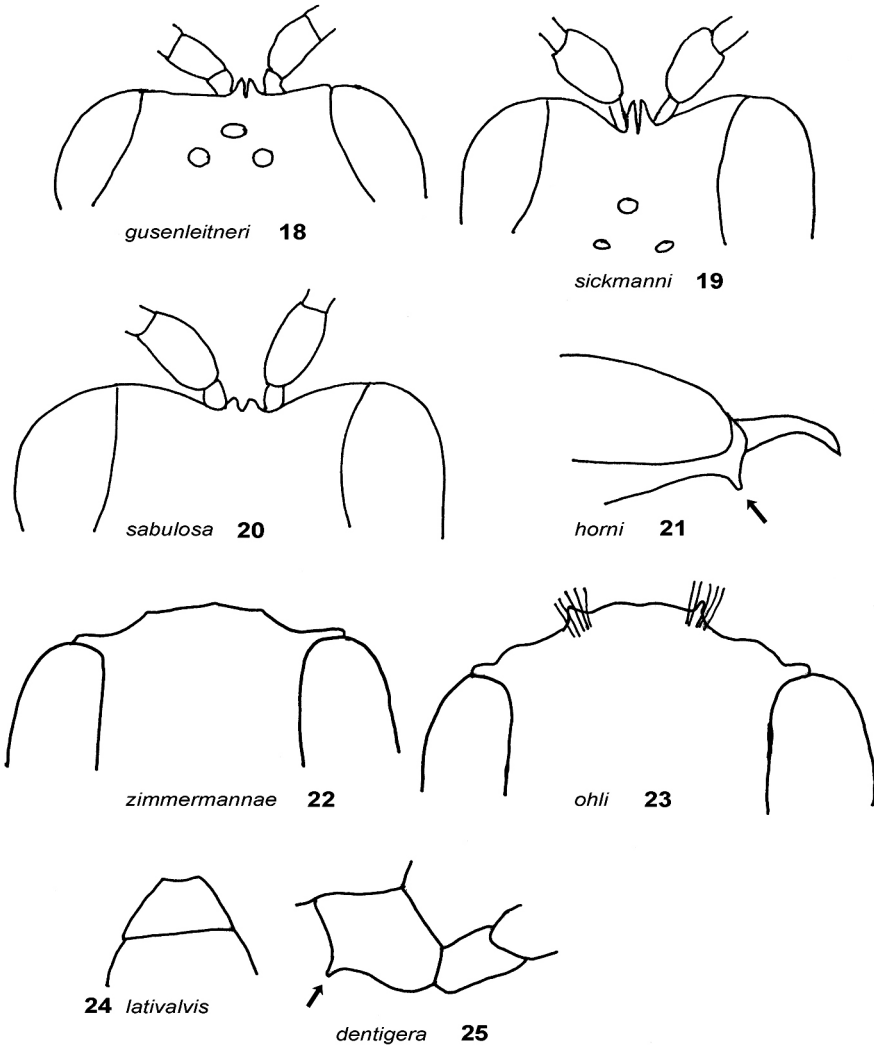


**Figs 1-10:** (1) *Eremnophila* and (2) *Ammophila*: lateral view of anterior half of thorax (es = episternal sulcus); (3) *Podalonia*: gastral segments I-II lateral and ventral; (4) *Ammophila*: gastral segments I-II lateral and ventral; (5) *Parapsammophila* and (6) *Eremochares*: posterior view of petiole socket, hindcoxa, and propodeal sternite (solid black); (7) lateral view of hindtarsal claw with basal tooth; (8) *Hoplammophila*: male genitalia; (9) *Parapsammophila*: foretarsomere I of female; (10) *Hoplammophila*: foretarsomere I of female; (BOHART & MENKE 1976).





**Figs 11-17:** (11) *A. sabulosa*: forewing; (12) *A. barbara*: forewing; (13) *A. campestris*: forewing; (14) *A. guichardi*: foretarsomeres; (15) *A. zimmermannae*: clypeus lateral; (16) *A. ohli*: clypeus lateral; (17) *A. guichardi*: clypeus.

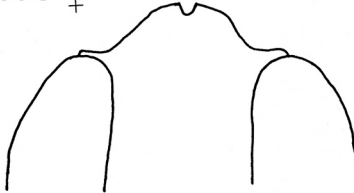


**Figs 18-25:** (18) *A. gusenleitneri*; (19) *A. sickmanni*; (20) *A. sabulosa*: supra-antennal lamellate projection in dorsal view; (21) *A. horni*: hypostomal carina in lateral view; (22) *A. zimmermannae*: clypeus; (23) *A. ohli*: clypeus; (24) *A. lativalvis*: ♀ gaster apex dorsally; (25) *A. dentigera*: forecoxa laterally.

**clypeus** ♀



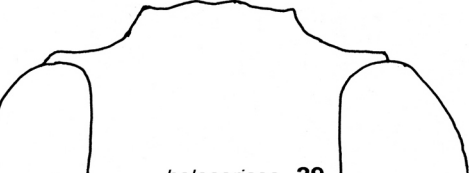
*albotomentosa* 26



*hemilauta* 27



*laevicollis* 28



*holosericea* 29



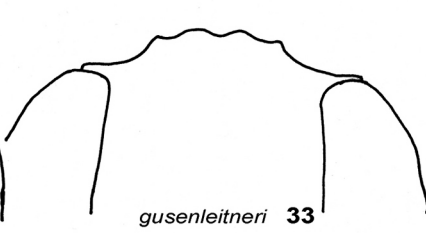
*dubia* 30



*poecilocnemis* 31



*insignis* 32



*gusenleitneri* 33



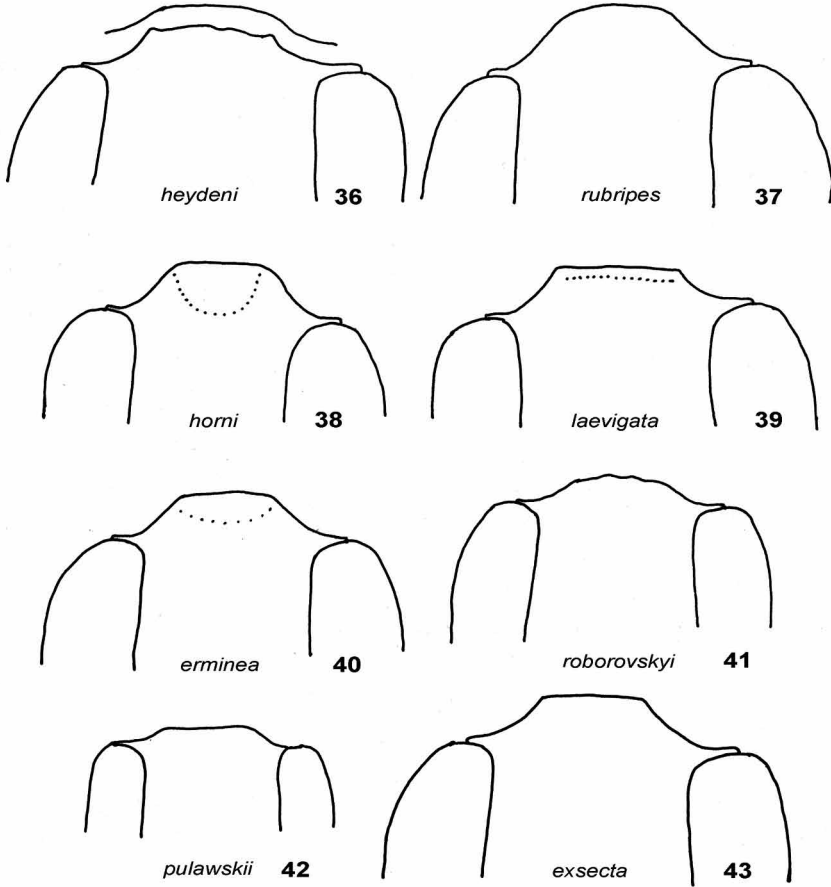
*smithii* 34



*vagabunda* 35

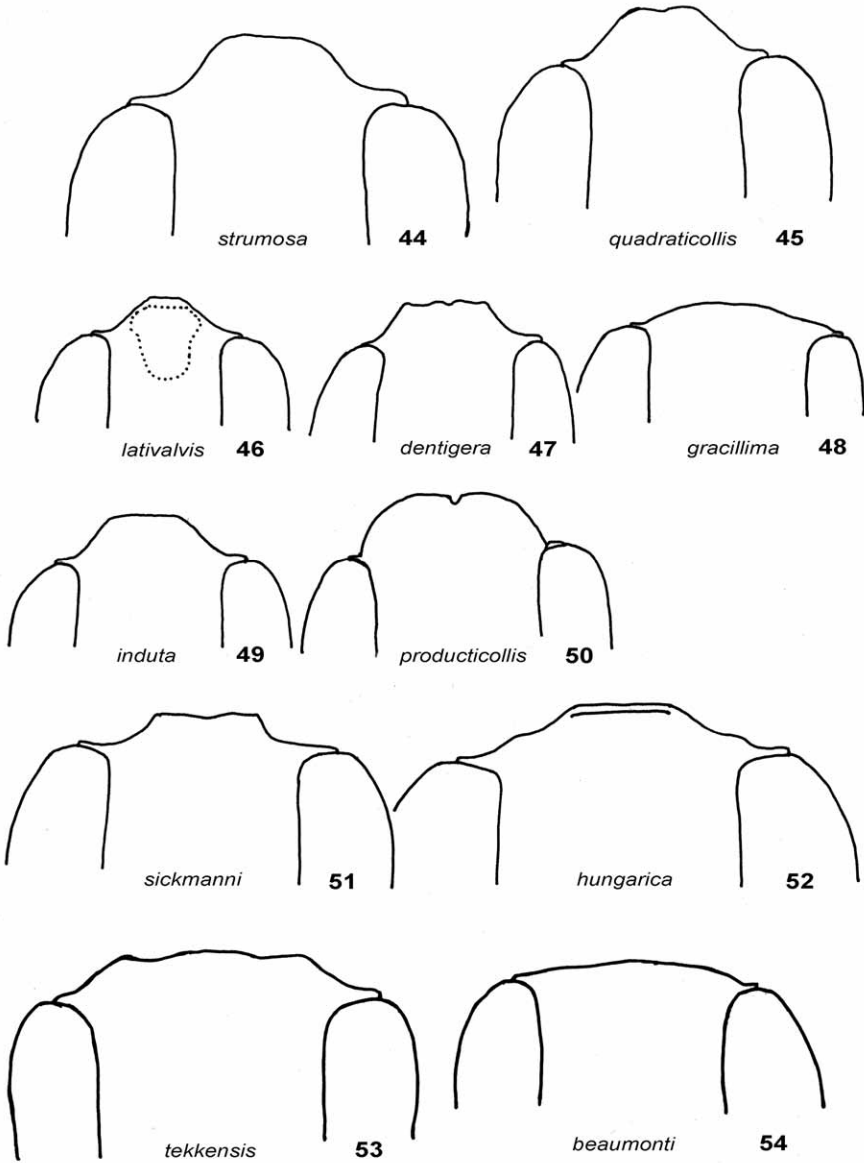
**Figs 26-35:** clypeus of female.

**clypeus ♀**



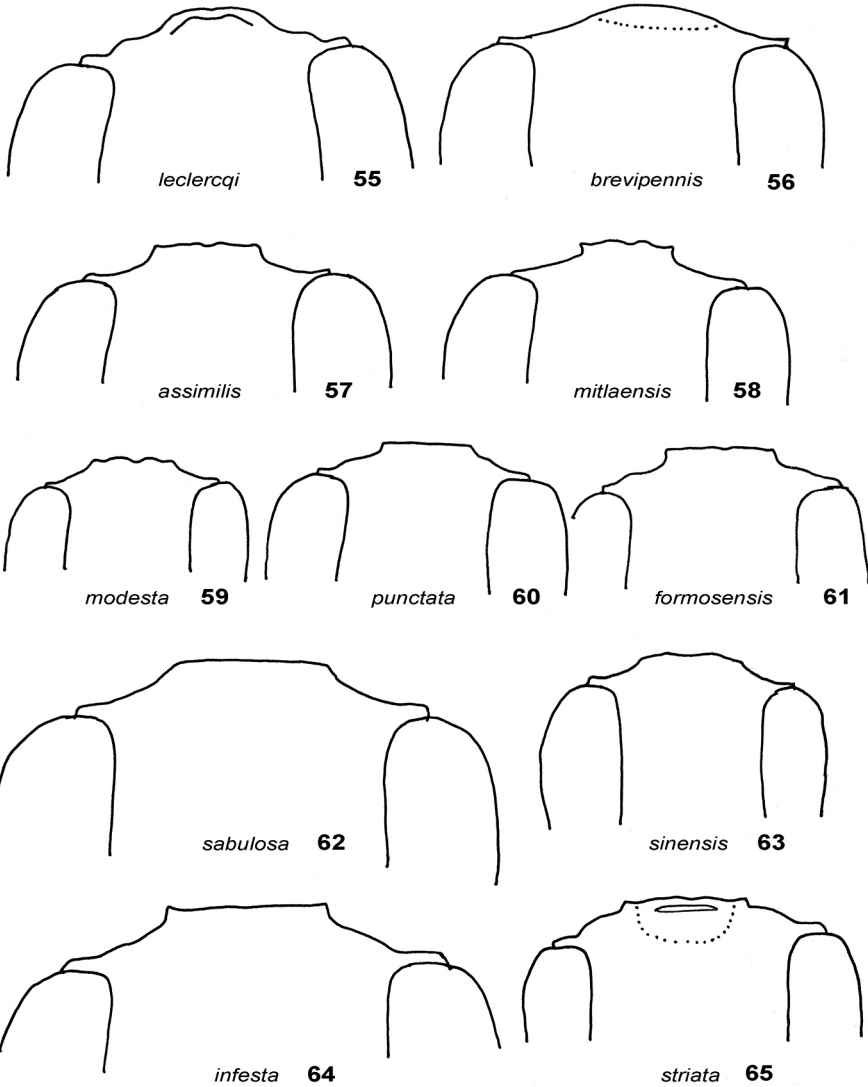
**Figs 36-43:** clypeus of female.

**clypeus ♀**



Figs 44-54: clypeus of female.

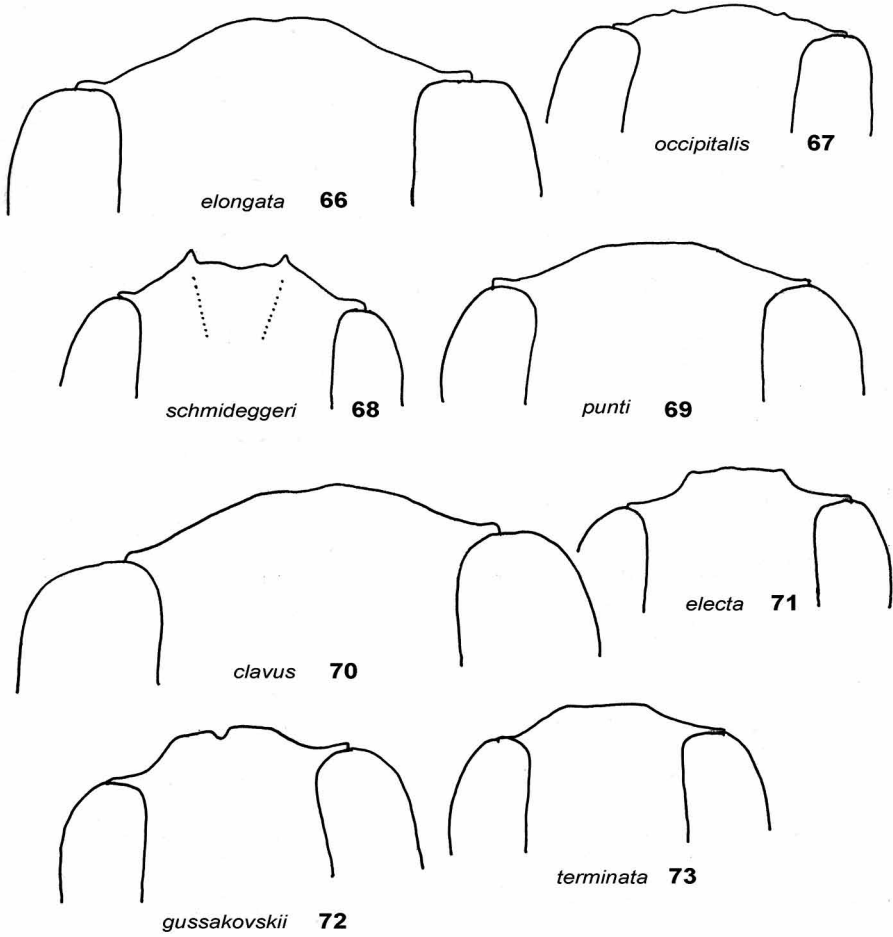
**clypeus ♀**



Figs 55-65: clypeus of female.

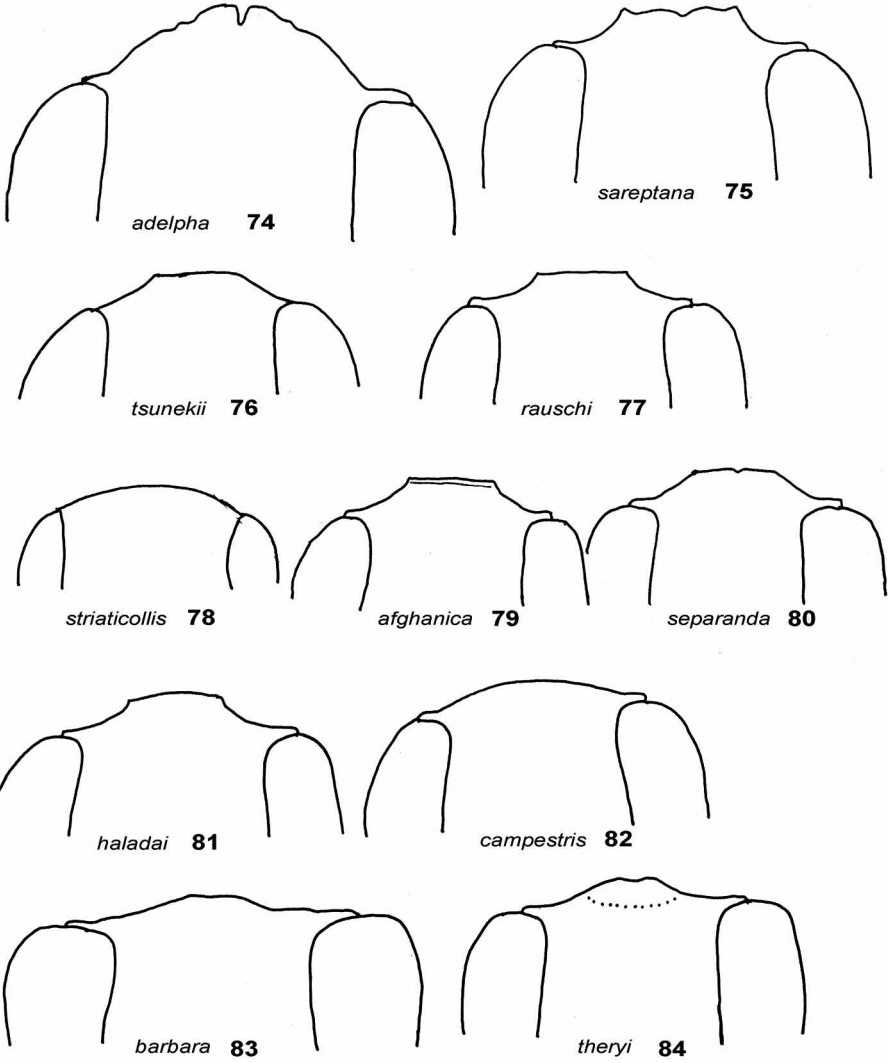


**clypeus ♀**



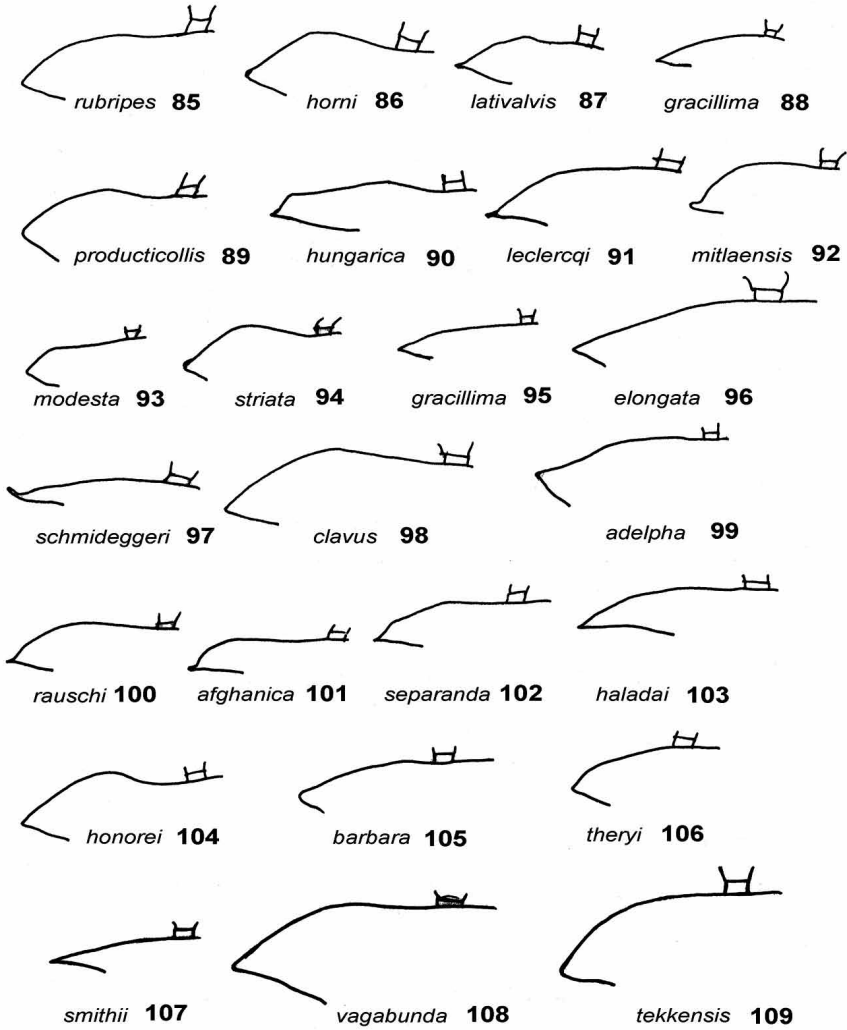
**Figs 66-73:** clypeus of female.

**clypeus** ♀



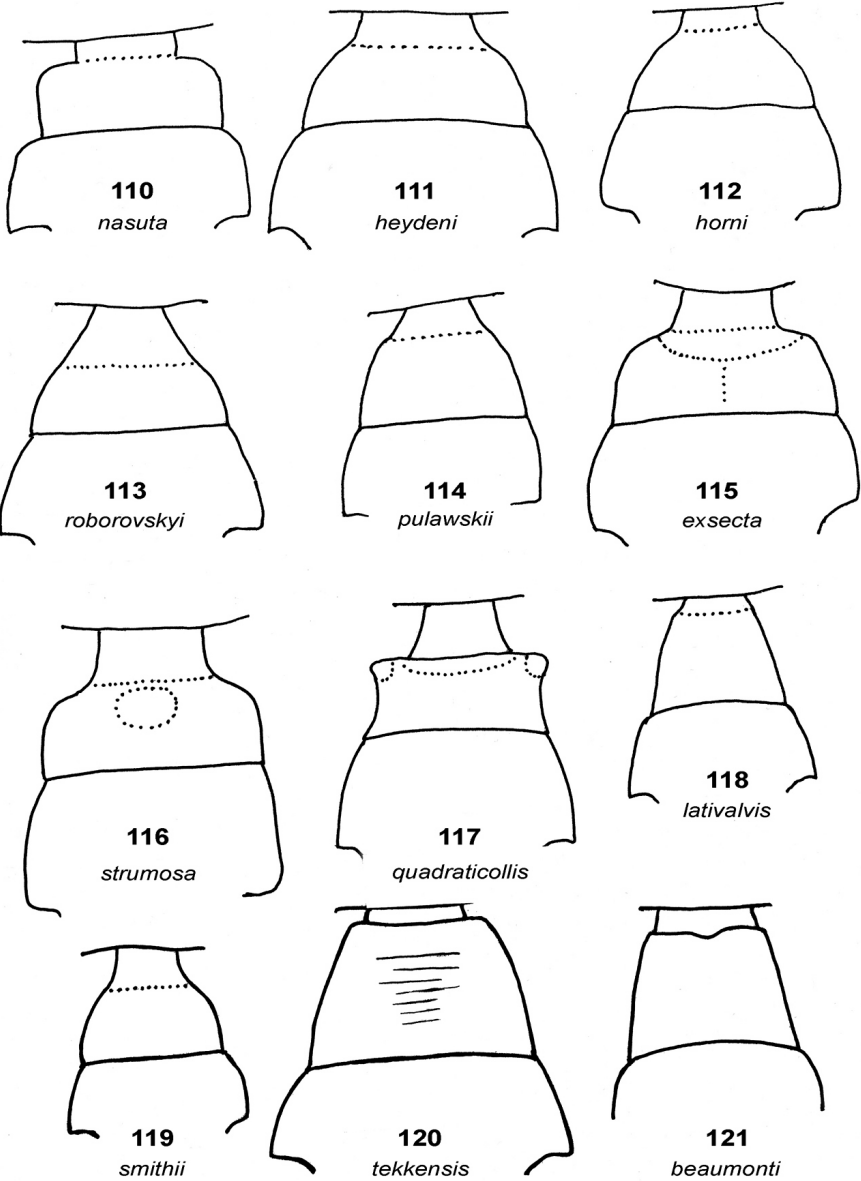
Figs 74-84: clypeus of female.

**clypeus lateral ♀**



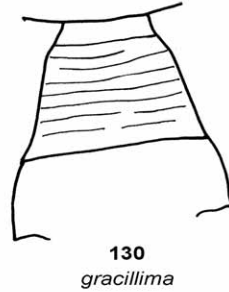
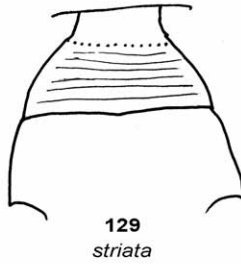
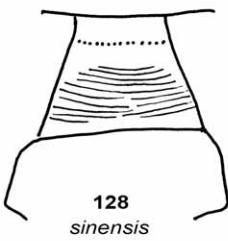
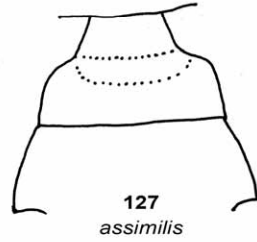
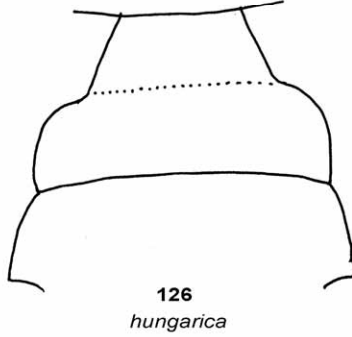
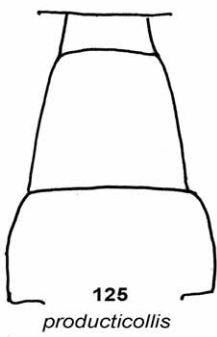
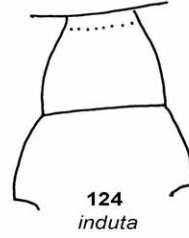
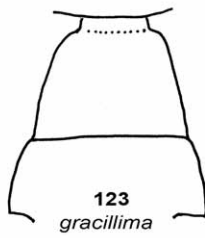
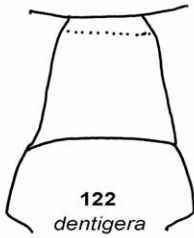
Figs 85-109: clypeus of female in lateral view.

**pronotal collar dorsal ♀**



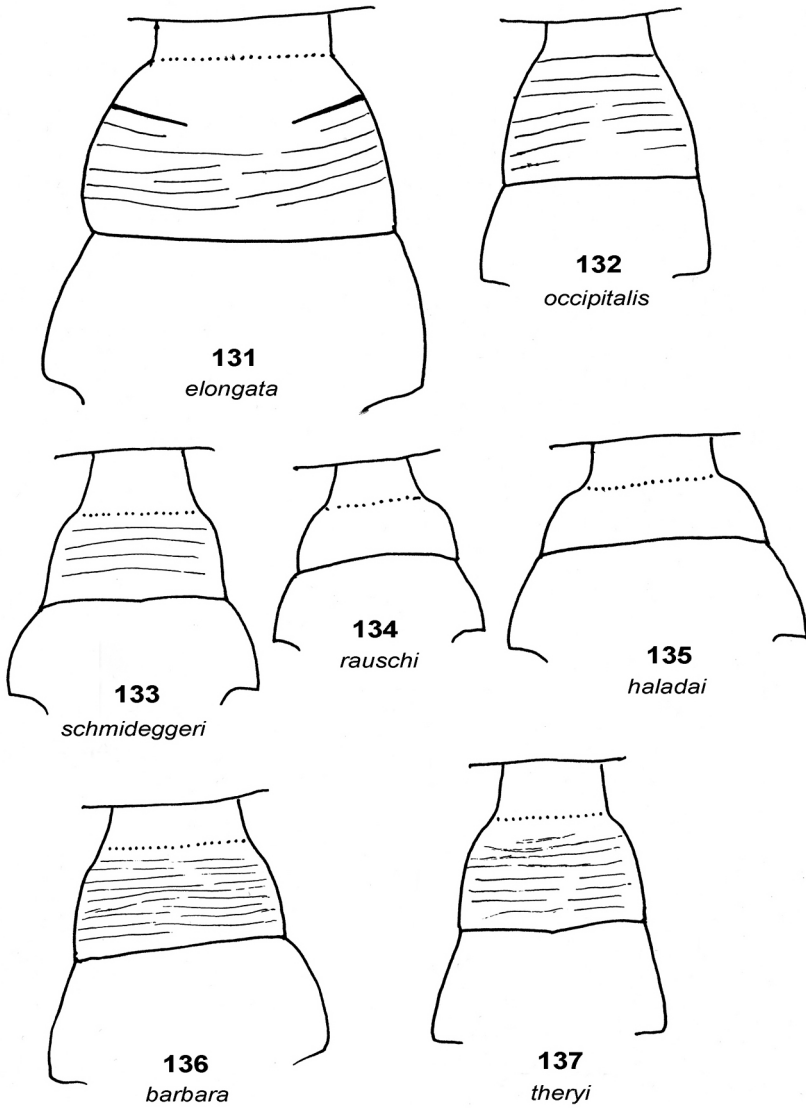
Figs 110-121: pronotal collar of female in dorsal view.

**pronotal collar dorsal ♀**



**Figs 122-130:** pronotal collar of female in dorsal view.

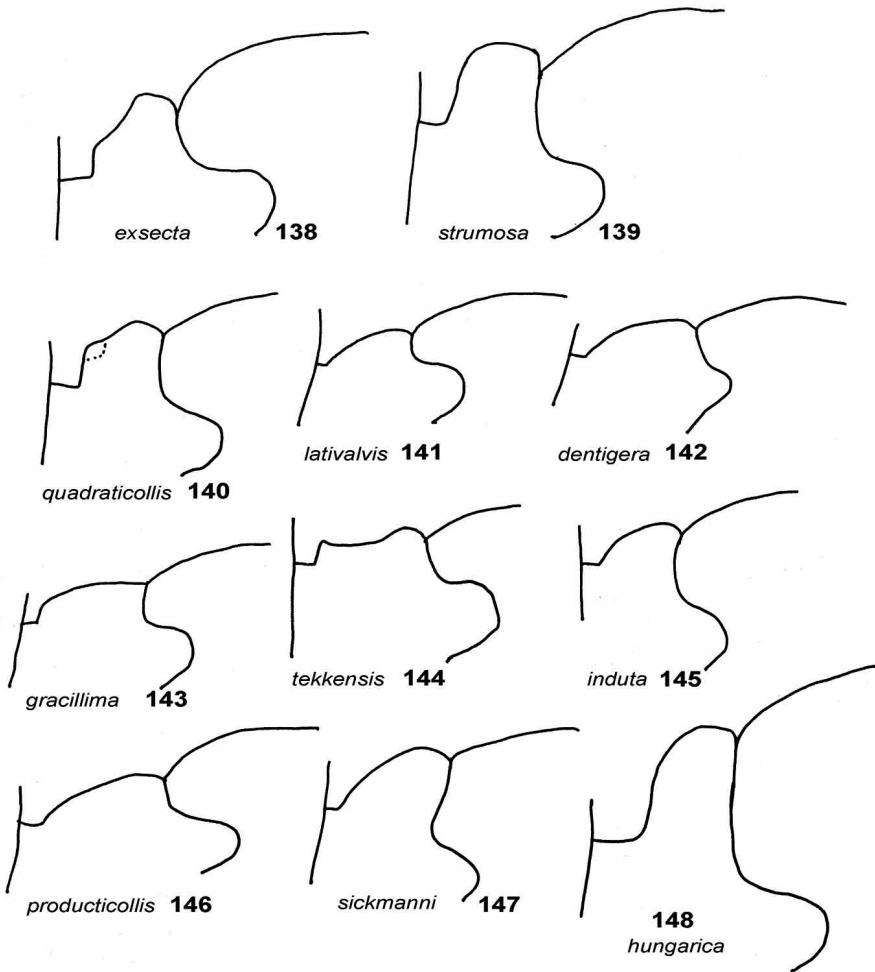
**pronotal collar dorsal ♀**



**Figs 131-137:** pronotal collar of female in dorsal view.

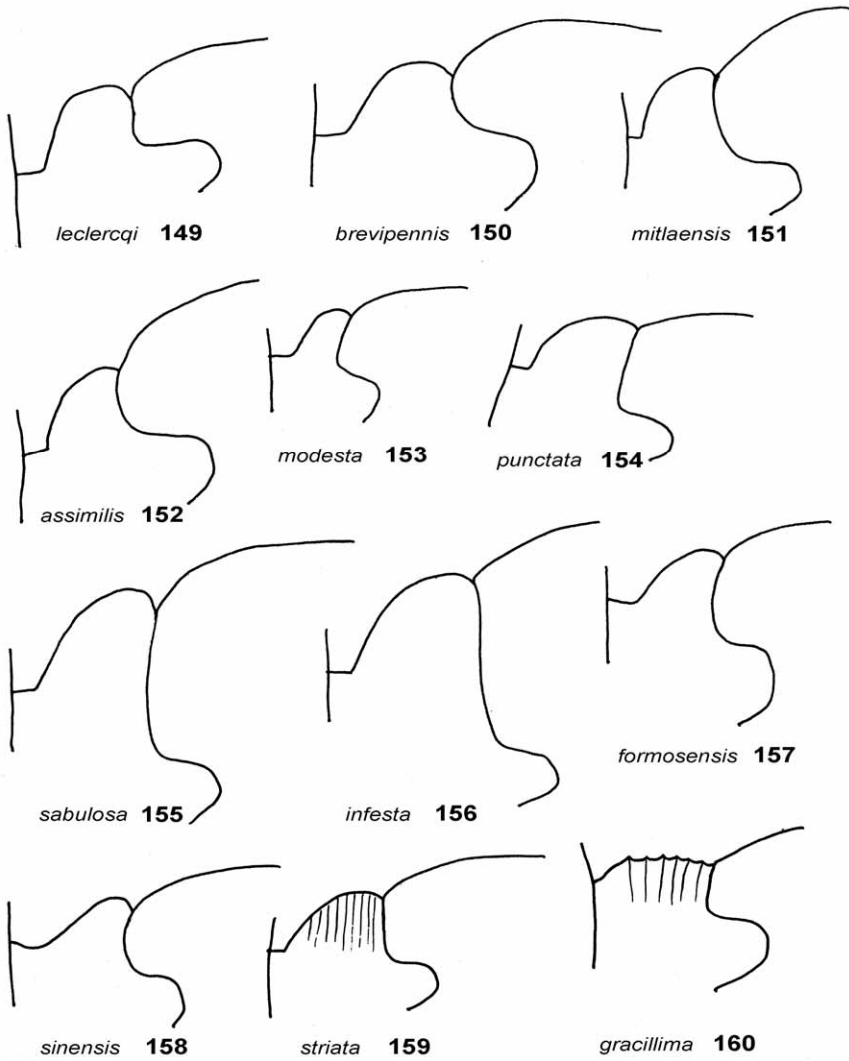


**pronotal collar lateral ♀**



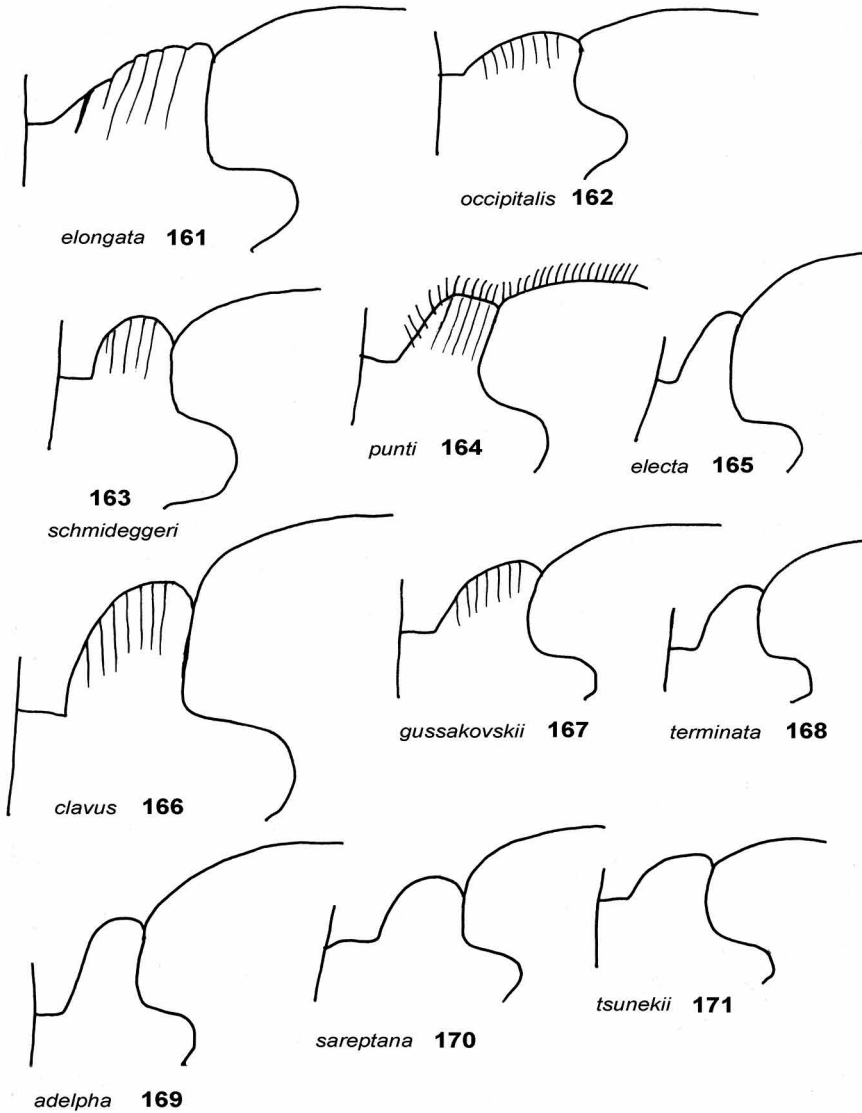
Figs 138-148: pronotal collar of female in lateral view.

**pronotal collar lateral ♀**



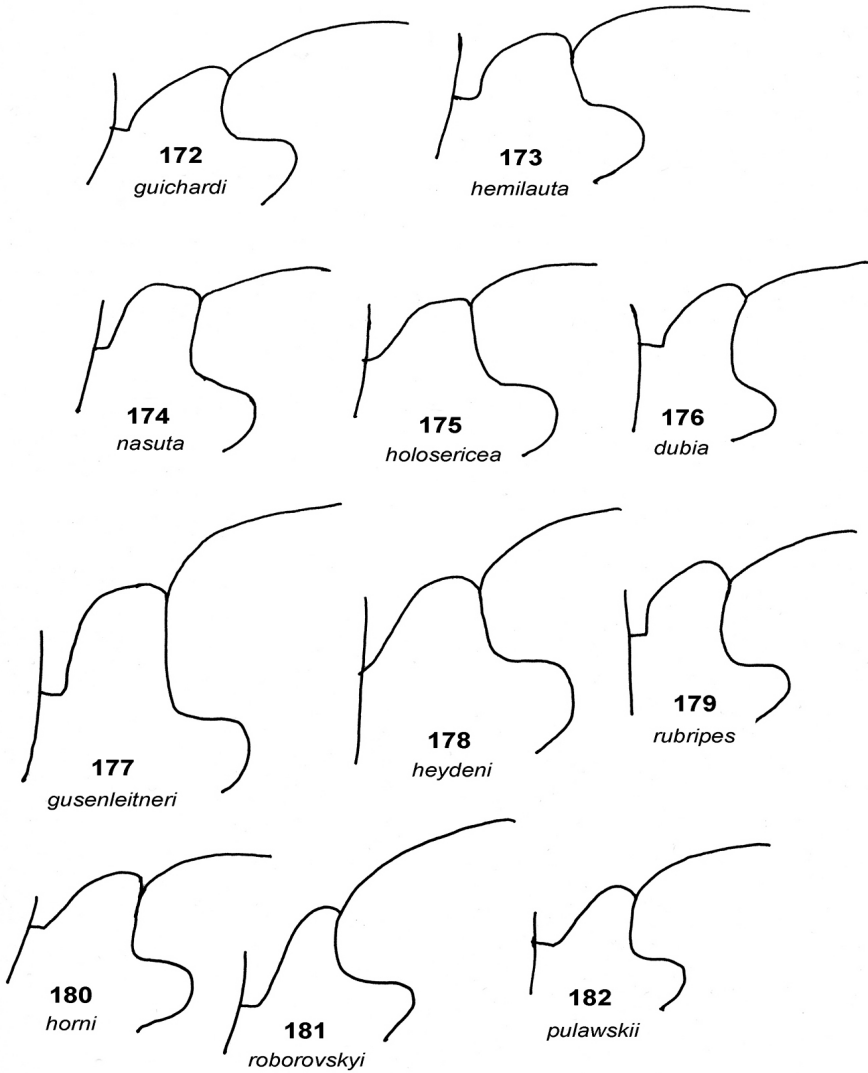
**Figs 149-160:** pronotal collar of female in lateral view.

**pronotal collar lateral ♀**



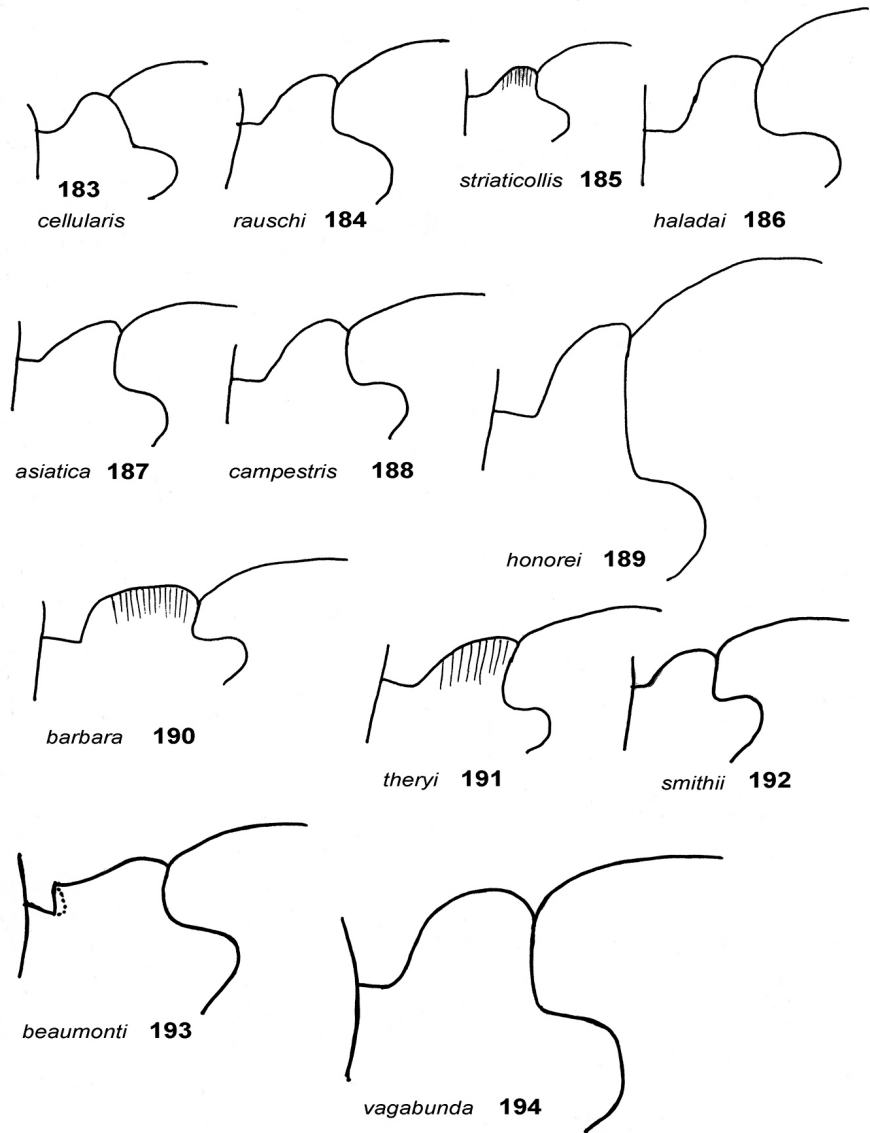
**Figs 161-171:** pronotal collar of female in lateral view.

**pronotal collar lateral ♀**



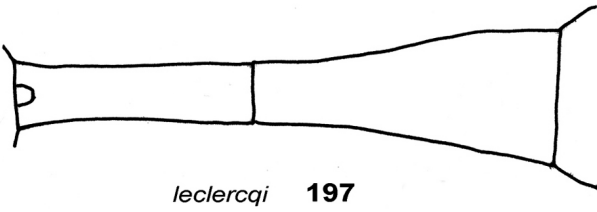
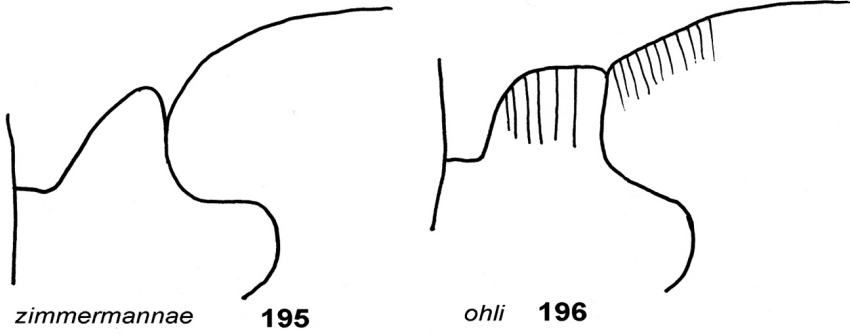
**Figs 172-182:** pronotal collar of female in lateral view.

**pronotal collar lateral ♀**



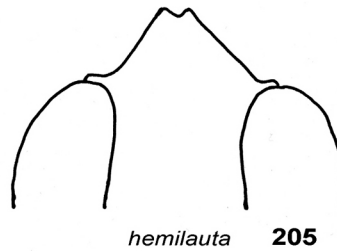
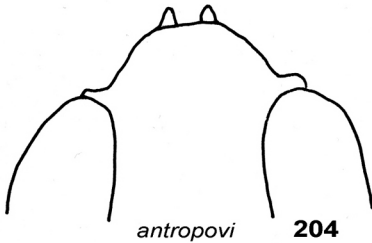
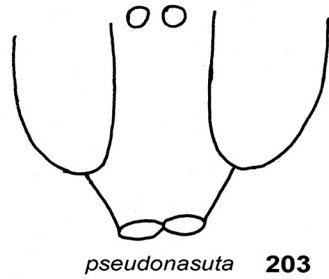
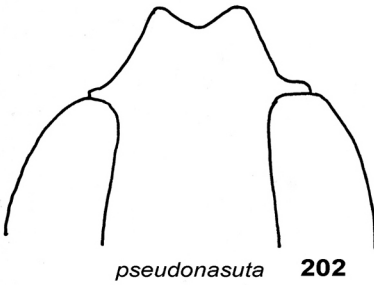
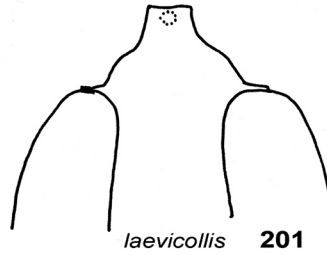
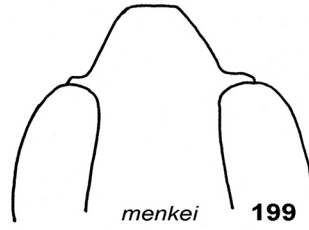
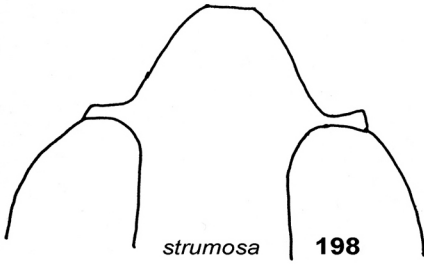
Figs 183-194: pronotal collar of female in lateral view.

**pronotal collar lateral ♀**



**Figs 195-197:** (195, 196) pronotal collar of female in lateral view; (197) *A. leclercqi*: petiole and tergum I in dorsal view.

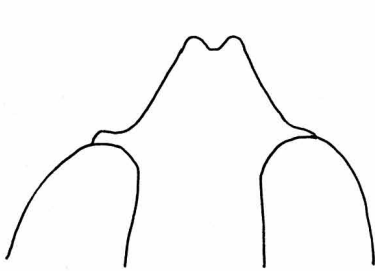
**clypeus** ♂



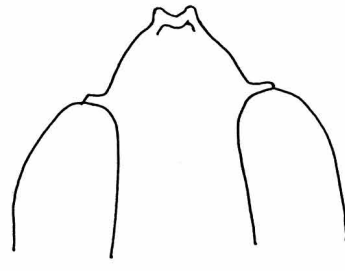
Figs 198-205: male clypeus.



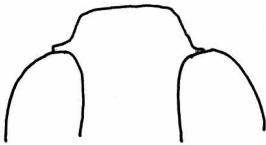
**clypeus** ♂



*quadraticollis* **206**



*atlantica* **207**



*producticollis* **208**



*induta* **209**



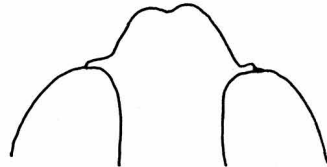
*lativalvis* **210**



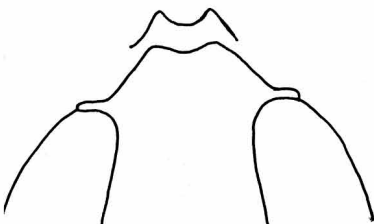
*beaumonti* **211**



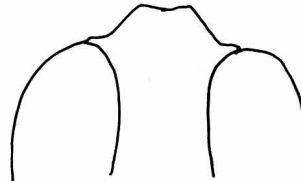
*dentigera* **212**



*punctata* **213**



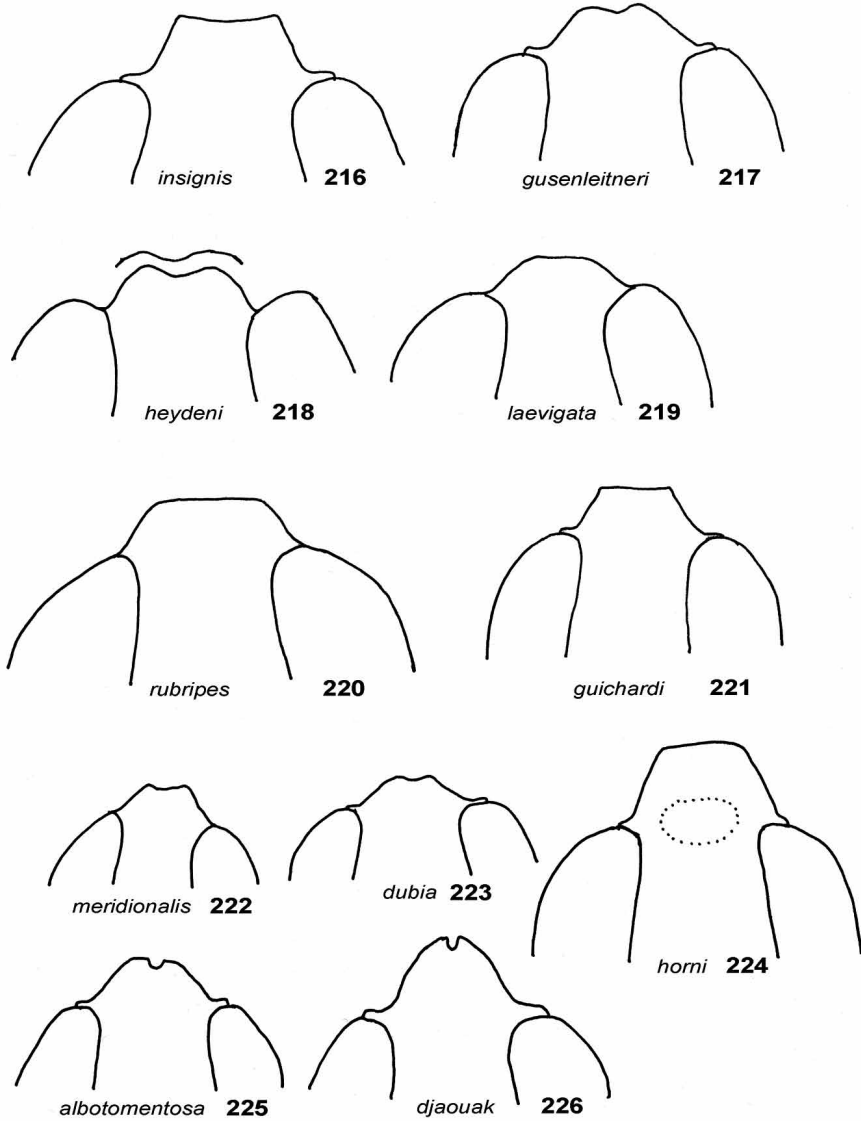
*sickmanni* **214**



*infesta* **215**

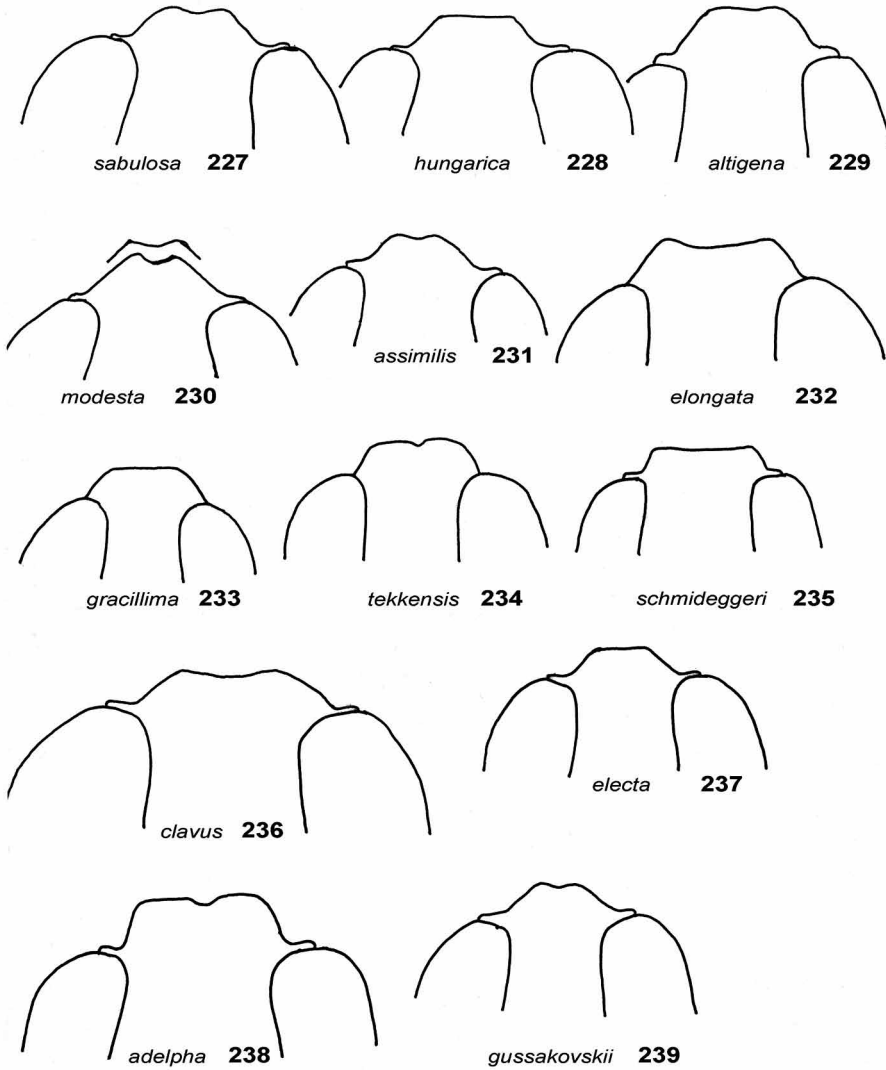
**Figs 206-215: male clypeus.**

**clypeus** ♂



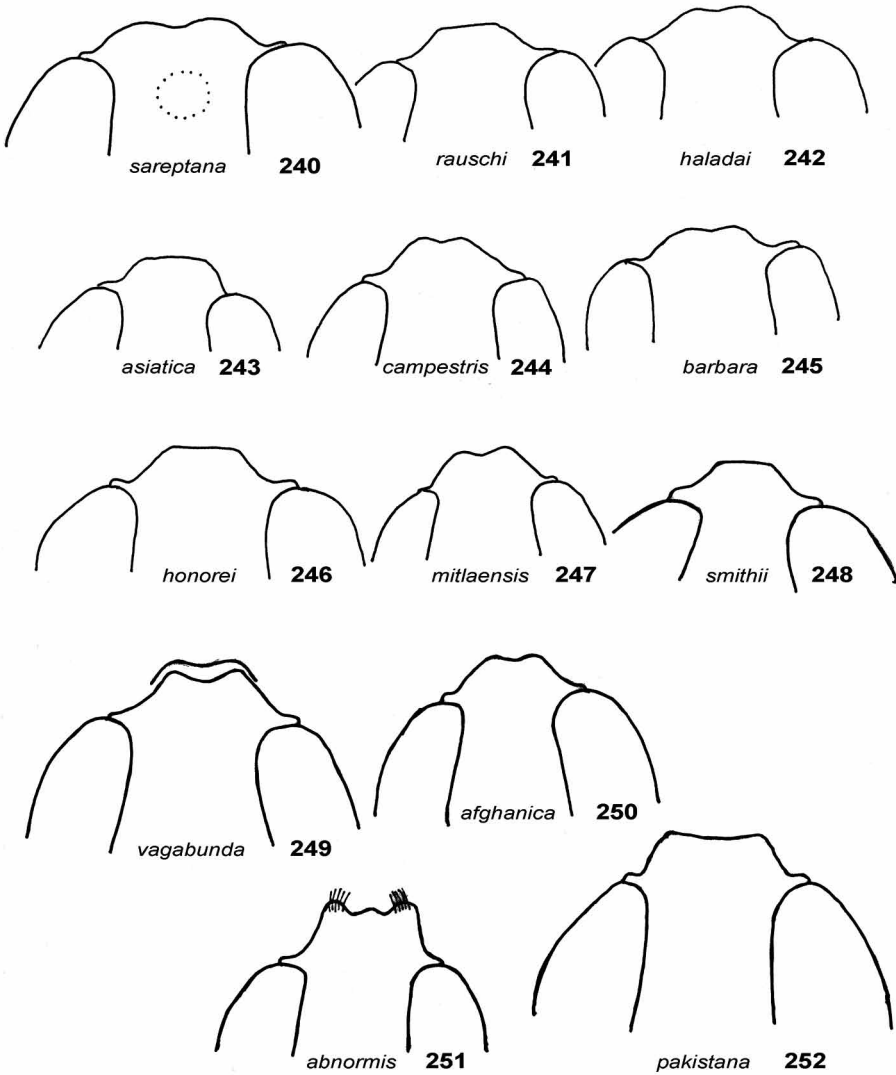
Figs 216-226: male clypeus.

**clypeus** ♂



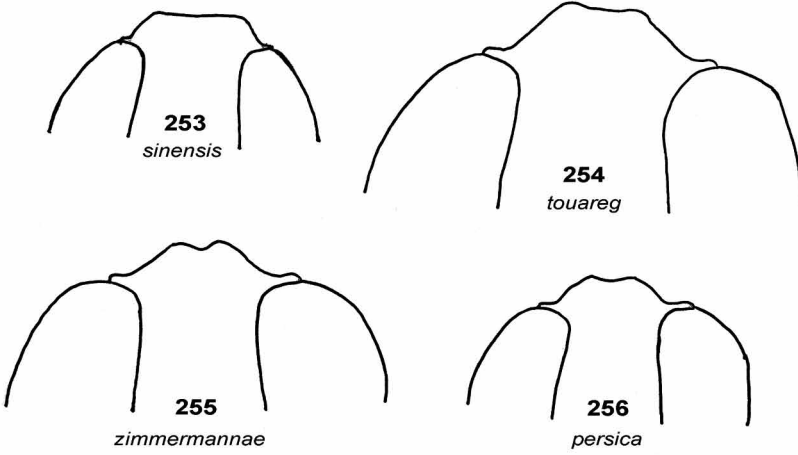
Figs 227-239: male clypeus.

**clypeus** ♂

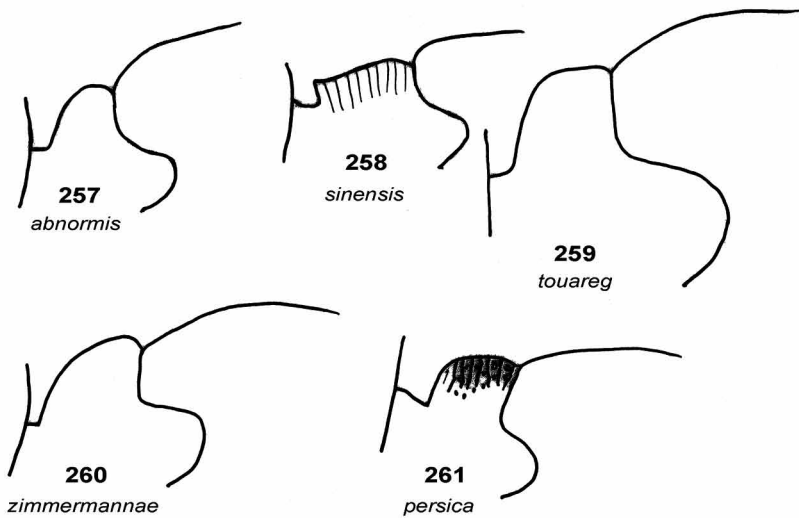


Figs 240-252: male clypeus.

**clypeus** ♂

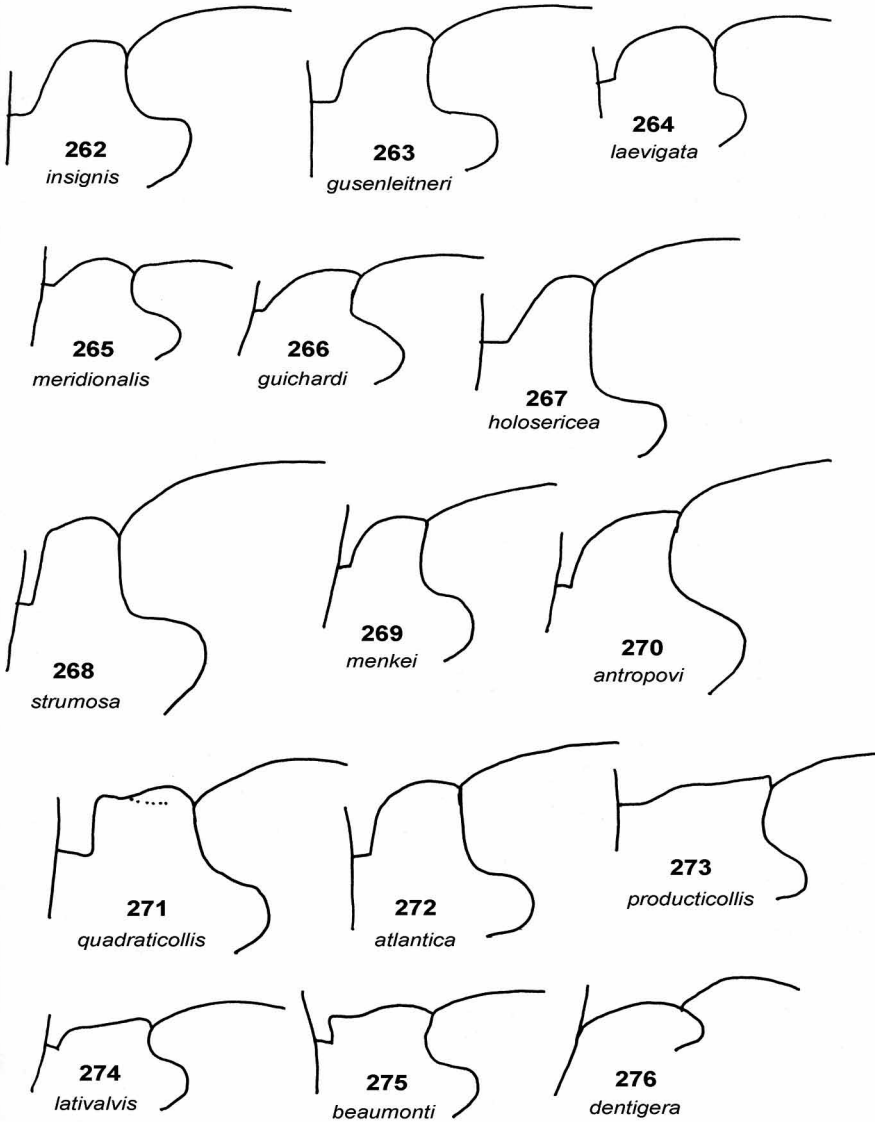


**pronotal collar lateral** ♂



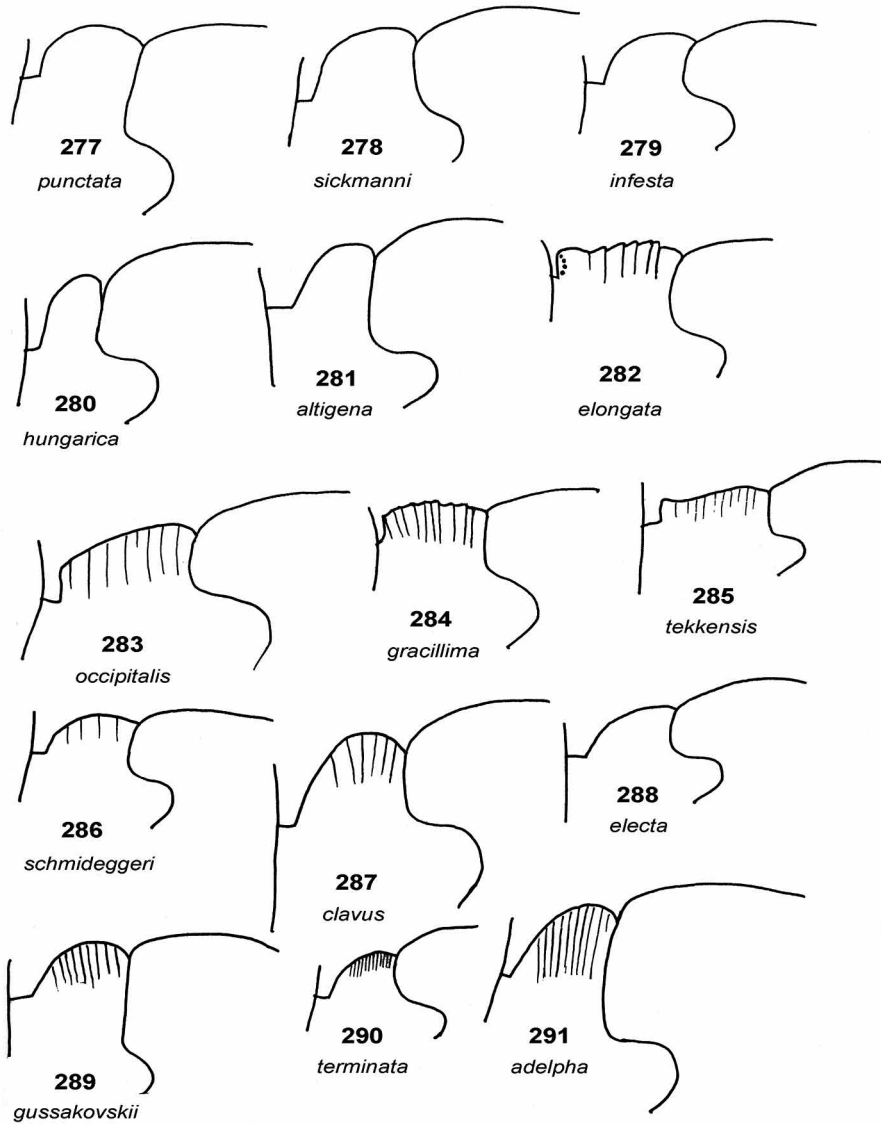
Figs 253-261: (253-256) male clypeus; (257-261) pronotal collar of male in lateral view.

**pronotal collar lateral ♂**



Figs 262-276: pronotal collar of male in lateral view.

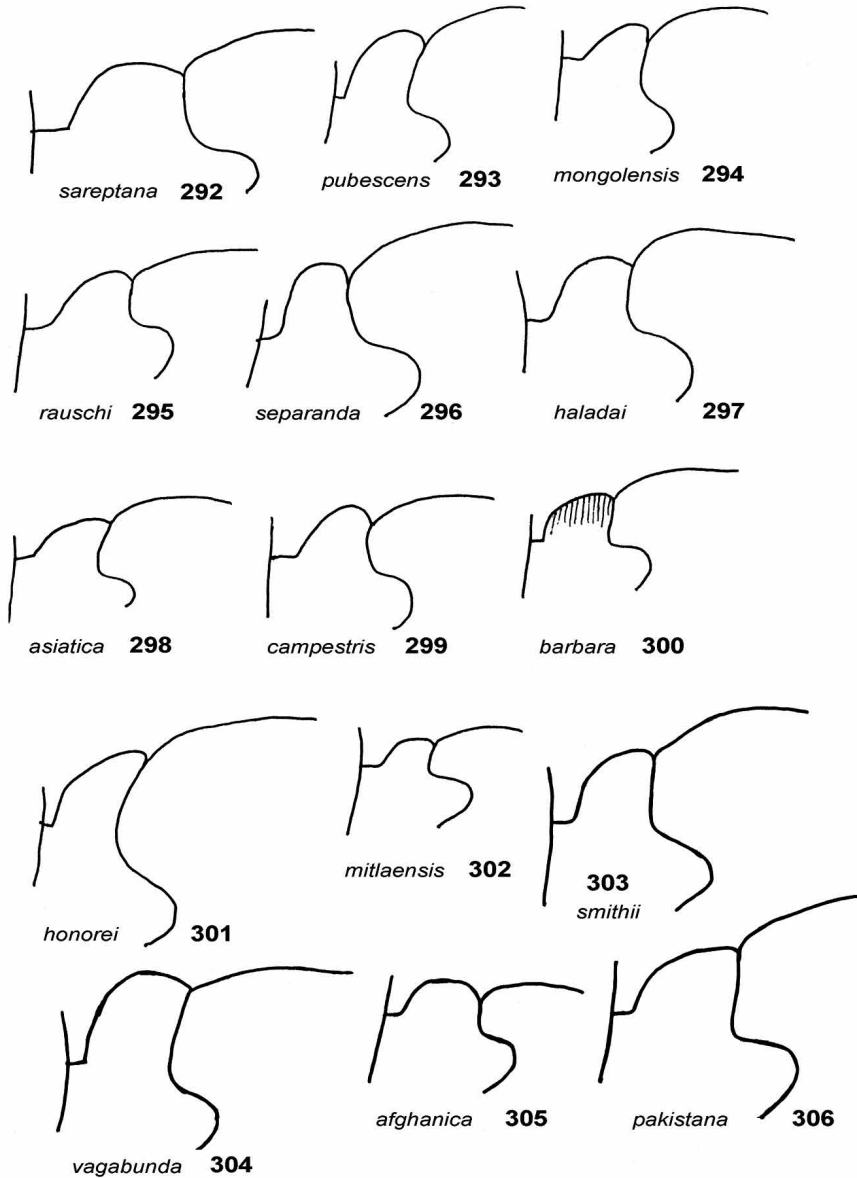
**pronotal collar lateral** ♂



Figs 277-291: pronotal collar of male in lateral view.

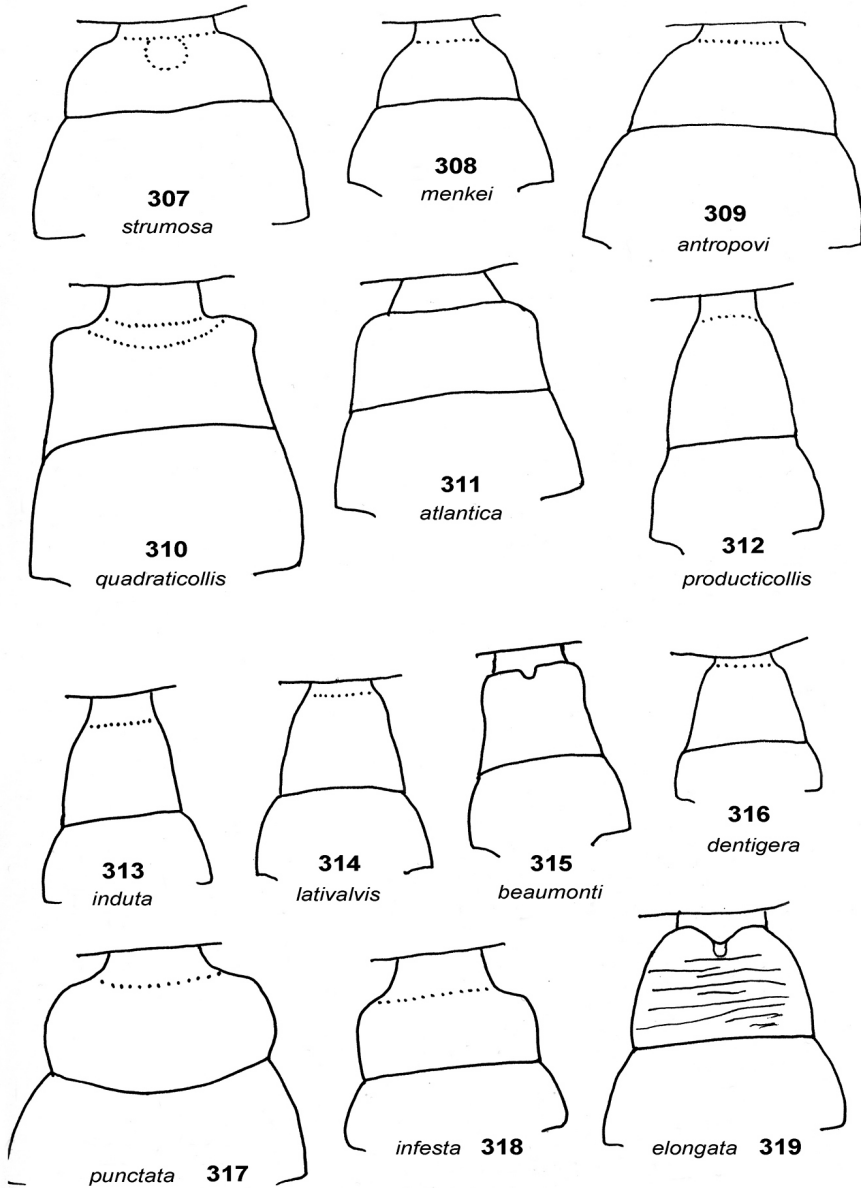


**pronotal collar lateral ♂**



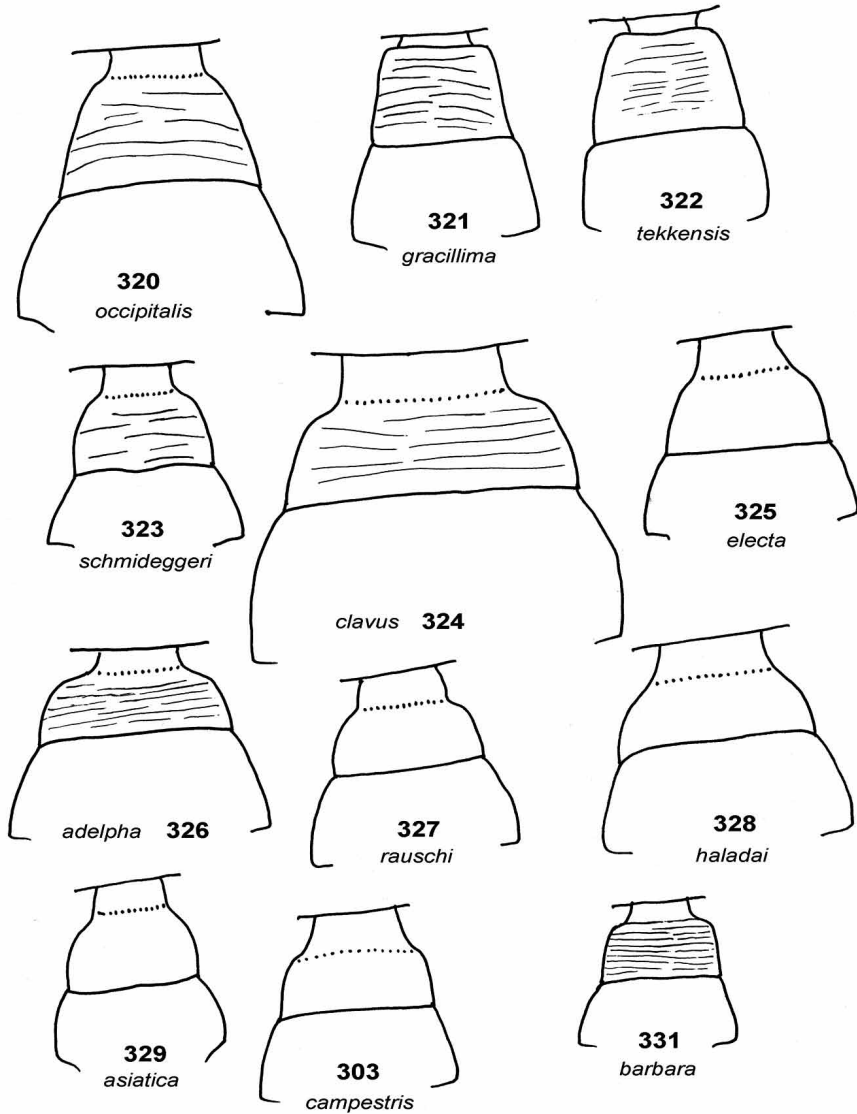
**Figs 292-306:** pronotal collar of male in lateral view.

pronotal collar dorsal ♂



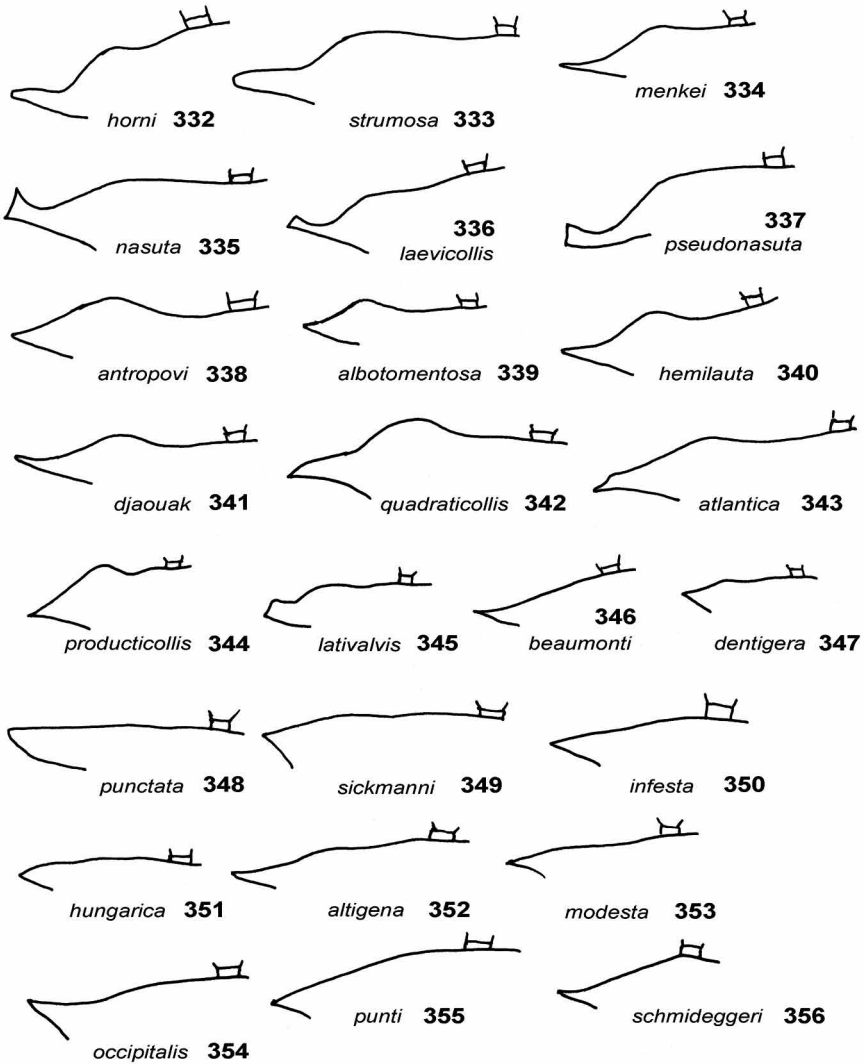
Figs 307-319: pronotal collar of male in dorsal view.

**pronotal collar dorsal** ♂



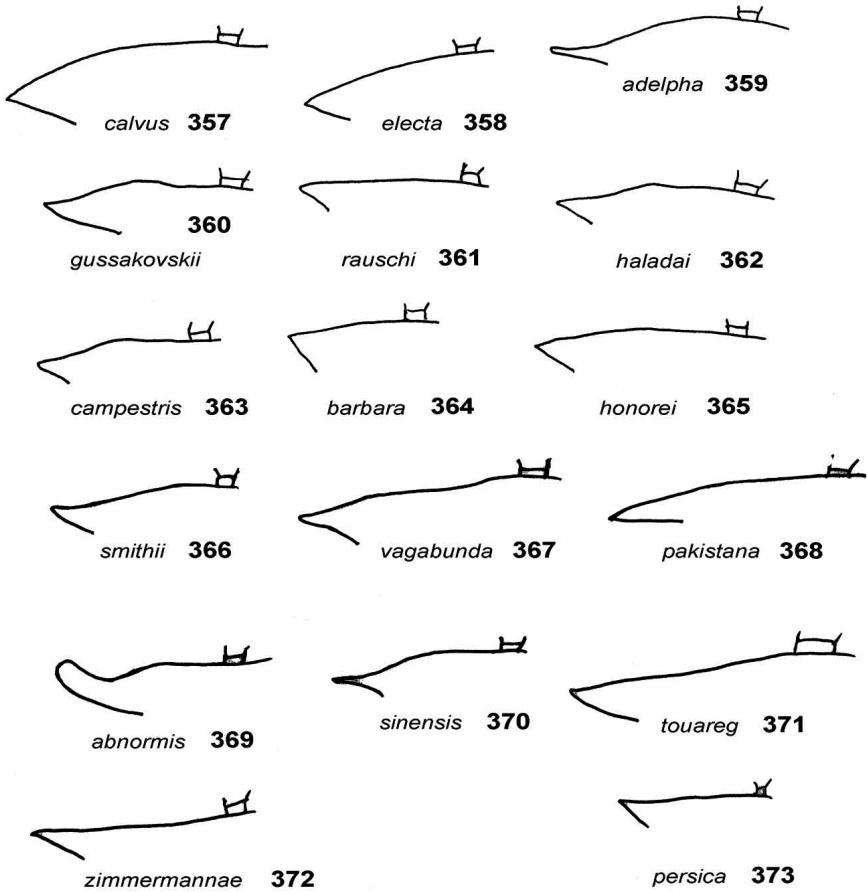
**Figs 320-331:** pronotal collar of male in dorsal view.

**clypeus lateral** ♂



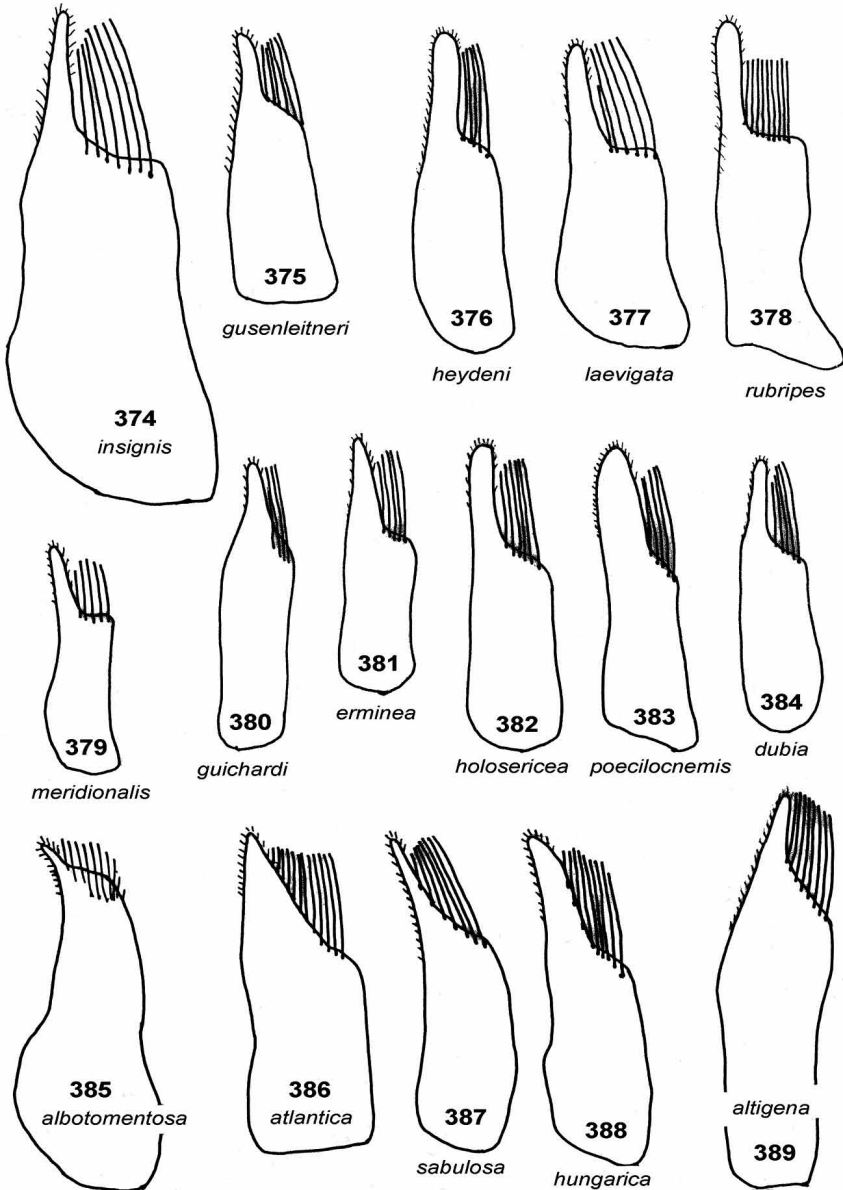
Figs 332-356: male clypeus in lateral view.

**clypeus lateral ♂**



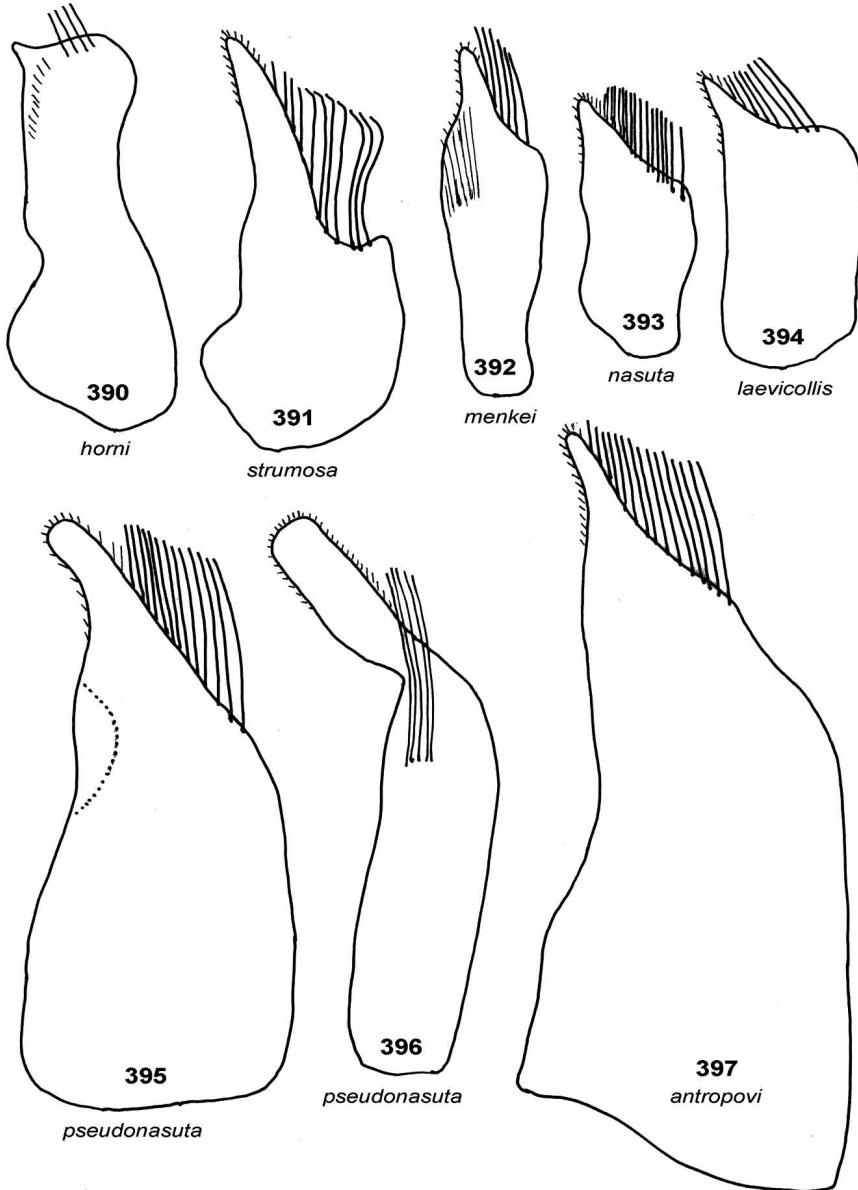
Figs 357-373: male clypeus in lateral view.

**gonostyle lateral**



Figs 374-389: male genitalia: gonostyle in lateral view.

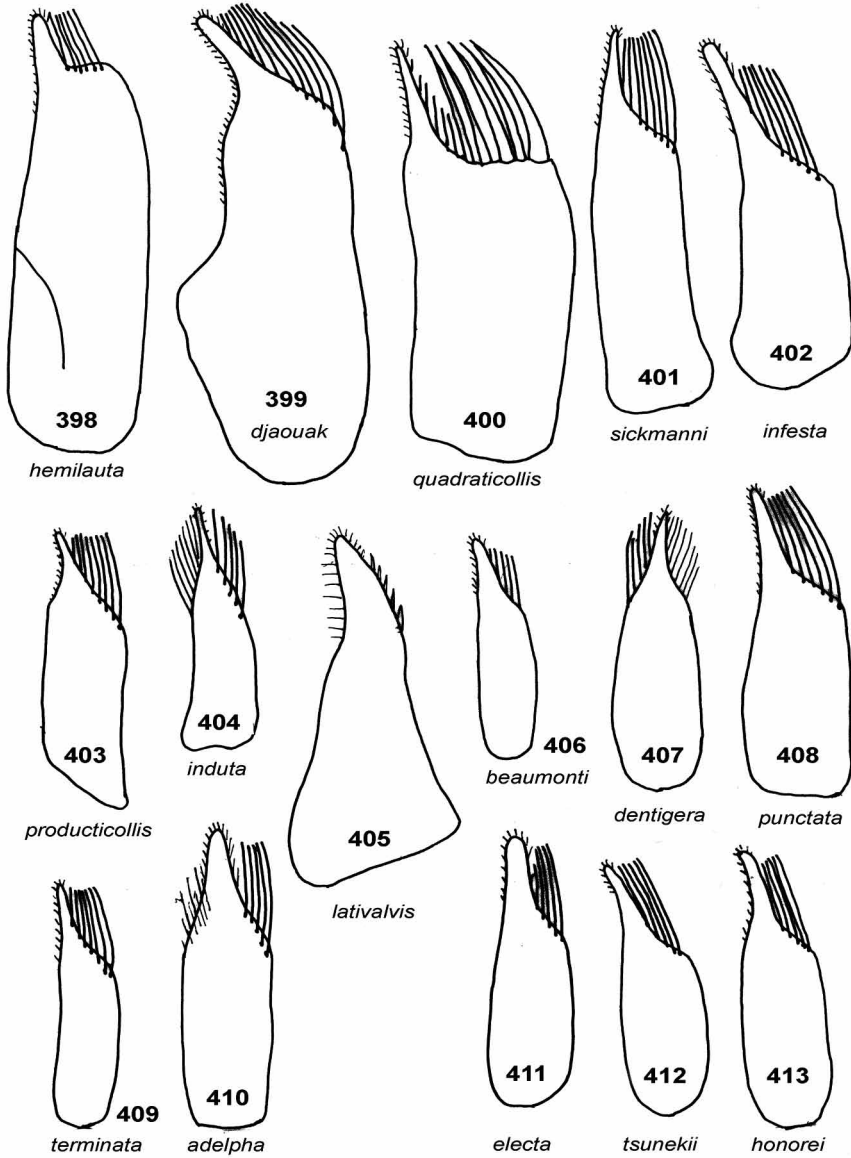
**gonostyle lateral**



Figs 390-397: male genitalia: gonostyle in lateral view.

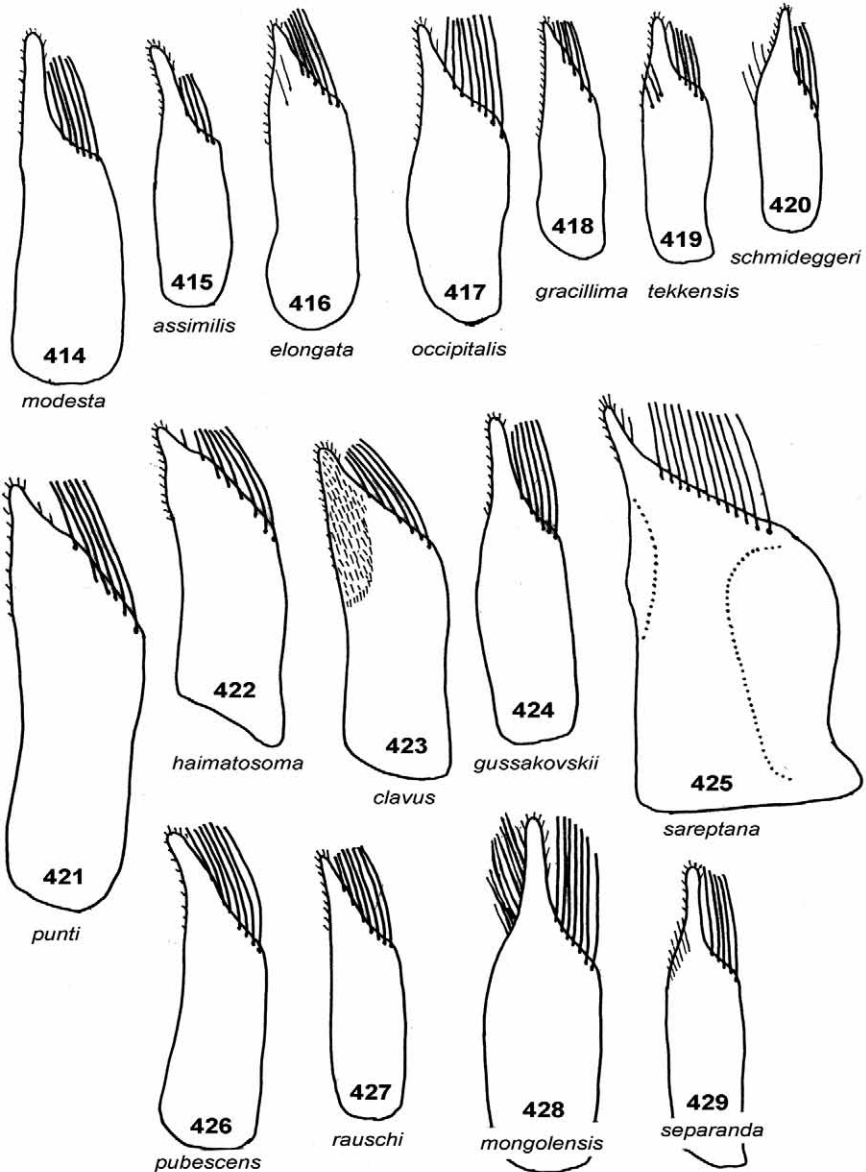


### gonostyle lateral



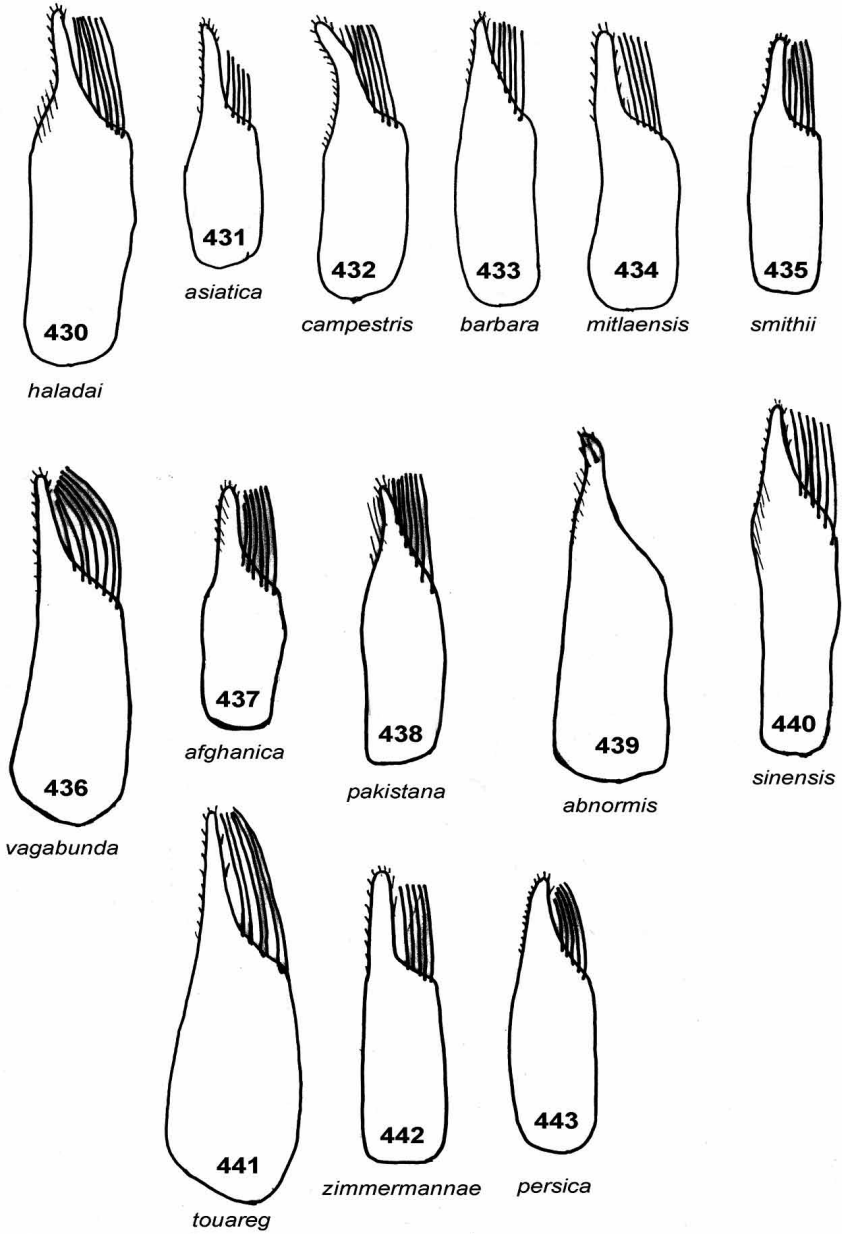
Figs 398-413: male genitalia: gonostyle in lateral view.

**gonostyle lateral**



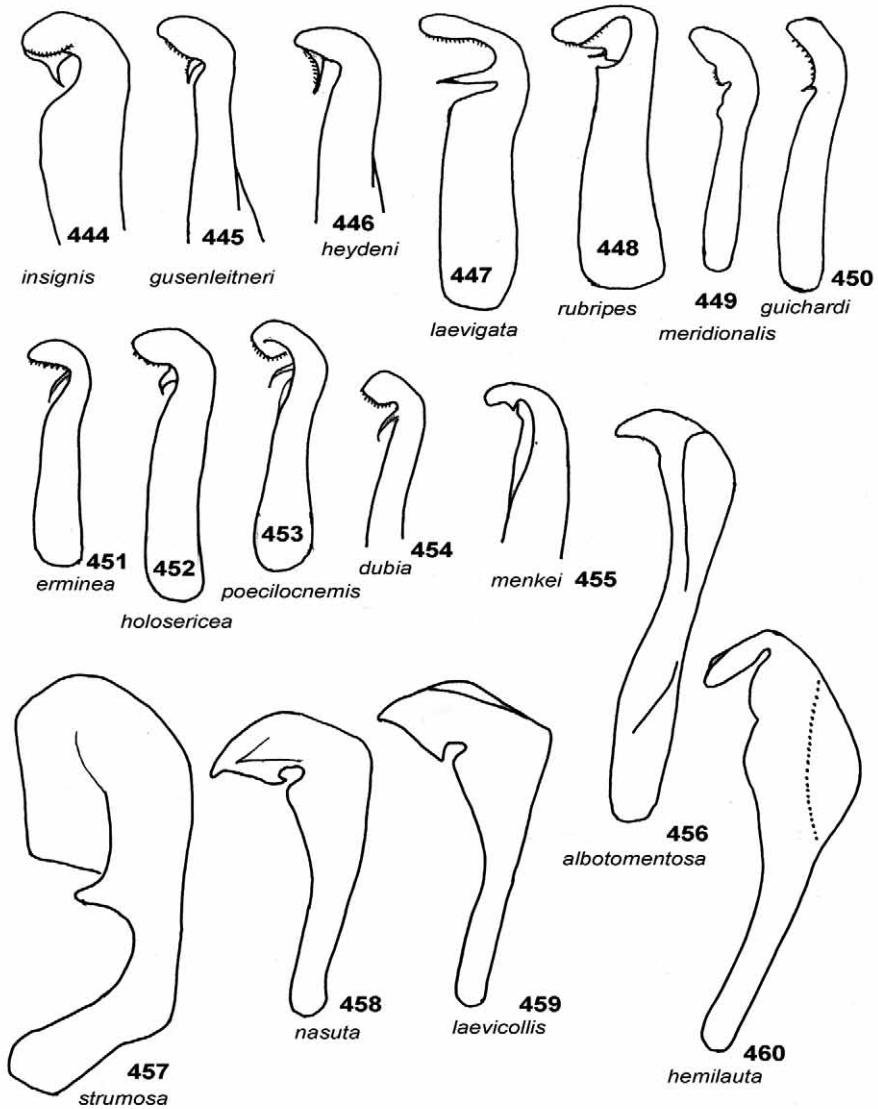
Figs 414-429: male genitalia: gonostyle in lateral view.

**gonostyle lateral**



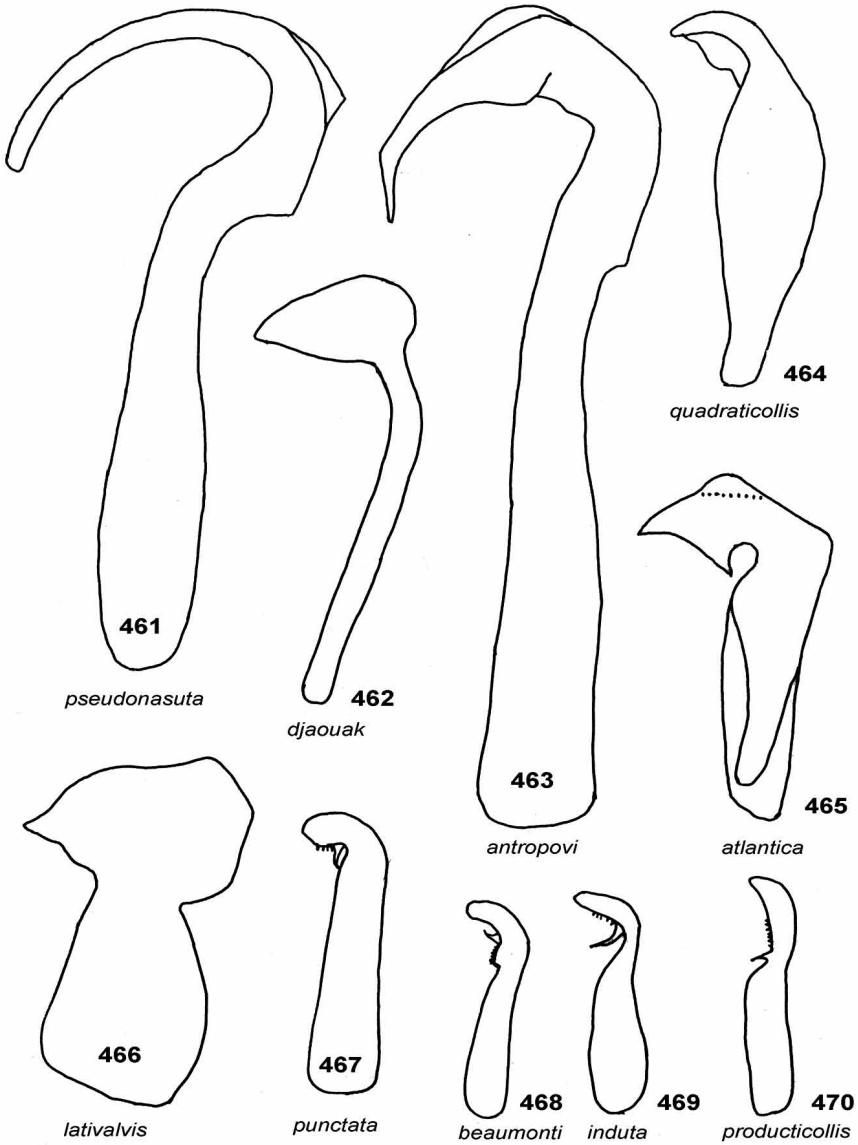
Figs 430-443: male genitalia: gonostyle in lateral view.

**penis valves lateral**



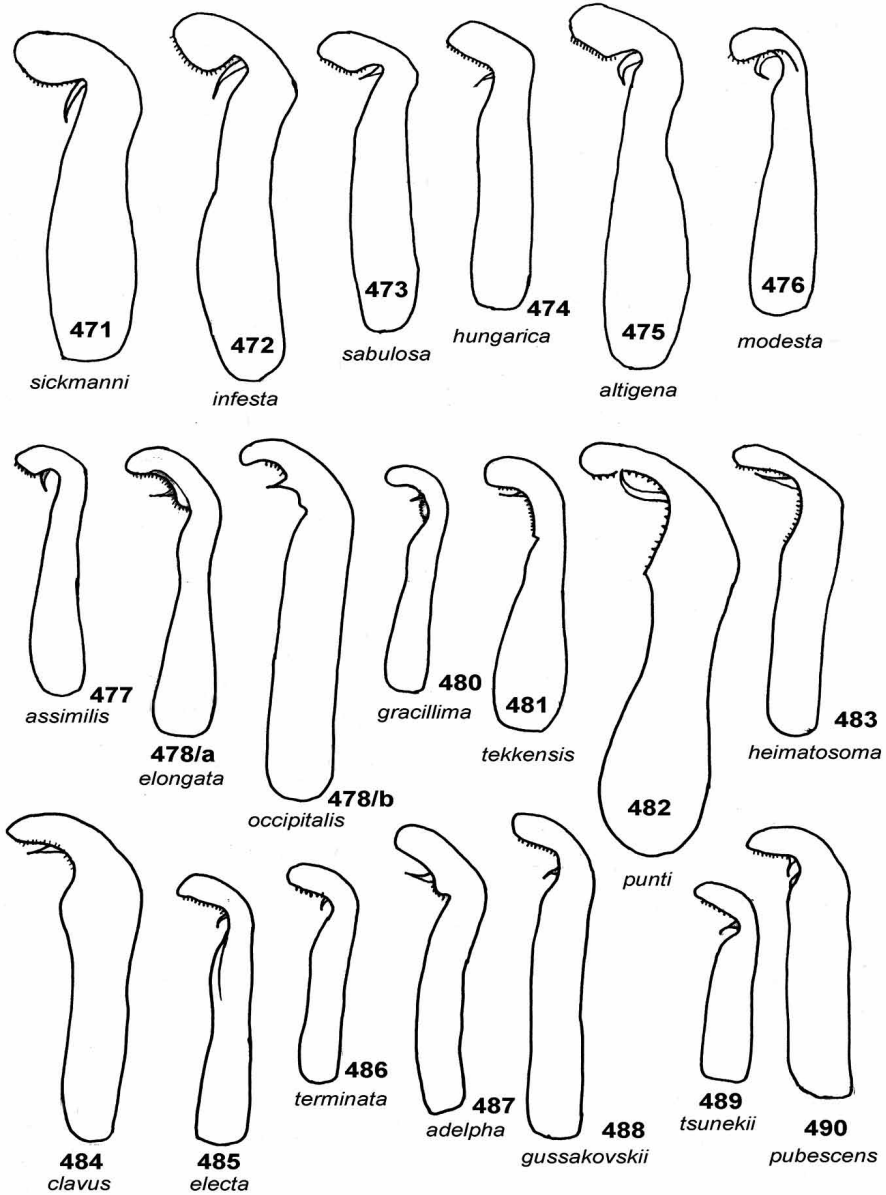
Figs 444-460: male genitalia: penis valve in lateral view.

**penis valves lateral**



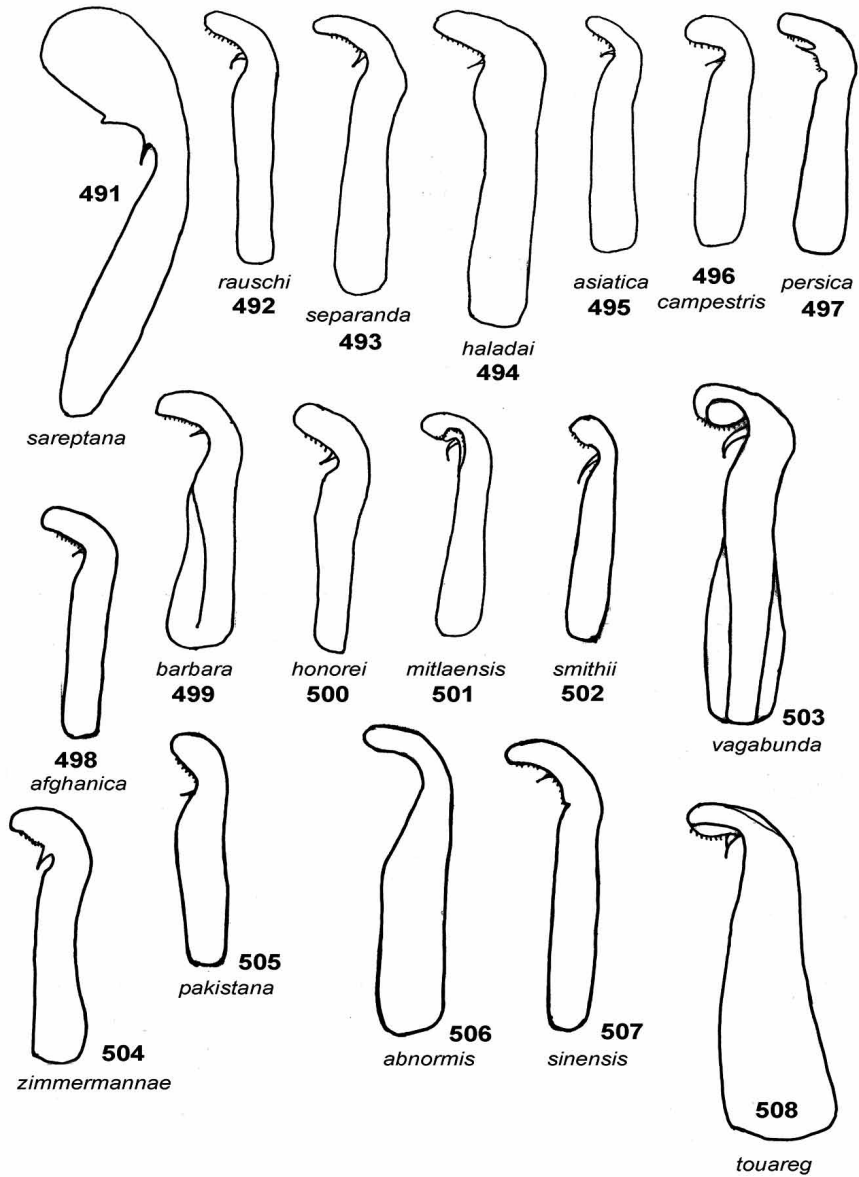
Figs 461-470: male genitalia: penis valve in lateral view.

penis valves lateral



Figs 471-490: male genitalia: penis valve in lateral view.

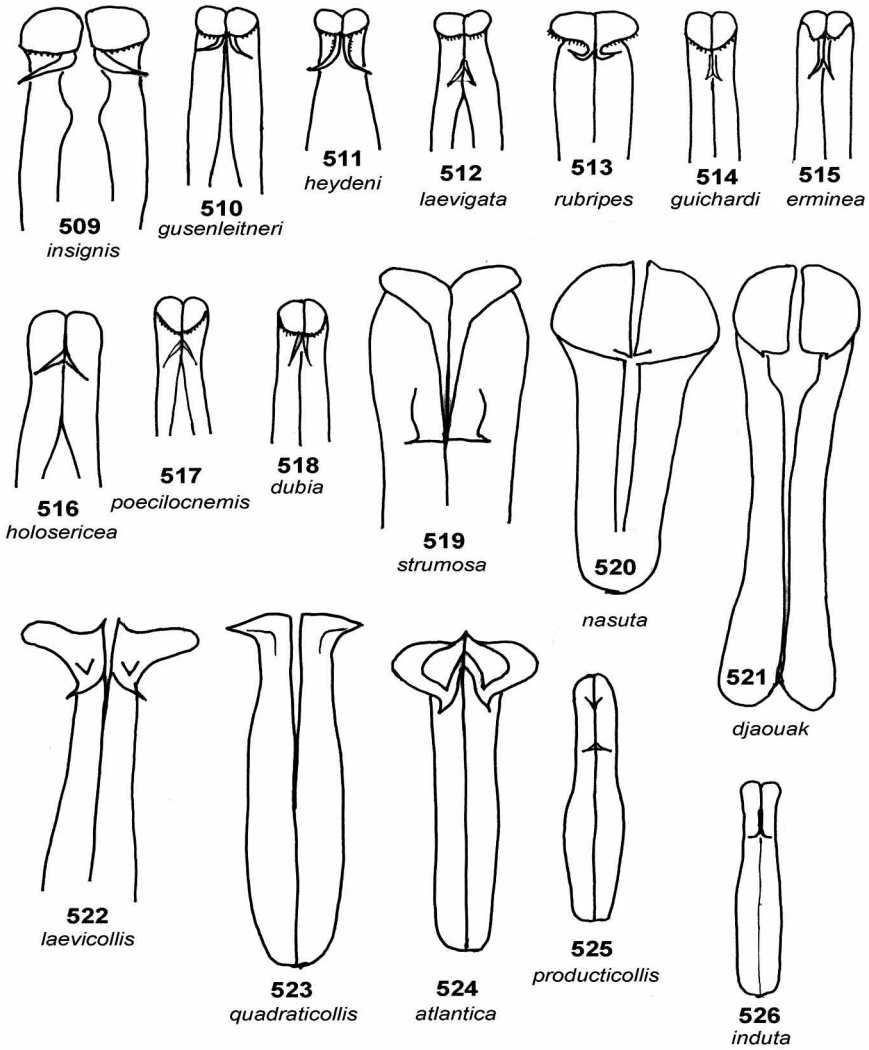
**penis valves lateral**



Figs 491-508: male genitalia: penis valve in lateral view.

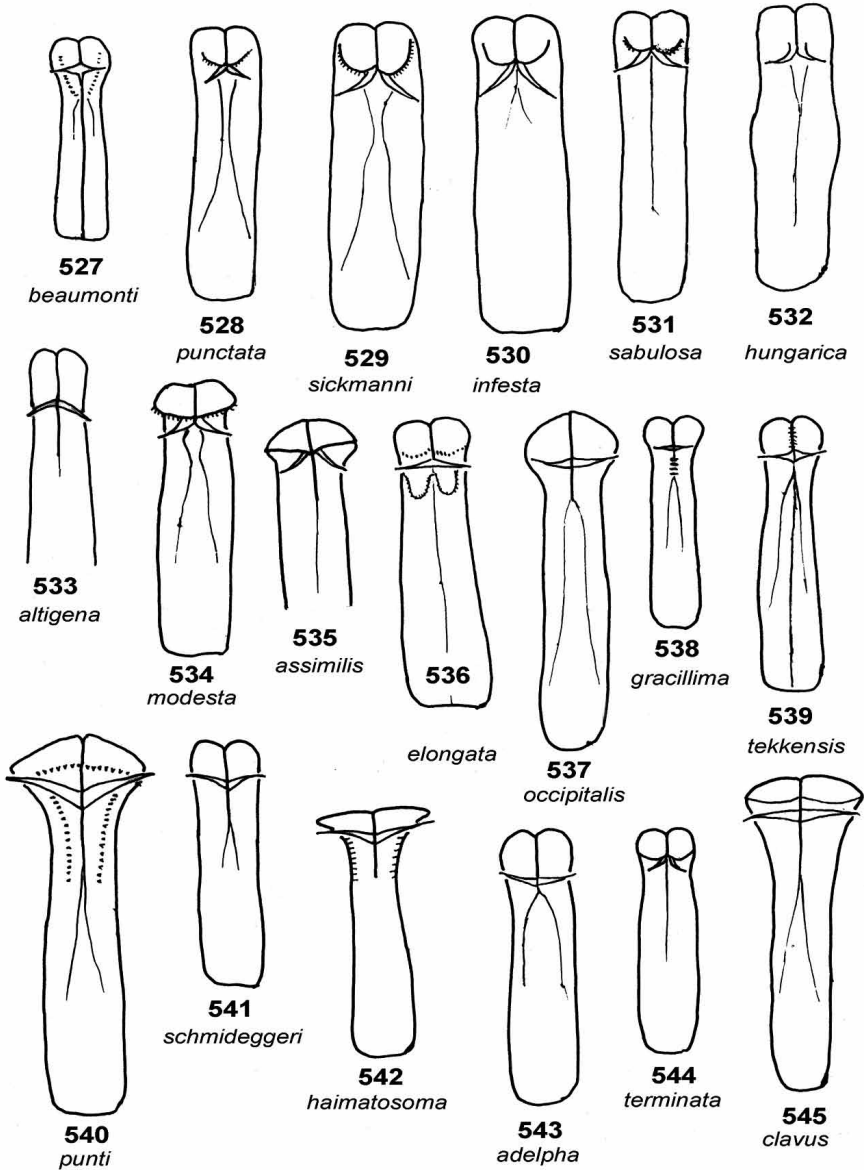


**penis valves ventral**



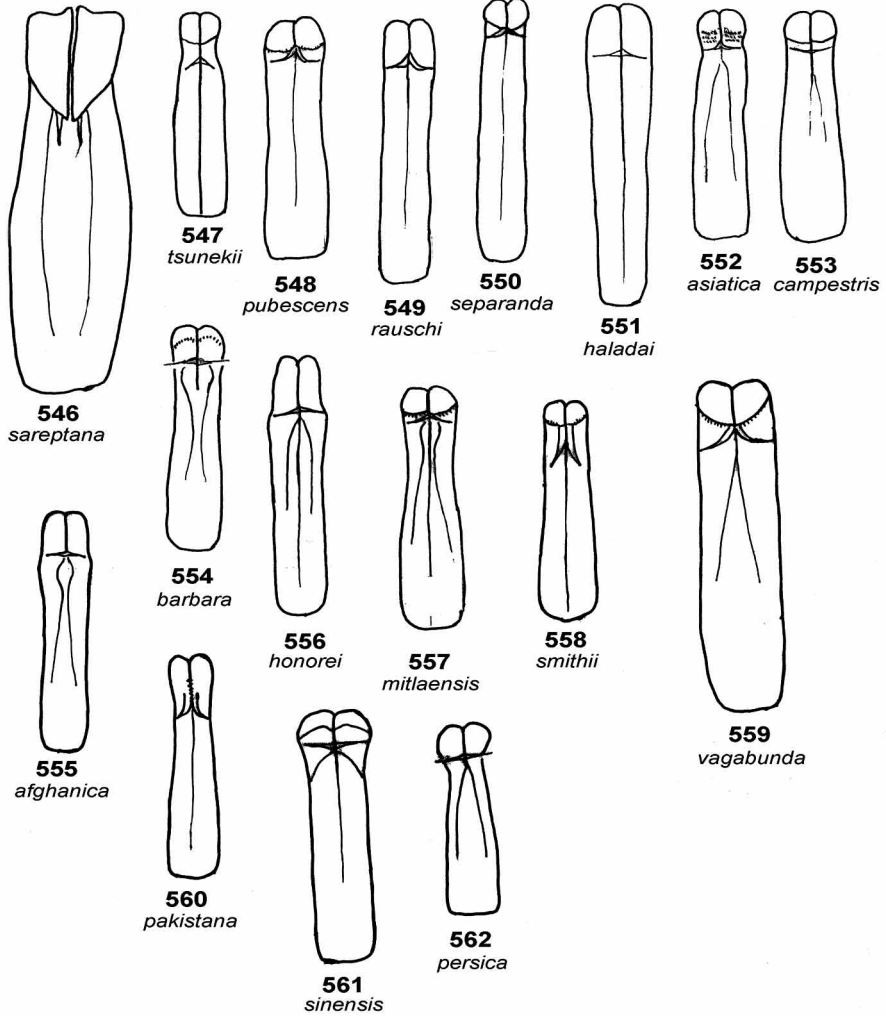
Figs 509-526: male genitalia: penis valve in ventral view.

penis valves ventral



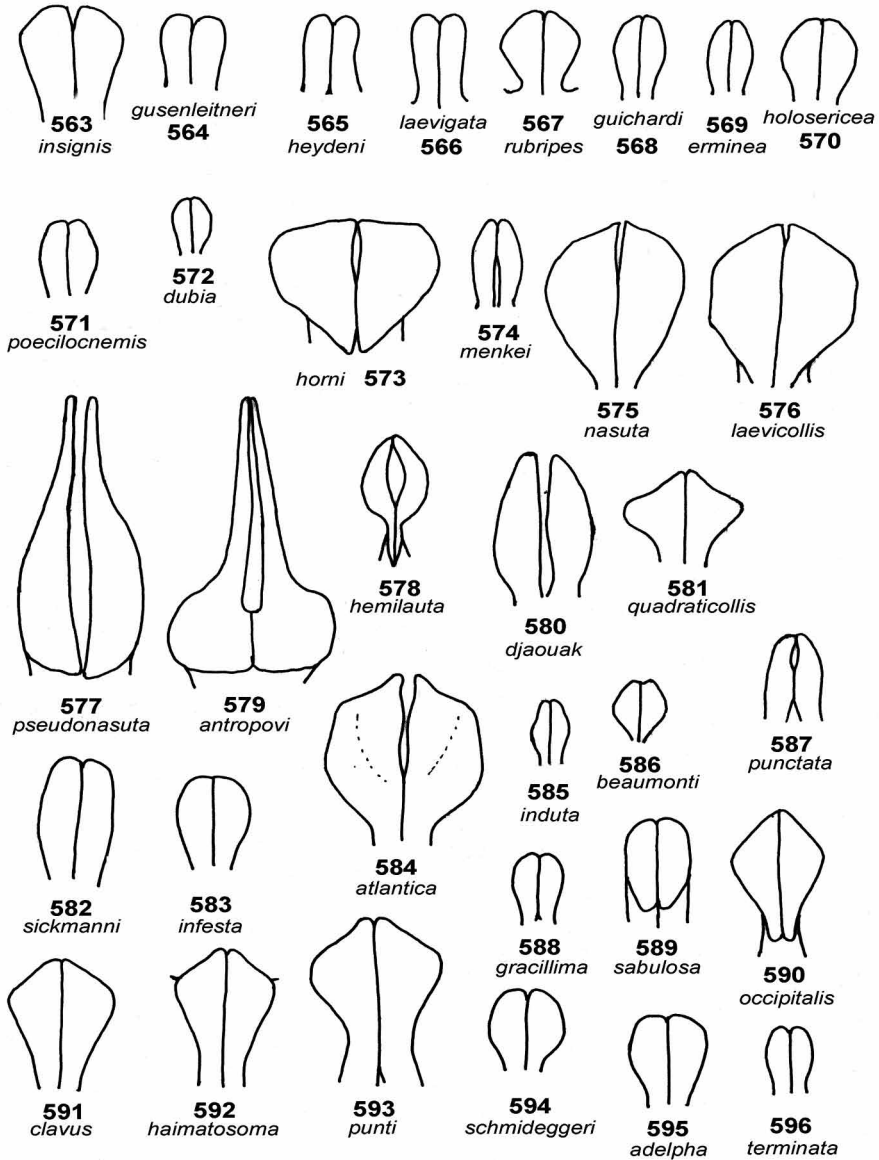
Figs 527-545: male genitalia: penis valve in ventral view.

**penis valves ventral**



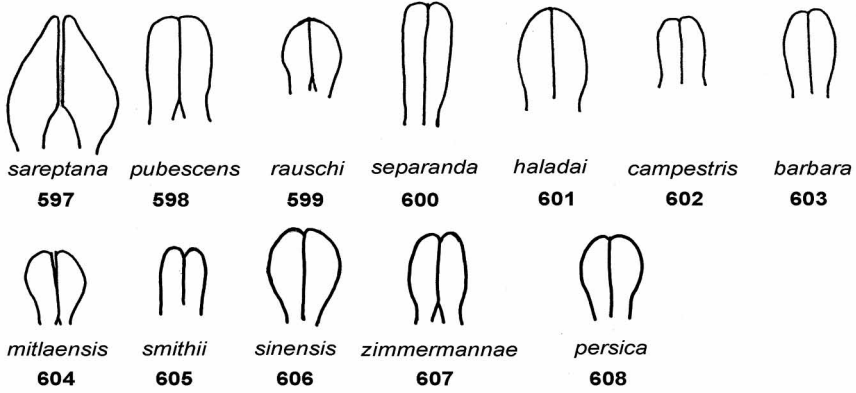
Figs 546-562: male genitalia: penis valve in ventral view.

### penis valves apical

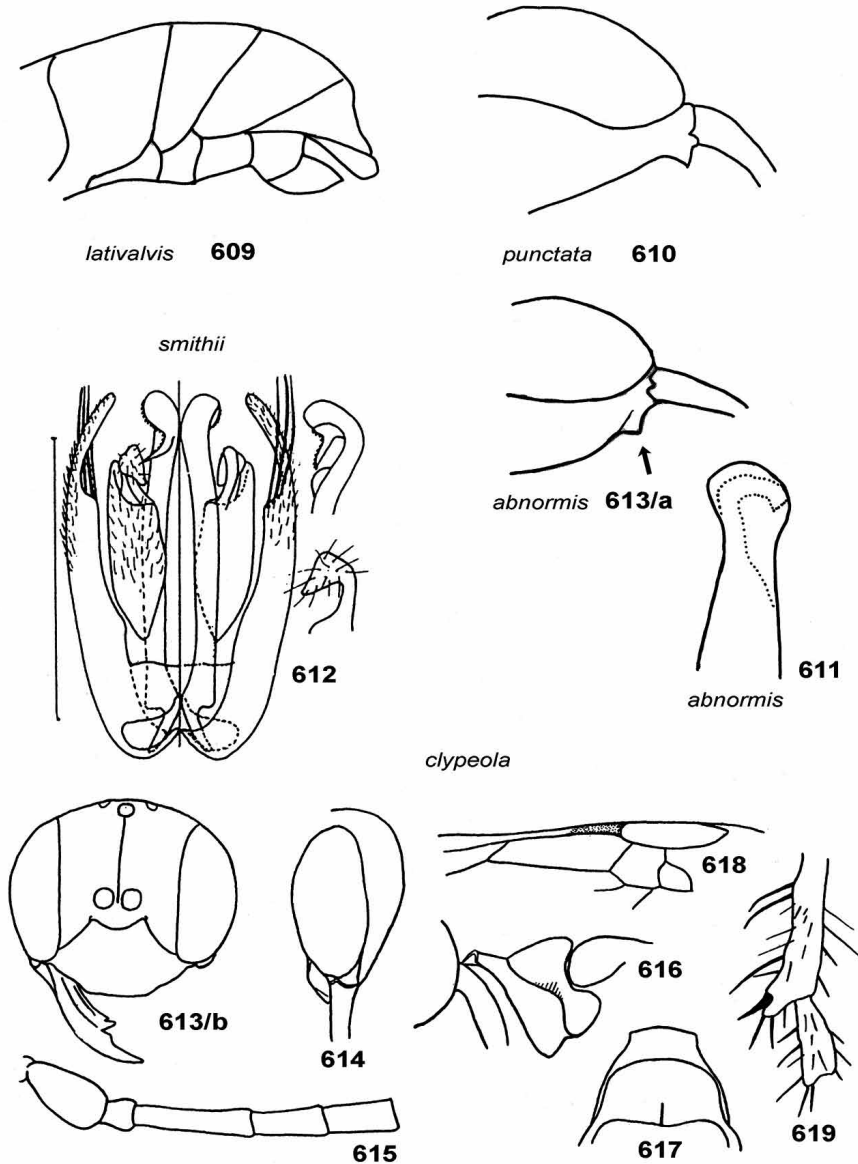


Figs 563-596: male genitalia: penis valve in apical view.

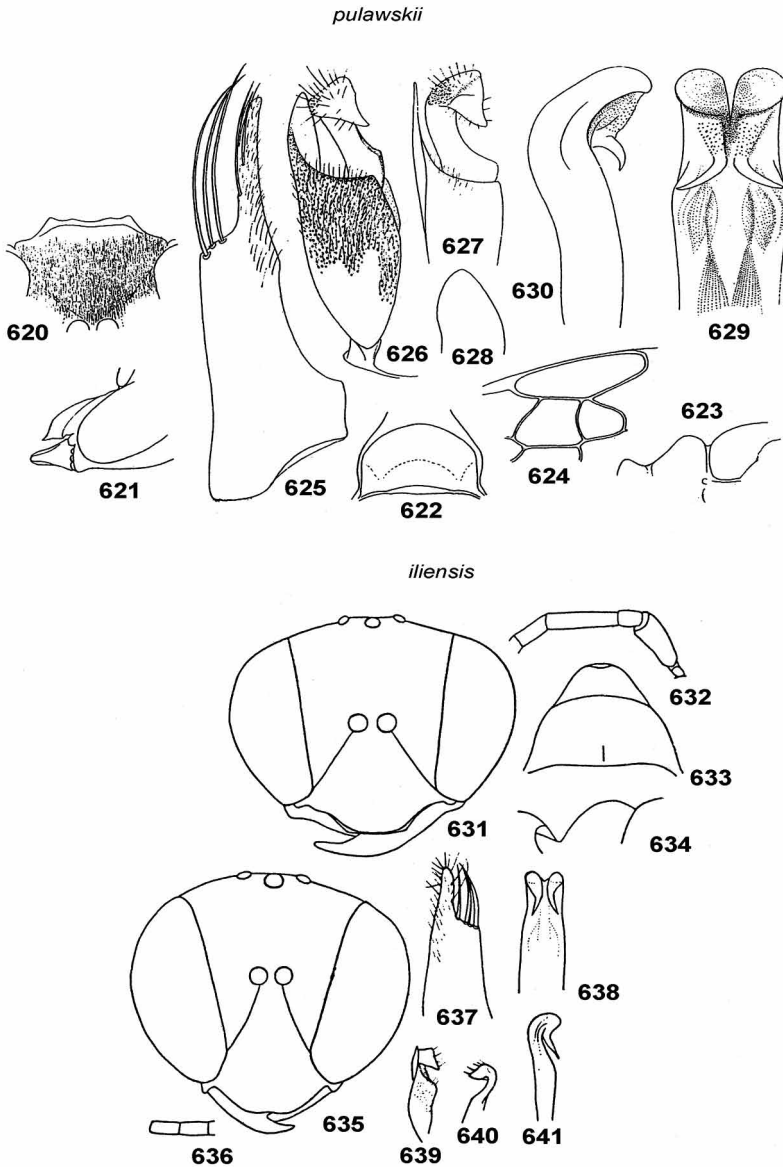
**penis valves apical**



**Figs 597-608:** male genitalia: penis valve in apical view.

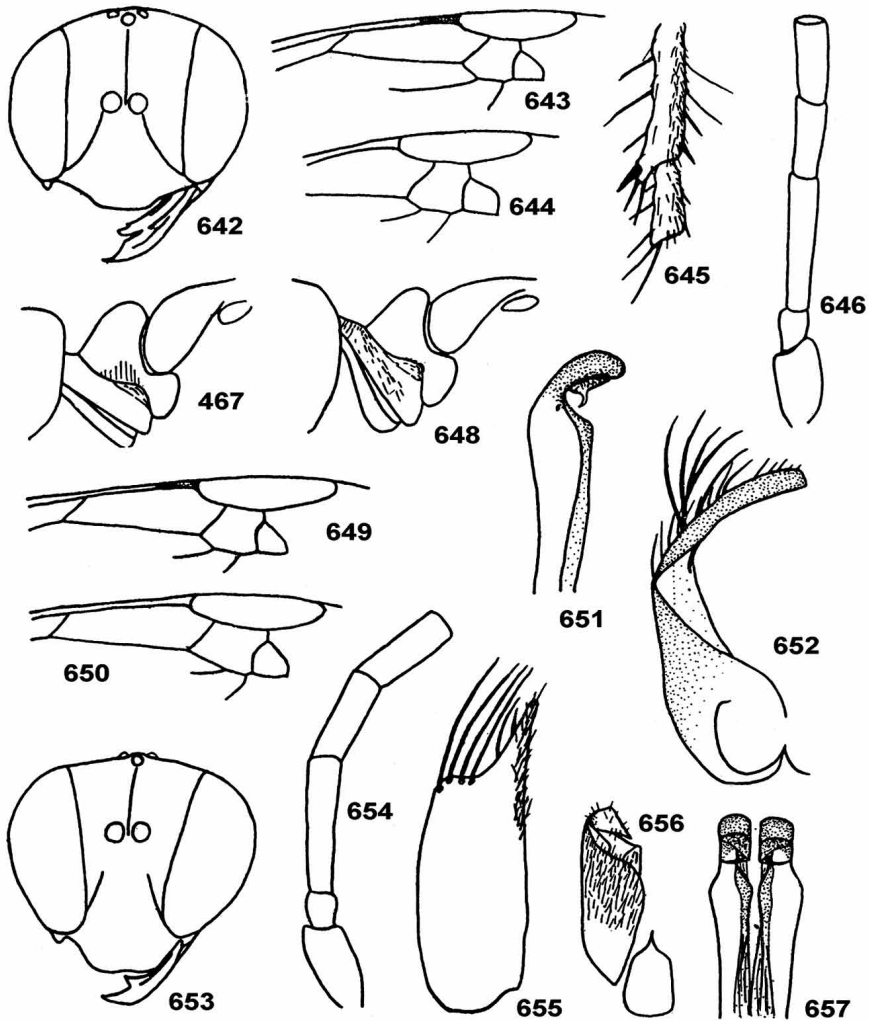


**Figs 609-619:** (609) *A. lativalvis*: gaster apex in lateral view; (610) *A. punctata*: hypostomal carina in lateral view; (611) *A. abnormis*: male genitalia: cuspis in lateral view; (612) *A. smithii*: male genitalia (JHA & FAROOQI 1994: 8); (613/a) *A. abnormis*: hypostomal carina in lateral view; (613/b-619) *A. clypeola*: (613/b) head in frontal view, (614) head in lateral view, (615) flagellomeres, (616) pronotal collar laterally, (617) pronotal collar dorsally, (618) forewing, (619) foretarsomeres I-II (YANG & LI 1990: 262).

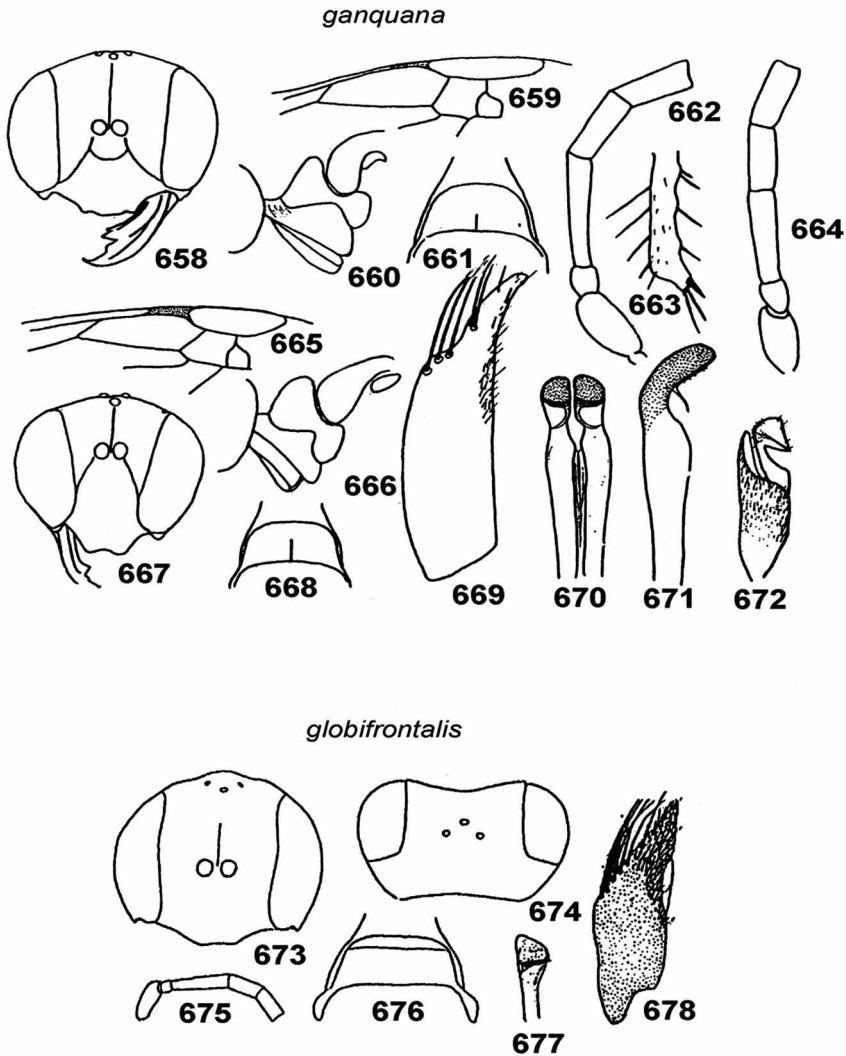


**Figs 620-641:** (620-630) *A. pulawskii*: male: (620) clypeus in frontal view, (621) clypeus in lateral view, (622) pronotal collar in dorsal view, (623) pronotal collar in lateral view, (624) submarginal cells, (625) gonostyle in lateral view, (626) volsella in ventral view, (627) volsella in oblique ventral view, (628) cuspis of volsella, (629) penis valve in ventral view, (630) penis valve in lateral view (TSUNEKI 1971: 175); *A. iliensis*: (631) female head in frontal view, (632) female flagellomeres, (633) pronotal collar of female in dorsal view, (634) pronotal collar of female in lateral view, (635) male head in frontal view, (636) apex of flagellum, (637) gonostyle in lateral view, (638) penis valve in ventral view, (639) volsella, (640) cuspis of volsella, (641) penis valve in lateral view (KAZENAS 1978: 662).

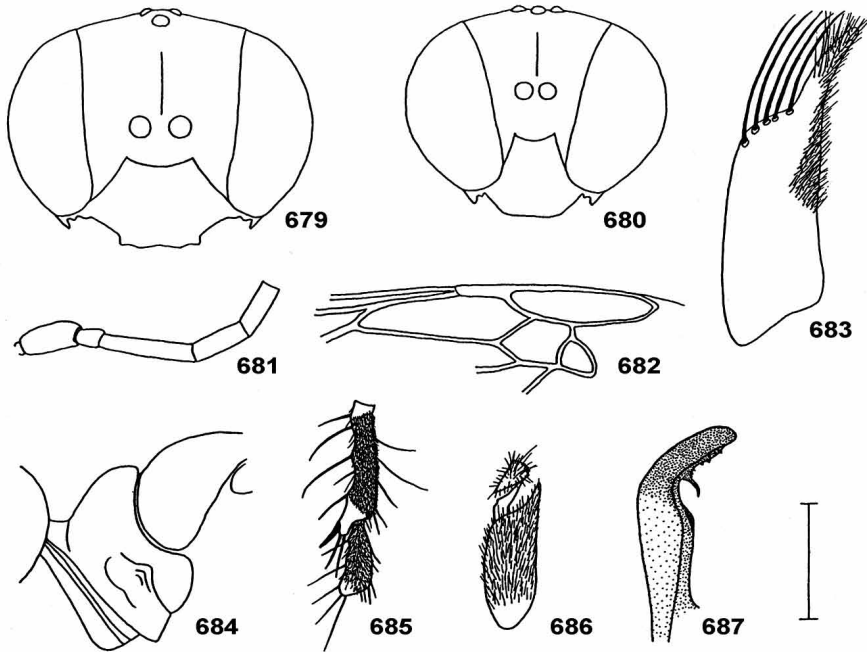
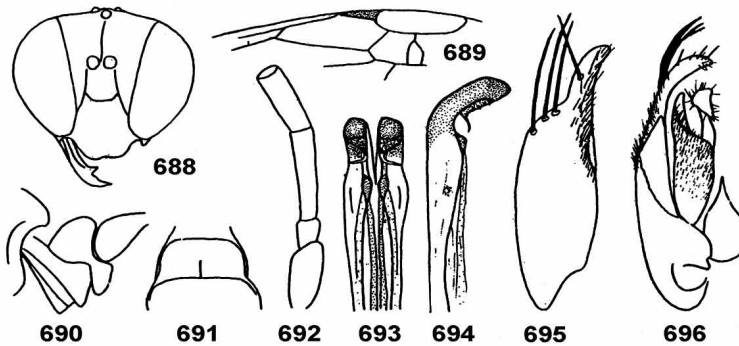


*borealis*

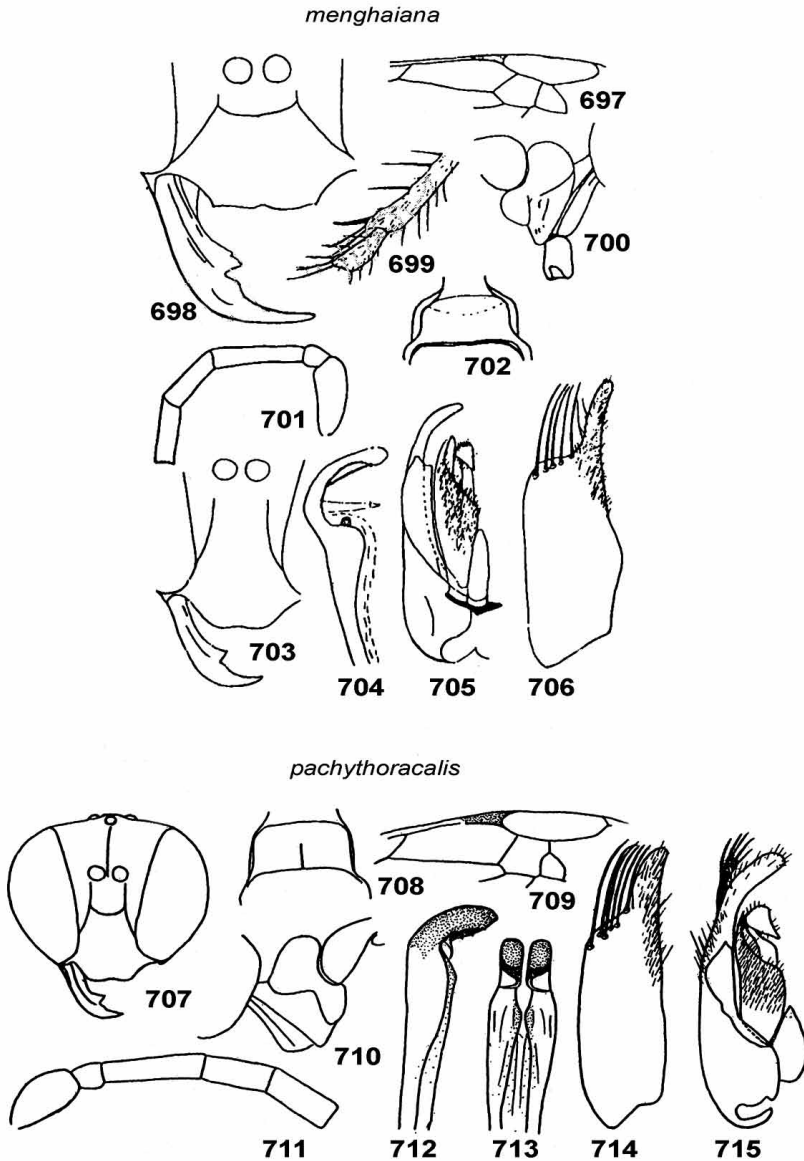
Figs 642-657: *A. borealis*: (642) female head in frontal view, (643, 644) submarginal cells of female, (645) female foretarsomeres I-II, (646) female flagellum, (647) pronotal collar of male in lateral view, (648) pronotal collar of female in lateral view, (649, 650) submarginal cells of male, (651) penis valve in lateral view, (652) gonostyle in ventral view, (653) male head in frontal view, (654) male flagellum, (655) gonostyle in lateral view, (656) volsella, (657) penis valve in ventral view (LI & YANG 1990: 264).



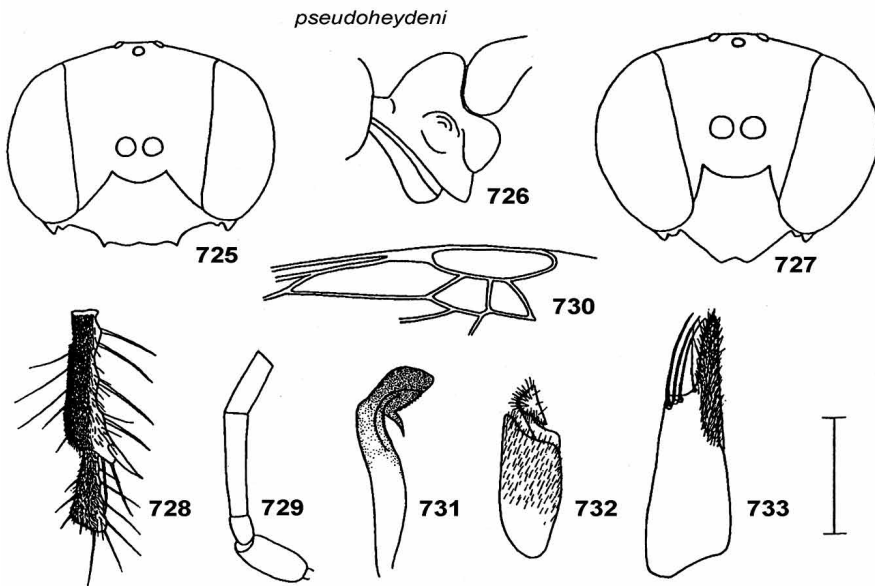
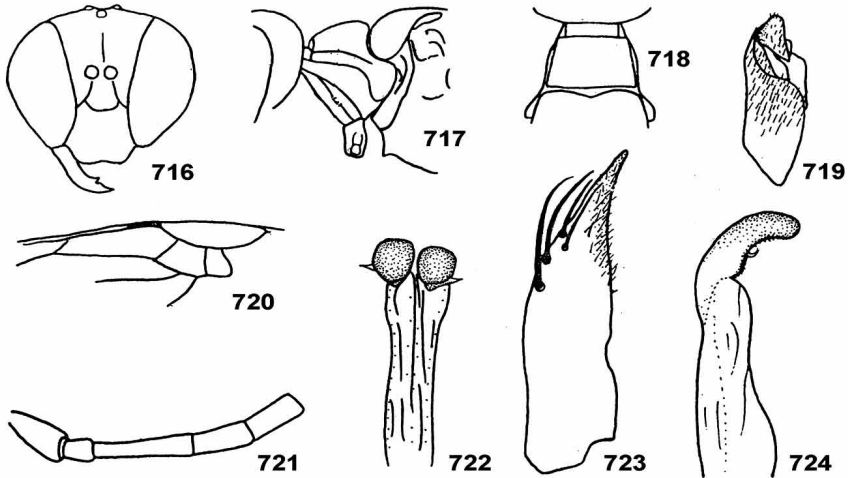
**Figs 658-678:** (658-672) *A. ganquana*: (658) female head in frontal view, (659) submarginal cells of female, (660) pronotal collar of female in lateral view, (661) pronotal collar of female in dorsal view, (662) female flagellum, (663) female foretarsomere I, (664) male flagellum, (665) submarginal cells of male, (666) pronotal collar of female in lateral view, (667) male head in frontal view, (668) pronotal collar of male in dorsal view, (669) gonostyle in lateral view, (670) penis valve in ventral view, (671) penis valve in lateral view, (672) volsella (YANG & LI 1989: 106); *A. globifrontalis*: (673) female head in frontal view, (674) female head in dorsal view, (675) female flagellum, (676) pronotal collar of female in dorsal view, (677) penis valve in ventral view, (678) gonostyle in lateral view (LI & YANG 1995: 574).

*heteroclypeola**obliquetriolae*

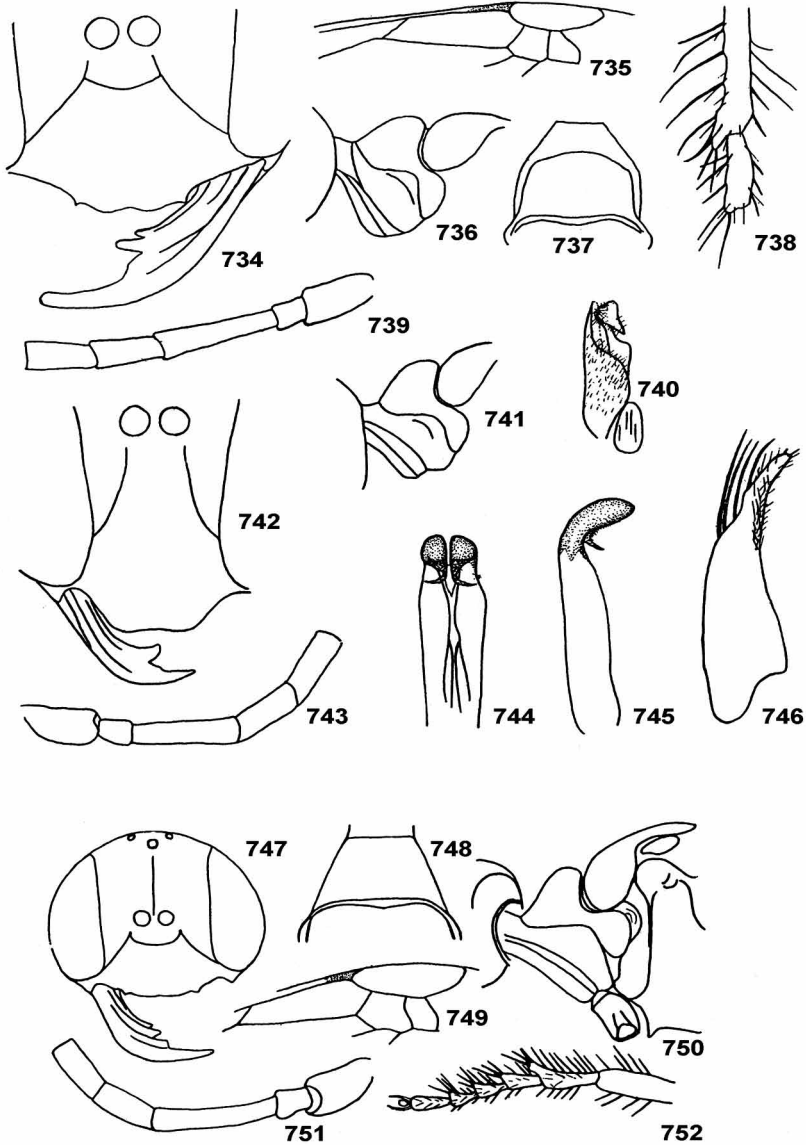
**Figs 679-696:** (679-687) *A. heteroclypeola*: (679) female head in frontal view, (680) male head in frontal view, (681) female flagellum, (682) submarginal cells of female, (683) gonostyle in lateral view, (684) pronotal collare of female in lateral view, (685) female foretarsomeres I-II, (686) volsella in ventral view, (687) penis valve in lateral view (LI & XUE 1998: 182); (688-696) *A. obliquetriolae* male: (688) head in frontal view, (689) submarginal cells, (690) pronotal collar in dorsal view, (691) pronotal collar in dorsal view, (692) flagellum, (693) penis valve in ventral view, (694) penis valve in lateral view, (695) gonostyle in lateral view, (696) genitalia in ventral view (YANG & LI 1989: 107).



**Figs 697-715:** (697-706) *A. menghaiana*: (697) submarginal cells of female, (698) clypeus and mandible of female, (699) foretarsomere I-II of female, (700) prothorax of female in lateral view, (701) female flagellum, (702) pronotal collar of female in dorsal view, (703) clypeus and mandible of male, (704) penis valve in lateral view, (705) genitalia in ventral view, (706) gonostyle in lateral view (LI & YANG 1989: 35); (707-715) *A. pachythoracalis* male: (707) head in frontal view, (708) pronotal lobe in dorsal view, (709) submarginal cells, (710) prothorax in lateral view, (711) flagellum, (712) penis valve in lateral view, (713) penis valve in ventral view, (714) gonostyle in lateral view, (715) genitalia in ventral view (YANG & LI 1989: 108).

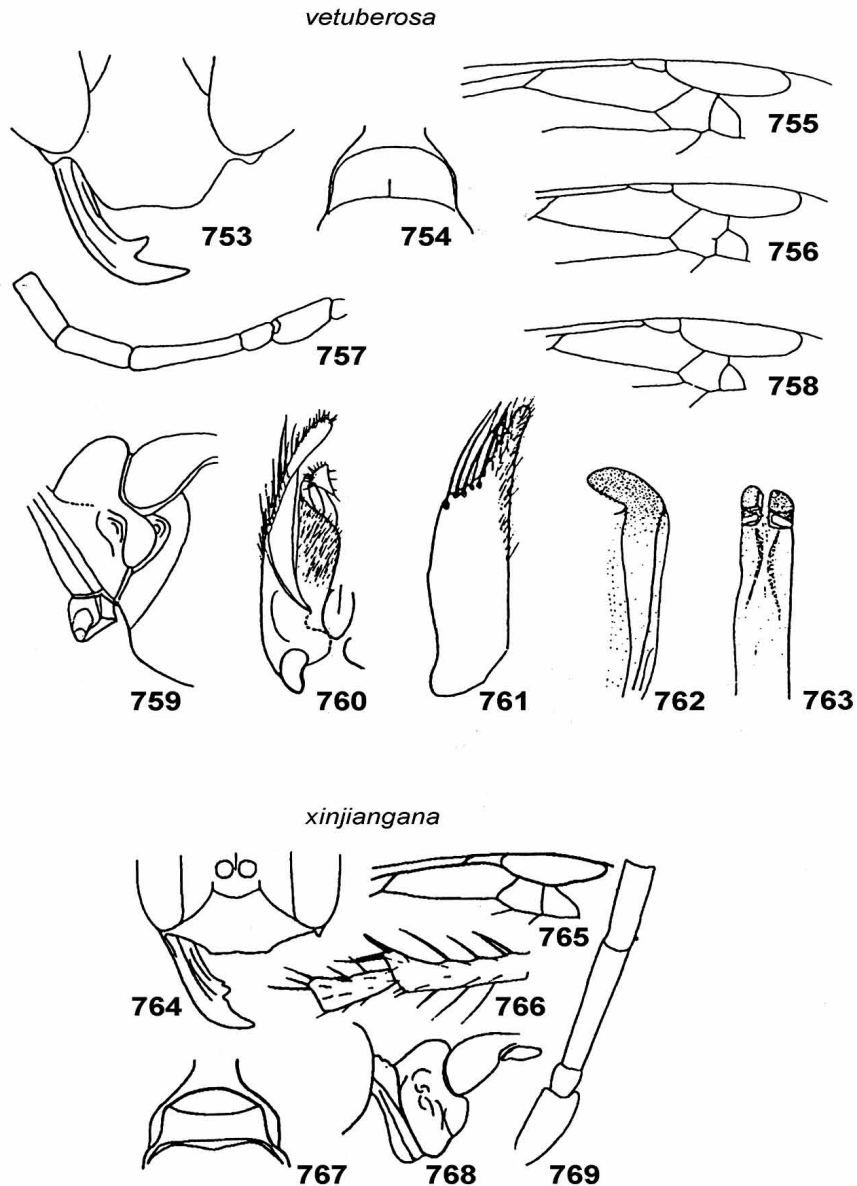
*planicollaris* = *sinensis*

**Figs 716-733:** (716-724) *A. planicollaris* = *A. sinensis* male: (716) head in frontal view, (717) prothorax in lateral view, (718) pronotal collar in dorsal view, (719) volsella, (720) submarginal cells, (721) flagellum, (722) penis valve in ventral view, (723) gonostyle in lateral view, (724) penis valve in lateral view (LI & YANG 1990: 260); (725-733) *A. pseudoheydeni*: (725) female head in frontal view, (726) prothorax in lateral view, (727) male head in frontal view, (728) flagellomeres I-II of female, (729) flagellum of female, (730) submarginal cells of female, (731) penis valve in lateral view, (732) volsella, (733) gonostyle in lateral view (LI & HE 2000: 338).



**Figs 734-752:** (734-746) *A. rubigena*: (734) clypeus and mandible of female, (735) submarginal cells female, (736) prothorax lateral view of female, (737) pronotal collare in dorsal view, (738) female foretarsomeres I-II, (739) female flagellum, (740) volsella, (741) prothorax of male in lateral view, (742) clypeus and mandible of male, (743) male flagellum, (744) penis valve in ventral view, (745) penis valve in lateral view, (746) gonostyle in lateral view (LI & YANG 1990: 261); (747-752) *A. untumoris* female: (747) head in frontal view, (748) pronotal collar in dorsal view, (749) submarginal cells, (750) prothorax in lateral view, (751) flagellum, (752) foretarsus (YANG & LI 1989: 109).





**Figs 753-769:** (753-763) *A. vetuberosa* male: (753) clypeus and mandible, (754) pronotal collar in dorsal view, (755, 756, 758) submarginal cells, (757) flagellum, (759) prothorax in lateral view, (760) genitalia in ventral view, (761) gonostyle in lateral view, (762) penis valve in lateral view, (763) penis valve in ventral view (LI & LI & YANG 1994: 291); (764-769) *A. xinjiangana* female: (764) clypeus and mandible, (765) submarginal cells, (766) foretarsomeres I-II, (767) pronotal collar in dorsal view, (768) prothorax in lateral view, (769) flagellum (LI & YANG 1989: 35).