

The Genera of the Ammophilini (Hymenoptera: Sphecidae)¹

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Abstract

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Six genera are recognized in the tribe Ammophilini: *Ammophila*, *Podalonia*, *Eremnophila*, *Eremochares*, *Hoplammophila* and *Parapsammophila*. A synonymical species checklist is given for the last three genera. A key to genera is provided which is based partially on characters heretofore unutilized.

The various generic names in the Ammophilini have received rather conservative treatment by most European authors who recognize one genus, *Ammophila*, with a number of subgenera. In North America the recognition of genera has been more liberal (Bohart and Menke 1963) because greater generic significance has been accorded the differences in biology and (or) structure found among the various taxa. Recently, several authors have published information which now makes it possible to strengthen some of the generic concepts proposed by Bohart and Menke, and also to improve upon their key to genera. In addition, thanks to the cooperation of many European colleagues, I have been able to study much more material of *Hoplammophila*, *Eremochares* and *Parapsammophila* than was available when the study of Bohart and Menke was made. These specimens have been of great help in clarifying the status of these generic categories.

Ammophila Kirby and *Podalonia* Spinola

The abdominal character recently described by Pulawski (1965) makes it simple to separate these two genera. In *Podalonia* the apex of the first apparent sternite (petiole) meets the base of the second sternite (Fig. 3), whereas in *Ammophila* there is a large membranous area between the two plates (Figs. 4-5). Pulawski neglected to point out, however, that some species of *Ammophila* have a weakly sclerotized false sternite in the membranous area between apparent sternites I and II (Fig. 4). The function of this plate is unknown, but it may serve as a ligament between the sternites, or simply as a protective shield. The condition of this plate, or its presence or absence may prove to be a useful species character in *Ammophila*.

A character that I have found useful in separating *Ammophila* and *Podalonia* is the position of the spiracle on tergite I. In *Podalonia* the spiracle is located before the apex of the first sternite (Fig. 1). In *Ammophila* the spiracle is situated at or beyond the apex of the first sternite (Figs. 2, 4-5).

Eremnophila Menke

When I described *Eremnophila* as a subgenus of *Ammophila* sensu stricto (Menke 1964), I erroneously considered that the groove which runs from the mesopleural scrobe to the ventral region was part of the preëpisternal sulcus.² Subsequent studies of ammophiline wasps from all parts of the world indicate that this groove is indeed found only in *Eremnophila* and that it is apparently not a part of the preëpisternal sulcus. Therefore I have coined the name "oblique sulcus" for this groove (Fig. 9). The oblique sulcus and the bizarre male genitalia (see Menke 1964) seem to me of sufficient distinctness to warrant recognition of *Eremnophila* as a genus.

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²Previously I used the term suture, but incorrectly because a suture is a line between two sclerites. The preëpisternal sulcus is clearly a secondary development of the mesopleuron.

***Hoplammophila* Beaumont**

It is now apparent that *Hoplammophila* should be recognized as a genus because of biological and structural considerations. The taxon was originally described by Beaumont (1960) as a subgenus of *Ammophila* sensu lato, and later was placed tentatively as a subgenus of *Parapsammophila* by Bohart and Menke. Typically, females of ground-nesting sphecine wasps have a well-developed tarsal rake on the front leg which is an adaptation for digging. Although the biology of *Parapsammophila* is as yet unknown, in all species that I have examined the female has a well-developed tarsal rake (Fig. 11) which implies that this genus nests in the ground. Tsuneki (1963) substantiated Iwata's (1938) report that *aemulans* Kohl, a member of *Hoplammophila*, nests in preëxisting cavities such as abandoned beetle burrows in wood, or hollow bamboo stems. Females of *aemulans* (and two other species of *Hoplammophila* seen by me) have no such rake (Fig. 12); this condition appears to be correlated with their nesting habits. The absence of a tarsal rake indicates that all four species currently assigned to *Hoplammophila* probably nest in preëxisting cavities.

Additional characters for separating *Hoplammophila* and *Parapsammophila* are found in the male. The clypeus is triangular in *Hoplammophila* and broadly rounded or truncate in *Parapsammophila*. The gonoforceps in *Hoplammophila* terminates in two processes but in *Parapsammophila* there is only one apical process. In light of these biological and structural differences I see no reason why *Hoplammophila* should not be considered a genus.

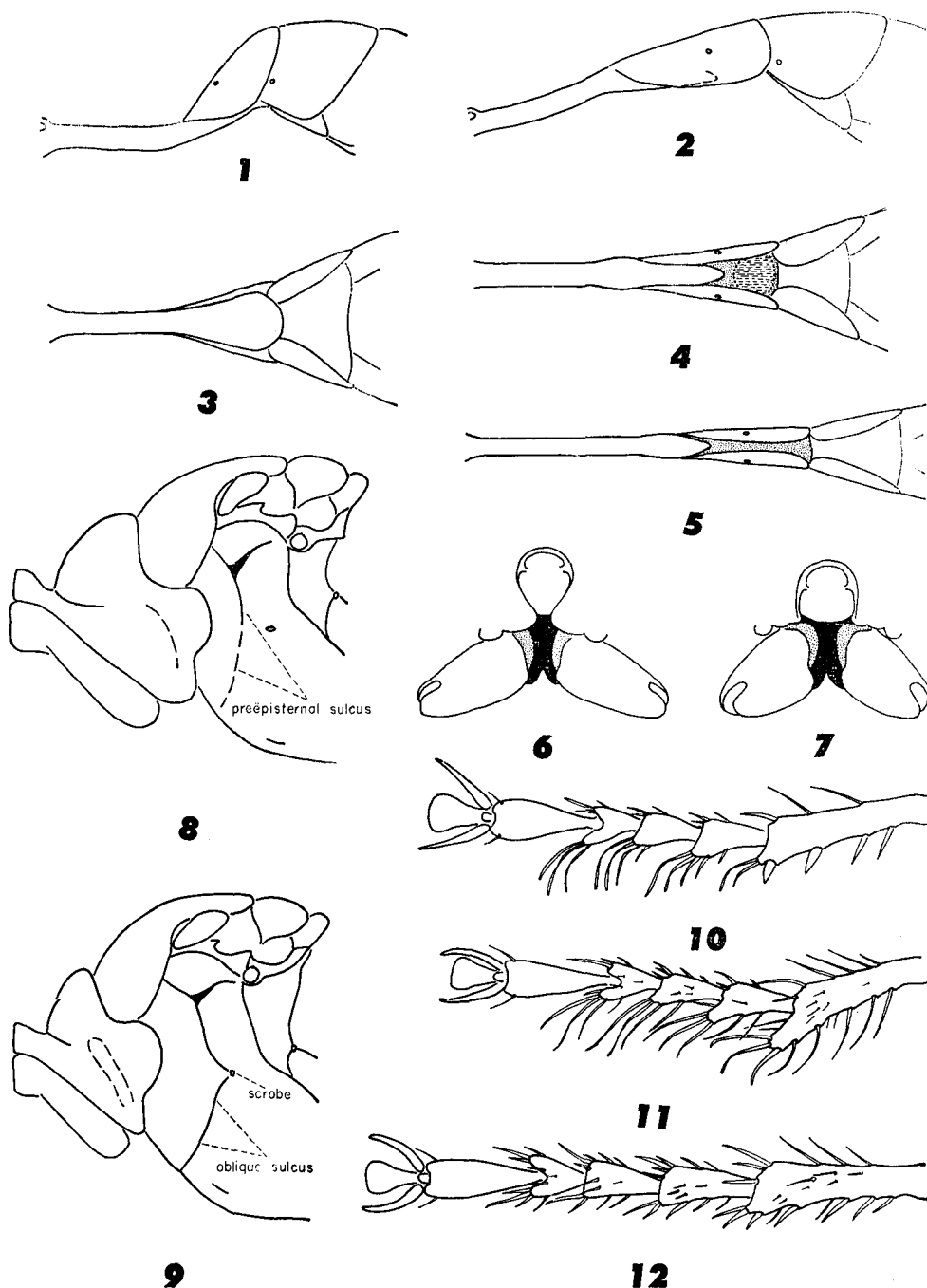
***Eremochares* Gribodo and *Parapsammophila* Taschenberg**

Bohart and Menke recognized *Eremochares* as a genus based upon the characters found in the type species *E. dives* (Brullé). However, we failed to point out the most striking feature of the genus, namely the configuration of the petiole socket. In the three *Eremochares* species I have studied (*dives*, *mirabilis* (Gussakovskij), *lutea* (Taschenberg)) the propodeal tergum nearly surrounds the petiole socket, there being only a slight gap at the mid-ventral line where the propodeal tergum meets the propodeal sternite (Fig. 6). In the genus *Parapsammophila* the petiole socket is bounded ventrally by the T-shaped propodeal sternite (Fig. 7).

Other distinctive features in *Eremochares* are the anteromedian projection on the mesosternum, the presence of a single spur at the apex of the mid-tibia, and the strongly converging inner orbits of the eyes of the female. Of these three characters only the last is always diagnostic for separating *Eremochares* from *Parapsammophila*. At least one *Parapsammophila* has a mesosternal projection (*foleyi* Beaumont) and several species have one of the mid-tibial spurs reduced or lacking. There appears to be a slight difference in the form of the female foretarsal rake in these two genera. In the three *Eremochares* species studied the bristles on tarsomere I are short and very stout (Fig. 10). In contrast the same bristles in *Parapsammophila* are elongate and blade-like (Fig. 11).

Names Currently Applied in *Hoplammophila*, *Eremochares* and *Parapsammophila*

To avoid possible confusion in the proper assignment of species to these three genera I have listed the species which belong in each genus. The most recent published synonymies have been followed, but names preceded by a question mark have been placed in synonymy only tentatively and their positions need confirmation. Each species name is cited as its original binomen.



Figs. 1-12. 1-2, Base of abdomen in lateral view of: 1, *Podalonia*; 2, *Ammophila*. 3-5, Base of abdomen in ventral view of: 3, *Podalonia*; 4-5, *Ammophila*. Stippled area in 4 and 5 represents membrane and the area indicated by dashed lines in 4 indicates the false sternite. 6-7, Posterior aspect of petiole socket and metacoxae of: 6, *Eremochares*; 7, *Parapsammophila*. Propodeal sternite indicated by solid black and membrane by stipple. 8-9, Anterior part of mesosoma in lateral view of: 8, *Ammophila*; 9, *Eremmophila*. 10-12, Left tarsus of female foreleg of: 10, *Eremochares*; 11, *Parapsammophila*; 12, *Hoplammophila*.

Names currently applied in *Hoplamphophila*
(synonym: *Micadophila* Tsuneki)

1. *Sphex armata* Illiger, 1807
2. *Ammophila clypeata* Mocsáry, 1883
3. *Ammophila aemulans* Kohl, 1901
4. *Ammophila anatolica* Beaumont, 1960

Names currently applied in *Eremochares*

1. *Ammophila dives* Brullé, 1833
synonyms: *Ammophila melanopus* Lucas, 1849
Ammophila festiva Smith, 1856
Ammophila elegans Smith, 1856
Ammophila limbata Kriechbaumer, 1869
Ammophila nigritaria Walker, 1871
Eremochares doriae Gribodo, 1882
Parapsammophila retowskii Konow, 1887
? *Ammophila orichalceomicans* Strand, 1915
2. *Parapsammophila lutea* Taschenberg, 1869
3. *Ammophila kohlii* Gussakovskij, 1928
(new name for *turanica* Kohl, 1907, nec Morawitz, 1890)
4. *Ammophila mirabilis* Gussakovskij, 1928
5. *Ammophila ferghanica* Gussakovskij, 1930

Names currently applied in *Parapsammophila*
(synonym: *Ceratosphex* Rohwer)

1. *Sphex erythrocephala* Fabricius, 1781
synonyms: *Ammophila fuscipennis* Smith, 1870
? *Ammophila violaceipennis* Cameron, 1889
2. *Ammophila cyanipennis* Lepeletier, 1845
synonyms: *Ammophila reticollis* Costa, 1864
Parapsammophila miles Taschenberg, 1869
3. *Ammophila ludovicus* Smith, 1856
4. *Parapsammophila lateritia* Taschenberg, 1869
synonym: *Parapsammophila monilicornis* Morice, 1900
5. *Ammophila ponderosa* Gerstaecker, 1870
synonym: ? *Ammophila gigantea* Kohl, 1901
6. *Parapsammophila turanica* Morawitz, 1890
(= *lutea* Kohl, 1907, and other authors (nec Taschenberg, 1869))
7. *Ammophila algira* Kohl, 1901
synonyms: *Psammophila gulussa* Morice, 1900
(female only *teste* Kohl, 1907)
? *Ammophila caelebs* Kohl, 1901
8. *Ammophila dolichostoma* Kohl, 1901
9. *Ammophila errabunda* Kohl, 1901
10. *Ammophila litigiosa* Kohl, 1901
11. *Ammophila unguicularis* Kohl, 1901
12. *Ammophila funeria* Nurse, 1903
13. *Ammophila eremophila* Turner, 1910
14. *Sphex testaceipes* Turner, 1918
15. *Sphex bakeri* Rohwer, 1921
16. *Sphex consobrinus* Arnold, 1928
17. *Sphex herero* Arnold, 1928
18. *Ammophila caspica* Gussakovskij, 1930

19. *Ammophila macularis* Gussakovskij, 1930
20. *Ammophila bituberculata* Bytinski-Salz, 1955
(originally proposed as an "ab" [erratum] or variety of *algira* but a valid species in my opinion)
21. *Ammophila sacra* Bytinski-Salz, 1955
22. *Ammophila foleyi* Beaumont, 1956
23. *Ammophila gibba* Alfieri, 1961

Key to the Genera of the Ammophilini

1. Claw without teeth along inner margin;* proboscis long, galea attaining middle of stipes when folded, and commonly reaching base of stipes ... 2
Claw with one or two subbasal teeth on inner margin; proboscis short, galea usually not attaining middle of stipes when folded, and often concealed by labrum 4
2. Mesopleuron with an oblique sulcus which ends dorsad at scrobe (Fig. 9); preëpisternal sulcus ending at scrobe *Eremmophila* Menke
Mesopleuron without an oblique sulcus, preëpisternal sulcus usually not curving to scrobe but directed ventrad, sometimes short, not reaching venter (Fig. 8) 3
3. Apex of first apparent abdominal sternite (first petiole "segment" or petiole sternite) not attaining second sternite (first gastral), the area between the two sternites membranous (Fig. 5) (membrane sometimes partially sclerotized, Fig. 4); spiracle of first apparent tergite (second petiole "segment" or petiole tergite) situated at or beyond apex of petiole sternite (Figs. 2, 4-5); petiole sternite often bent downward at point of tergite attachment *Ammophila* Kirby
Apex of first apparent sternite attaining and often overlapping base of second sternite, no membrane visible between the two (Fig. 3); spiracle of first tergite situated before apex of petiole sternite (Fig. 1); petiole often bent upwards at or near tergite attachment *Podalonia* Spinola
4. Petiole socket nearly completely surrounded by the propodeal tergum (Fig. 6); inner orbits of female strongly converging below; mesosternum with an anteromedian projection (behind front coxae); mid tibia with one apical spur *Eremochares* Gribodo
Petiole socket bounded ventrally by T-shaped propodeal sternite (Fig. 7); inner orbits of female parallel or nearly so; mesosternum usually without an anteromedian projection; mid-tibia usually with two apical spurs (one may be reduced or lacking) 5
5. Tarsal rake of female foreleg well developed, bristles on outer margin of tarsomeres long and blade-like, especially on II-IV (Fig. 11); free margin of male clypeus rounded or truncate, not acuminate
..... *Parapsammophila* Taschenberg
Tarsal rake of female foreleg weakly developed, bristles on either side of tarsus setiform, approximately equal in length and size (Fig. 12); free margin of male clypeus triangular in outline *Hoplammophila* Beaumont

Addendum

Since this manuscript was submitted for publication I have had the opportunity of examining the syntypes of *Parapsammophila lutea* Taschenberg. Most taxonomists have followed Kohl's (1907, p. 304) interpretation of this species, but

*A few species of *Podalonia* and *Ammophila* possess a minute tooth on the claw; the mouthpart characters are diagnostic in these exceptions.

my study of the syntypes indicates that Kohl misidentified *lutea* in spite of the fact that he had seen the types himself. The syntypes represent a species of *Eremochares* (as defined in this paper) related to, and perhaps conspecific with, *E. kohlii* Gussakovskij. The species Kohl interpreted as *lutea* is a *Parapsammophila* and most likely is conspecific with *turanica* Morawitz. This situation will be elucidated further in a paper now in preparation.

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