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New species of *Arpactophilus* from the island of New Caledonia (Hymenoptera, Sphecidae)

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Abstract. Seventeen new species of *Arpactophilus* from New Caledonia are described and figured. These are the first from New Caledonia and bring the number to 37 species of the genus from Australia and nearby islands, all east of Wallace's Line. The new species are *abdominalis, arboreus, brochus, caledonicus, concavus, cuspidis, dolichocara, gressitti, irwini, kraussi, nemoralis, nigripes. propodealis, schlingeri, scutellaris, sylvaticus,* and *webbi.* All of these have an occipital carina, sometimes most evident ventrally. As a rule there are 2 forewing submarginal cells, but in *caledonicus, dolichocara, nigripes,* and *propodealis* there is only one such cell.

Introduction

The genus *Arpactophilus* F. Smith now contains 37 species from areas of Australasia east of Wallace's Line. According to a recent paper by Menke (1989), he has seen undescribed species from New Guinea, New Britain, New Caledonia, the Solomon Islands, and Fiji. These add to the 12 described species from eastern Australia and one from Misoöl Island off the coast of western New Guinea (Irian). Menke, after describing 3 new species from Papua, New Guinea, the first of the genus from that area, estimated that in addition to perhaps 40 species in Australia many more will be found in its associated islands. Menke suggested a division of the tribe Stigmini into 2 subtribes Stigmina and Spilomenina in which the latter has 5-segmented maxillary palpi instead of 6 as stated in Bohart and Menke (1976). The genera of the subtribe Spilomenina are indicated nicely on one branch of the dendrogram in Fig. 37 of the aforementioned work: *Xysma. Spilomena, Microstigmus,* and *Arpactophilus.*

Menke also presented a detailed discussion of *Arpactophilus* and its relationship to *Spilomena.* He concluded that the 2 genera can be distinguished by the presence of an occipital carina (at least ventrally) in *Arpactophilus* (Fig. 39d) and its absence in *Spilomena.* Also, the frontal carina in *Arpactophilus* extends at least one-half the distance on the frons to the midocellus but less than one-half in *Spilomena.* Furthermore, hindwing vein cu-a in *Arpactophilus* is usually angled and appendiculate, but not so in *Spilomena.*

A collection of some 60 specimens of *Arpactophilus*, taken from Malaise traps in New Caledonia are the basis for the present paper. These represent about 17 species which can be roughly divided into 3 groups of different-sized specimens. The largest vary from 6 to 11 mm long. Most of these have the labrum exserted (Fig. 1) and multidentate. Also, the frons is usually coarsely, longitudinally striate (Fig. 24). Included are *schlingeri, irwini, webbi, concavus, cuspidis, gressitti,* and *brochus.* The second size group are 4 to 5 mm long. These have the frons punctate (Fig. 36), and the labrum not or hardly exserted. They are *abdominalis, arboreus, nemoralis,* and *sylvaticus.* The third size group are 3 to 4 mm long, and in most respects are similar to *Spilomena* from other areas of the world. The frons of these New Caledonia species is punctate, the clypeus may be mostly yellow (Figs, 41, 51), and legs are often all yellow. Although Bohart and Menke (1976) specified that there were 2 submarginal cells in the forewing of *Arpactophilus*, several of these small species have only one cell Figs. 46, 47, 48). These are *caledonicus, dolichocara, nigripes,* and *propodealis.* The 2-celled species of this third size group are *kraussi* and *scutellaris* (Figs. 38, 40). Since *Arpactophilus* usually die with the head thrust forward, the search for the occipital carina where it joins the median suture of the head venter (Fig. 39d) is not difficult. *Spilomena* have no occipital carina, and this genus is not known to occur on New Caledonia.

Acknowledgments

The material of larger specimens collected on New Caledonia was donated to the R.M. Bohart Museum by M.E. Irwin, E.I. Schlinger, and D.W. Webb. Type material of these species is deposited in Museum National d'Histoire Naturelle Entomologie, Paris, France (PARIS); and the R.M. Bohart Entomology Museum of the University of California,

Davis, California (DAVIS). The smaller specimens were borrowed from the Bishop Museum, Honolulu, (HONOLULU) and the holotypes are deposited there.

Abbreviations in key and descriptions: F-I etc.: flagellomeres (antennal segments) beyond pedicel; LID: least interocular distance; MOD: median ocellus diameter; T-I etc.: terga; S-I etc.: sterna.

Key to *Arpactophilus* of New Caledonia (based on females)

1. Labrum exserted and multidentate (Figs. 1, 15, 28), clypeus with apicolateral tooth (Figs.1, 15) 2
   Labrum not exserted, or only slightly so, clypeus various 6

2. Frons punctate but not obviously striate or reticulate (Fig. 15j; lower (longer) mandibular tooth longer than 1/2 LID (least interocular distance) (Fig. 15), labrum all yellow ..... *webbi* R. Bohart, new species
   Frons striate and reticulate (Fig. 11), lower mandibular tooth not longer than 1/2 LID, clypeus and labrum not all yellow 3

3. Clypeal apex broadly concave, no sharp apical point medially (Fig. 11), submarginal cell II subtriangular (Fig. 12) ..... *concavus* R. Bohart, new species
   Clypeal apex with sharp medial point apically (Fig. 1), submarginal cell II various 4

4. Submarginal cell II 2x as broad as high (Fig. 2), abdomen black and red ..... *schlingeri* R. Bohart, new species
   Submarginal cell II not 2x as broad as high (Fig. 7), abdomen black 5

5. Propodeal enclosure reticulate, submarginal cell II 2x as long posteriorly as anteriorly (Fig. 27) ..... *gressitti* R. Bohart, new species
   Propodeal enclosure with broad median area of transverse ridges (Fig. 8), submarginal cell II less than 2x as long posteriorly as anteriorly (Fig. 7) ..... *irwini* R. Bohart, new species

6. Frons with longitudinal striae or carinulae (Figs. 20, 24) 7
   Frons punctate only 8

7. Clypeus with a spinelike apicolateral tooth next to mandibular base (Fig. 20), teeth at apex of mandible subequal (Fig. 20), clypeal apex not truncate with sharp edges ..... *brochus* R. Bohart, new species
   Clypeus without lateral tooth, lower tooth at apex of mandible much stronger than upper tooth, clypeus truncate with sharp edges and stout but sharp median subapical tooth (Fig. 24) . .. . *cuspidis* R. Bohart, new species

8. Forewing with only one submarginal cell (Figs. 46, 47, 48) 9
   Forewing with 2 submarginal cells (Figs. 38, 40) 12

9. Midline of frons (MOD to clypeus) about 1.2x LID (Fig. 51) 10
   Midline of frons 1.5-1.8x LID (Figs. 44, 45) 11

10. Legs all yellow ..... *caledonicus* R. Bohart, new species
    Legs mostly black, especially hindleg ..... *nigripes* R. Bohart, new species

11. Clypeus mostly yellow, legs all yellow ..... *propodealis* R. Bohart, new species
    Clypeus black, legs (especially femora) partly brown. *dolichocara* R. Bohart, new species

12. Scutellum yellow, face mostly yellow (Fig. 41), pleuron and head venter yellow ..... *scutellaris* R. Bohart, new species
    Scutellum black, face mostly black (Fig. 37), pleuron and head venter black 13

13. Propodeal enclosure finely sculptured (Fig. 43), body length about 3 mm, clypeus mostly yellow ..... *kraussi* R. Bohart, new species
    Propodeal enclosure coarsely reticulate or striate (Fig. 30, 35), body length abut 4.5 mm, clypeus black 14

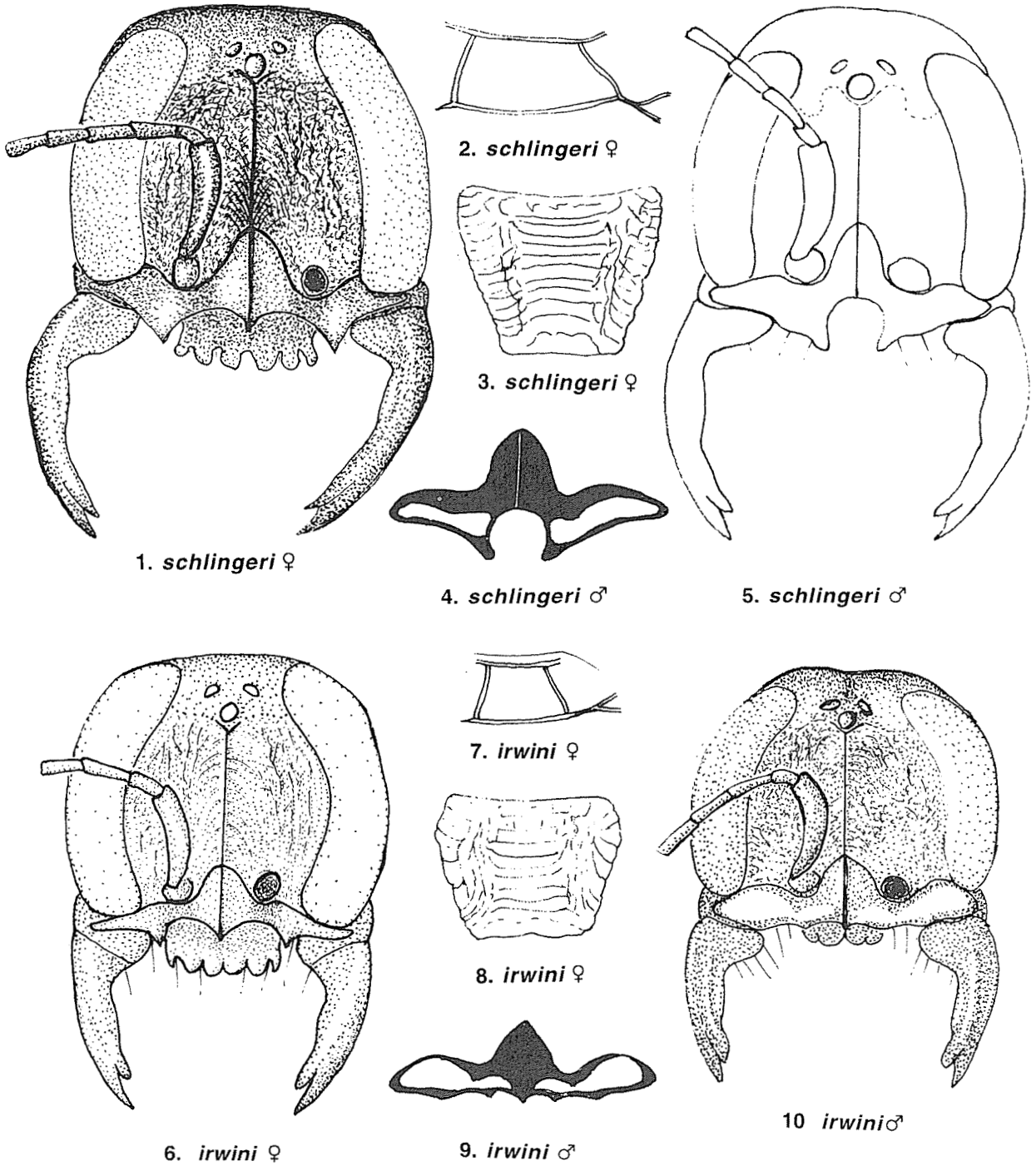
14. Abdomen red, face with conspicuous silvery, appressed microsetae ..... *abdominalis* R. Bohart, new species
    Abdomen black, appressed facial pubescence inconspicuous 15

15. Mandible mostly brown (Fig. 32) ..... *sylvaticus* R. Bohart, new species
    Mandible mostly yellow 16

16. F-I-II each at least 2x as long as broad (Fig. 29), flagellum black ..... *arboreus* R. Bohart, new species
    F-I-II each about 1.5x as long as broad (Fig. 33), flagellum fulvous in front ..... *nemoralis* R. Bohart, new species

Arpactophilus abdominalis R. Bohart new species

(Figs. 35, 36)



Figures 1-10. 1-5), *A. schlingeri*, x 25. 1) face; 2.) submarginal cell II of forewing; 3.) propodeal enclosure; 4.) clypeus; 5.) face; 6-10), *A. irwini*, x 25; 6.) face; 7.) submarginal cell II of forewing; 8.) propodeal enclosure; 9.) clypeus; 10.) face.

Description: Female holotype. Length 4.5 mm. Black, yellow and red; abdomen is red; yellow are: mandible mostly, scape in front, trochanters partly, femora apically, tibiae mostly; fulvous are: flagellomeres, tegula, tarsi; wings nearly clear; stigma light brown. Frons, clypeus with abundant silvery, appressed pubescence. Frons, mesonotum, mesopleuron with close, fine punctation; propodeum laterally with some fine carinulae, enclosure with coarse reticulae anteriorly (as in Fig. 35), finer ones among transverse carinae posteriorly; gena finely punctate, moderate punctures scattered, about 2 PD

apart; abdomen polished, practically epunctate. Face (Fig. 36), F-I to II each about 1.3x as long as broad; frontal carina complete, extended over clypeus; vertex behind eye about 6 MOD; 2 forewing submarginal cells (as in Fig. 34); no definable pygidial plate.

Holotype female (PARIS), Pindai Forest, New Caledonia, XI-23-92 (D.W. Webb, E. Schlinger).

Discussion: This medium-sized species (4.5 mm long) is characterized by its red abdomen and abundant silvery facial microsetae.

The specific name is a Latin adjective referring to the abdomen.

Arpactophilus arboreus R Bohart new species
(Figs. 29, 30)

Description: Female holotype. Length 5.5 mm. Black, marked with yellow and fulvous; yellow are: mandible mostly, scape in front, pronotal lobe partly, fore- and midfemora apically; fulvous are: tegula, legs mostly; wings highly stained. Frons, scutum, mesopleuron densely punctuate, propodeal side with some reticulae, propodeal enclosure reticulate in transverse pattern (Fig. 30); gena polished with scattered punctures; abdomen mostly polished, epunctate. Face (Fig. 29); F-I 2.3x as long as broad, II-III 2x; frontal carina strong, sharply raised on lower one-third of frons, continuing onto basal part of clypeus, ending in obtuse angle; distance from compound eye to occipital carina 2/3 as long as scape; wings lightly stained, 2 forewing submarginal cells (as in Fig. 31); no definable pygidial plate.

Holotype female (PARIS), Riviere Bleue Provincial Park, New Caledonia, XI-1992, acrose forest (M.E. Irwin, D.W. Webb).

Discussion: The black and relatively long F-I to III differentiates *arboreus* from the similarly sized *nemoralis* and *sylvaticus*. These 3 species have the frons punctate, frontal carina continued onto the clypeus where it is raised, and the propodeal enclosure reticulate.

The specific name is a Latin adjective meaning "of trees", referring to its capture in a forested area.

Arpactophilus brochus R. Bohart new species
(Figs. 20, 21, 22, 23)

Description: Female holotype. Length 6 mm. Black, brown, and yellow. Yellow are: scape in front, trochanters, femora toward apex, tibiae and tarsi mostly; brown are: legs partly, especially femora. Pubescence inconspicuous, appressed, silvery. Punctation of head and thorax mostly fine and close; abdomen mostly polished. Face (Fig. 20), clypeus apically flat between sharp subapical teeth; labrum slightly exserted, bidentate; frontal carina complete, raised between antennae, continued over clypeus; gena multridged on apical one-half, head venter (Fig. 21), with several transverse carinae in front of ventral part of occipital carina which expands laterally into a blunt tooth; F-I 3x as long as broad, II 1.9x; vertex behind compound eye nearly as long as scape; pronotal collar sharp, close to scutum; mesopleuron with many oblique microscopic striae; propodeal enclosure with many small reticules among oblique ridges (Fig. 23); wings nearly clear, 2 submarginal cells (Fig. 22), stigma black; S-II moderately expanded from base; T-VI with slightly flattened area, about 2x as long as broad, not a distinct plate.

Male. Unknown.

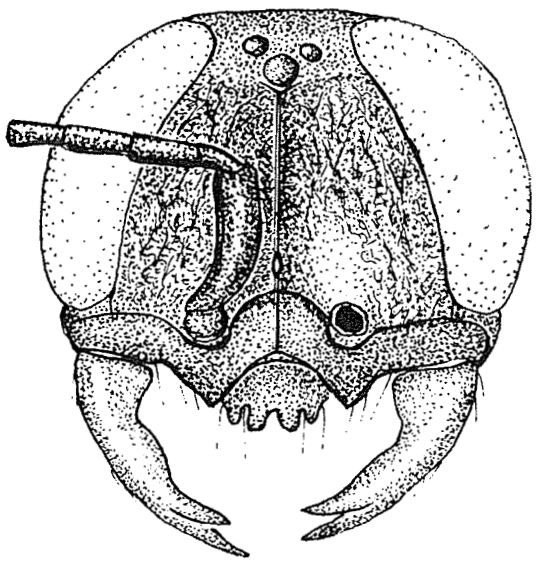
Holotype female (PARIS), 9.1 km nw. Sanamea, Prov. Sud, New Caledonia, 425 m, I-1596 (M.E. Irwin, D.W. Webb).

Discussion: This species appears to be related to *irwini* and *gressitti* because of the striate frons and the posterior clypeal margin with a sharp sublateral tooth. However, it differs from these species because the labrum is not prominently exserted. Also, *brochus* has a series of strong transverse carinae on the head venter (Fig. 21), whereas the others have at most a few short ones.

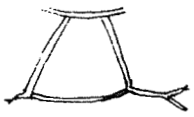
The specific name is a Latin adjective referring to the projecting sublateral tooth of the clypeus.

Arpactophilus caledonicus R. Bohart new species
(Figs. 47, 51)

Description: Female holotype. Length 3 mm. Black, marked with light yellow: mandible mostly, clypeus mostly, scape in front, pronotal lobe, tegula, legs entirely; flagellum fulvous; wings clear, stigma dark brown. Punctation generally fine, close on frons, scutum, gena, mesopleuron; slightly coarser on propodeal enclosure; abdomen polished, epunctate. F-I 1.2x as long as broad, II 2x; thorax 2x as long as high in lateral view, propodeal enclosure 1.3x as long as broad, frontal carina fine but complete, a little raised below, continued onto clypeus as a ridge; occipital carina fading dorsally; facial details (Fig. 51), head about as long as broad in front view, malar



11. *concavus* ♀



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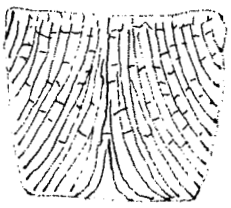
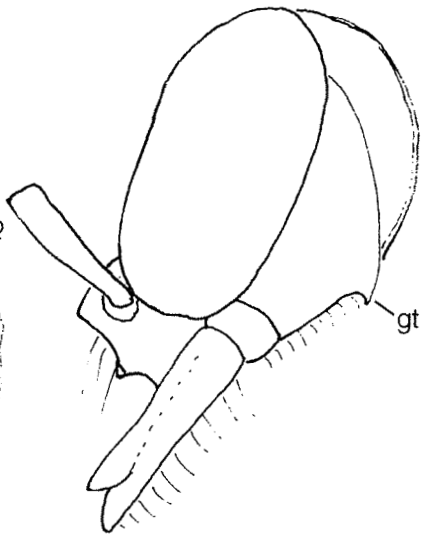
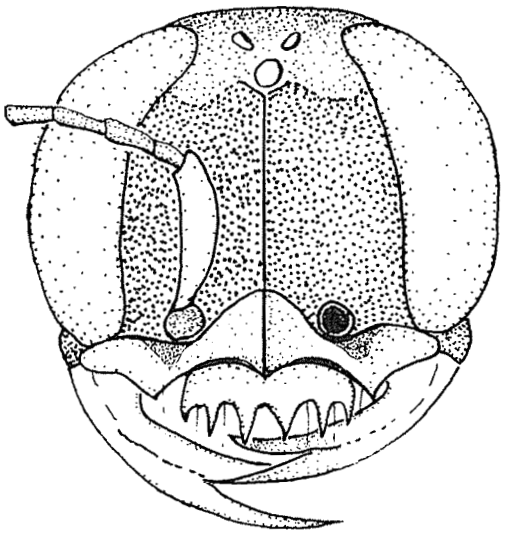


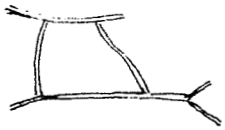
13. *concavus* ♀



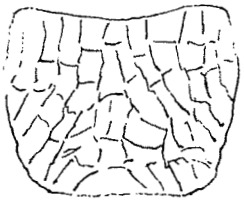
14. *concavus* ♀



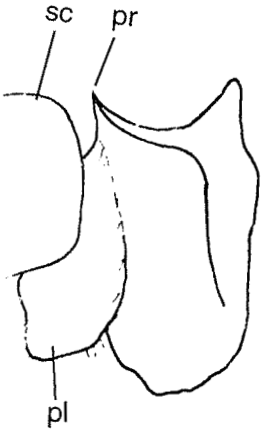
15. *webbi* ♀



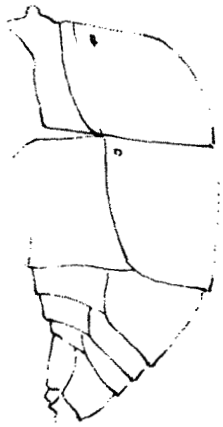
16. *webbi* ♀



17. *webbi* ♀



18 *webbi* ♀



19. *webbi* ♀

Figures 11-19. 11-15), *A. concavus,* x 25; 11) face; 12.) submarginal cell II of forewing; 13.) propodeal enclosure; 14.) head, lateral outline; gt, tooth at end of genal carina; 15-19), *A. webbi*; 15-17, x 37; 18, x 50; 19, x 25; 15.) face; 16.) submarginal cell II of forewing; 17.) propodeal enclosure; 18.) pronotum, lateral; so, scutum; pr, pronotal ridge; pl, pronotal lobe; Fig. 19, abdomen, lateral outline.

space quite short, 1 forewing submarginal cell (Fig. 47); no definable pygidial plate.

Male paratype. About as in female, yellow of clypeus extending across malar space, and broadly a short way up along inner orbit; frons fulvous.

Holotype female (HONOLULU), Koghis Mts., 400 m, New Caledonia, I-1969 (N.L.H. Krauss). Paratype male (HONOLULU), Col d'Amieu, 650 m, New Caledonia (J.L. Gressitt).

Discussion: Four species of *Arpactophilus* with only a single submarginal cell in the forewing are *caledonicus*, *nigripes*, *propodealis*, and *dolichocara*. They are all quite small (3 mm long), with a punctate propodeal enclosure, and occipital carina fading

dorsally. There is little pubescence, and S-II is not swollen basally. Also, the thorax is fully twice as long as high in lateral view. The species of this one-submarginal cell group differ mainly by details of head shape, clypeal markings, and leg coloration.

In *caledonicus* and *nigripes* the head is about as broad as long in front view, and the clypeus is marked with yellow transversely. However, the legs are all yellow in *caledonicus*, but mostly black in *nigripes*.

The specific name is Latin, meaning "of or from Caledonia".

Arpactophilus concavus R. Bohart new species

(Figs. 11-14)

Description: Female holotype. Length 10 mm. Black, wings light brown overall. Pubescence short, pale, appressed on clypeus, noticeable beneath head, on mesopleuron, on propodeal side, and on sternum II. Punctation fine, close on mesonotum, terga. Face (Fig. 11), frontal carina complete, continued over clypeus to emarginate apex; clypeus apicolaterally angulate; labrum exserted, 4lobed apically; mandible bidentate, apical teeth short, sharp; F-I 2.5x as long as broad, F-II-IV 2x; frons punctate, longitudinally rugulose, LID 0.75x scape length; occipital carina complete, genal carina present, ending in a sharp point (Fig. 14, gt); vertex behind eye 4 MOD; pronotum sharp-edged above, appressed to scutum; parapsides weak, short; scutum dull; prescutellar sulcus foveolate; omaulus and short sternaulus present; propodeal enclosure shiny, with many curved longitudinal carinulae (Fig. 13); forewing with 2 submarginal cells, II about as broad as high (Fig. 12); terga mostly polished, somewhat shagreened; S-II slightly depressed basally.

Male. Unknown.

Holotype female (PARIS), New Caledonia: Riviere Bleue Provincial Park, km 25.8 on Riviere Bleue Road (213 m.), XI-3-92, Malaise trap across forest path (M.E. Irwin, D.W. Webb).

Discussion: In some respects (black color, carinulate frons, stout mandibles) *concavus* resembles *irwini*. However, the anterior concavity of the clypeus (Fig. 1 1), and the genal carina which ends below in a sharp tooth (Fig. 14) are obvious distinguishing features. In the other species described herein from New Caledonia there is no genal carina.

The species name refers to the concave apical clypeal margin.

Arpactophilus cuspidis R. Bohart new species

(Figs. 24, 25, 26)

Description: Female holotype. Length 8 mm. Black, marked with yellow: mandible mostly, clypeus transversely (Fig. 24), scape in front, pronotal lobe, tegula partly, legs mostly except tarsi; fulvous are: tegula mostly, tinges on legs, tarsi entirely; wings lightly brown stained, stigma black. Pubescence on frons inconspicuous, appressed, golden. Vertex, scutum, scutellum finely, closely punctate; frons closely punctate between strong longitudinal ridges (Fig. 24); propodeal enclosure reticulate between diagonal ridging (Fig. 26); pleuron finely, closely punctate and with microscopic striation; gena with scattered punctures and anterior ridging. Facial proportions (Fig. 24); labrum hardly exserted, frontal carina complete, doubled between antennae, extended onto clypeus, ending subapically in sharp, stout erect tooth; F-I-II each 2x as long as broad, malar space as long as 2 MOD; vertex from compound eye to occipital carina as long as 2/3 scape; pronotal collar thin, sharp, closely appressed to scutum which has anterior depressed groove; forewing with 2 submarginal cells (Fig. 25); T-VI broadly flattened dorsally but not as distinct plate.

Male. Unknown.

Holotype female (PARIS), Mt. Khogis, 17 km nne. Noumea, New Caledonia, rainforest, 425 m, I-25-96 (M. Irwin, D. Webb, E. Schlinger).

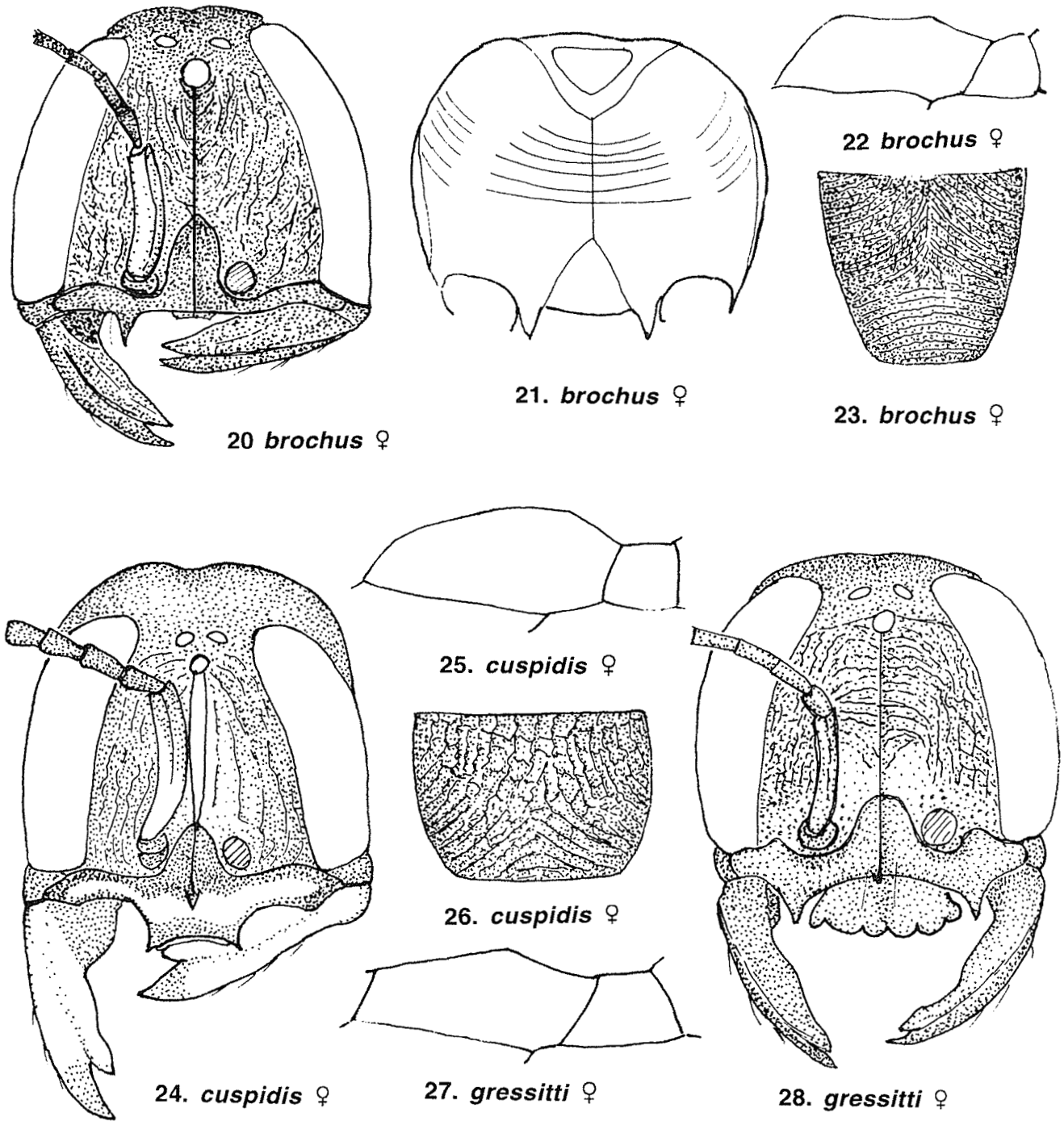
Discussion: The stoutly truncate clypeus with its sharply raised median tooth (best seen in lateral view), and transverse yellow markings, is distinctive. Also, the double frontal carina is unusual (Fig. 24).

The specific name is a Latin feminine noun in the genitive casen referring to the sharp median clypeal tooth.

Arpactophilus dolichocara R. Bohart new species

(Figs. 45, 46, 47)

Description: Female holotype. Length 3 mm. Black, marked with fulvous: mandible at base, scape in front, tegula, femora apically, tibiae mostly, tarsi; flagellum brown; wings clear, stigma brown. Punctation generally fine, close on frons, gena, scutum, propodeal enclosure, mesopleuron; abdomen polished, epunctate. F-I to III slightly longer



Figures 20-28. 20-23) *A. brochus*, x 35; 20.) face; 21) head, ventral (compare with Fig. 39); 22) submarginal cells II-III of forewing; 23) propodeal enclosure; 24-26), *A. cuspidis*, x 35; 24) face; 25) submarginal cells I-II of forewing; 26) propodeal enclosure; 27-28) *A. gressitti*, x 30; 27) submarginal cells I-II of forewing; 28) face.

than broad; thorax 2.2x as long as high in lateral view, propodeal enclosure 1.3x as long as broad (Fig. 49), frontal carina fine but complete, a little raised below, continued onto clypeus as a ridge; occipital carina fading dorsally; facial details (Fig. 45), head unusually long and narrow, vertex behind compound eye as long as scape, malar space quite short; 1 forewing submarginal cell (Fig. 46); no definable pygidial plate.

Male. Unknown.

Holotype female (HONOLULU), Anse Vata, New Caledonia, X-23-58 (C.R. Joyce). Paratype female (DAVIS), same data as holotype.

Discussion: The 2 species with elongate head are *dolichocara* and *propodealis*. Both have punctate frons and propodeal enclosure, and thorax twice as long as high in lateral view. In *dolichocara* the head in front view is about 1.5x as long as broad (Fig. 45). Adding to the length (as shown in the figure) is the vertex space, which is longer than the width of the ocellar triangle. In addition to the longer head, *dolichocara* differs from *propodealis* by having the clypeus black instead of mostly yellow. Also, the legs of *dolichocara* are less extensively yellow, more brown and fulvous.

The specific name is a Greek noun, meaning long head.

Arpactophilus gressitti R. Bohart new species
(Figs. 27, 28)

Description: Female holotype. Length 8 mm. Black, wings dark brown. Pubescence inconspicuous. Punctation fine, close, on vertex, clypeus, gena, scutum, scutellum; weak punctures scattered among shagreening on terminal terga. Face (Fig. 28), frontal carina complete, continued onto clypeus, ending in short point above exserted labrum which has 6 apical lobes; clypeus apicolaterally with sharp tooth; mandible bidentate, teeth short; F-I to IV each about 2x as long as broad; frons rugulose (Fig. 28), LID 0.75x scape length; vertex behind eye 6 MOD; occipital carina complete; prescutellar sulcus foveolate; omaulus and sternaulus present; propodeal enclosure reticulate, many curving carinulae; pronotum sharply edged, a series of short reticulae in front of scutum, parapsides present but shallow; forewing with 2 submarginal cells (Fig. 27), II a little broader than high; S-II swollen toward base; S-VI broadly flattened but without distinct plate.

Male. Unknown.

Holotype female (HONOLULU), w. of Ponerihauen, New Caledonia, VII-30-71 (J.L. Gressitt). Paratypes, 2 females (DAVIS), upper trail, Riviera Bleue Provincial Park, New Caledonia, 290 mm, XI-19-92 (D.W. Webb) and XII-27-91 (M.E. Irwin, D.W. Webb).

Discussion: In some respects *gressitti* is similar to *concavus*. They are about the same size and color. Both have the labrum exserted, frons rugulose, propodeal enclosure reticulate, and forewing venation alike. However, there are several important differences. In *gressitti* the clypeal carina is low and ends anteriorly in a small point. The labrum has 6 instead of 4 apical lobes, and there is no genal carina.

The specific name honors the collector of the holotype, J.L. Gressitt, my long-time friend and well known Coleopterist, who died in an airplane accident.

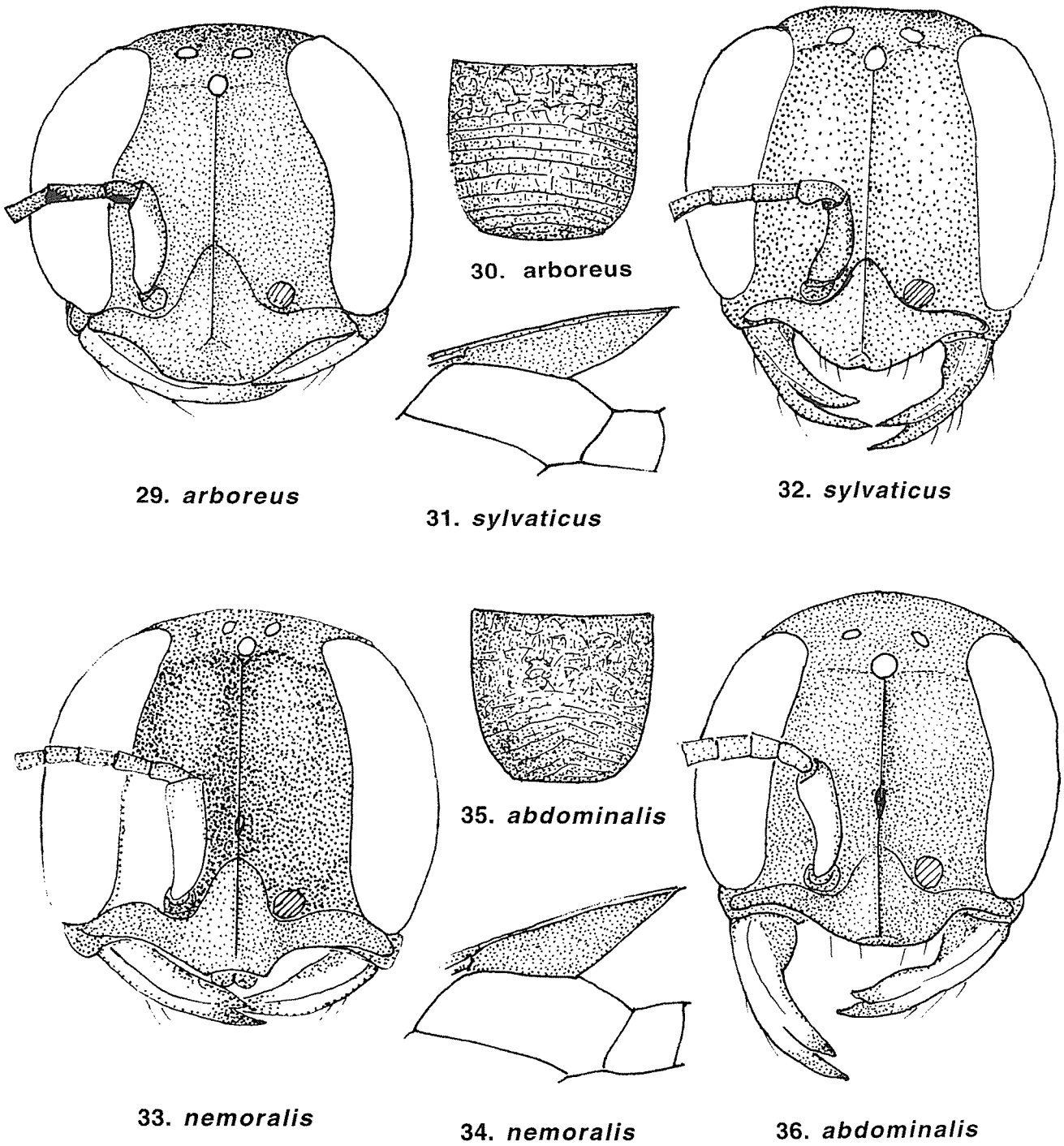
Arpactophilus irwini R. Bohart new species
(Figs. 6-10)

Description: Female holotype. Length 10 mm. Black, wings brown overall. Pubescence inconspicuous and short, pale on head and thorax, fulvous on abdomen. Punctation fine and indistinct on vertex, gena, and abdomen; fine on scutum and scutellum, quite fine and close on mesopleuron. Face (Fig. 6), frontal carina complete, continued over clypeus, ending in a sharp point above exserted labrum which has 6 teeth or lobes, outermost one smallest; clypeus also with sharp apicolateral tooth; mandible bidentate, teeth short; F-I to IV each about 2.1x as long as broad, following flagellomeres somewhat shorter; frons punctate, longitudinally rugulose, LID equal to scape length, occipital carina complete, flangelike laterally; vertex behind eye 5 MOD; pronotum sharp-edged, a series of short carinae in front of scutum; parapsides present, not deep; mesonotum dull; prescutellar sulcus foveolate; omaulus and weak sternaulus present, propodeal enclosure (Fig. 8) shiny, a median zone of cross carinae; forewing with 2 submarginal cells, II a little broader than high (Fig. 7); wings brown; terga mostly polished, T-IV-VI somewhat punctate; pygidial plate not defined, S-II abruptly swollen in lateral view (about as in Fig. 19).

Male paratypes. Length 9 mm. About as in female but face (Fig. 10). Clypeus with white markings (Fig 9), angles of anterior margin less pronounced; labrum less prominent, only 4 apical lobes.

Holotype female (PARIS), New Caledonia: Mt. Khogis (500 m.), 17 km nne. Noumea, XII-27-91, Malaise trap in forest (M.E. Irwin, D.W. Webb). Paratypes (DAVIS), 6 males, 1 female, same data as holotype; 5 females, New Caledonia: Riviere Bleue Provincial Park trail to Upper Riv. Bleue (250 m.), XI-5-92, Malaise trap (D.W. Webb); 1 female, Riviere Bleue Provincial Park, 30 km nw. Yaté (270 m.), XII-27-91, Malaise trap, (M.E. Irwin).

Discussion: This species is somewhat similar to the 3 species described and figured (female face) by Menke (1989). All the latter have a strongly pro-



Figures 29-36, females. 29-30) *A. arboreus*, x 40; 29) face; 30) propodeal enclosure; 31-32), *A. sylvaticus*, x 45; 31) forewing marginal cell, submarginal cells III; 32) face; 33-34), *A. nemoralis*, x 50; 33) face. 34) forewing marginal cell, submarginal cells I-II; 35-36), *A. abdominalis*, x 50; 35) propodeal enclosure; 36) face.

truding labrum and frontal carina that extends over the clypeus to end in a point above the labrum. Also, the frons is sculptured in various ways. However, the sculpture in Menke's species has a strong frontal "shield", which is absent in New Caledonian forms. Furthermore, the labrum of the New Guinea species is 4-lobed in *preposterus*, and 3-lobed in *rhinoceros* and *papua*. The 6-lobed labrum immediately distinguishes females of *irwini*, *schlingeri*, *gressitti*, and *webbi*. In turn these four are easily separated from each other because *webbi* has a

granular frons instead of an extensively carinulate one, *schlingeri* is the only one of the four to have red abdominal segments I-III, as well as a broad submarginal cell II (Fig. 27. The all black female, together with the much shorter submarginal cell II (Fig. 7), and the relatively stout mandibles characterize *irwini*. The only two larger species from New Caledonia with known males are *irwini* and *schlingeri*. The difference in markings (red basal abdominal segments in *schlingeri*) and the deeply emarginate clypeus of *schlingeri* (Figs. 4, 5) versus the short but entire one of *irwini* (Figs. 9, 10) make for an easy separation. In addition to the type series there are 4 females which are apparently the same as *irwini* but the wings are very lightly stained. They were collected on Mt. Mandjanie.

The specific name honors one of the collectors of the holotype, my friend, Mike Irwin.

Arpactophilus kraussi R. Bohart new species

(Figs. 37, 38, 39)

Description: Female holotype. Length 3 mm. Black, brown, and yellow. Brown are: flagellum, tegula, abdomen; yellow are: mandible, clypeus mostly, scape, pronotal lobe, legs entirely; wings clear, forewing stigma dark brown. Punctation generally fine and close; abdomen polished, epunctate. Facial details (Fig. 37), malar space quite short; frontal carina complete and continued over much of clypeus, occipital carina fading dorsally but ventrally joining medial carina (Fig. 39c, d); F-I to III each slightly longer than broad (Fig. 37); thorax 2.2x as long as broad in lateral view; propodeal enclosure coarsely punctate and with-weak, downcurving transverse striae (Fig. 43); 2 forewing submarginal cells (Fig. 38); no definable pygidial plate.

Male. Unknown.

Holotype female (HONOLULU), Khogis Mts., New Caledonia, 600 m, I-1969 (N.L.H. Krauss). Paratype female (DAVIS), same data as holotype.

Discussion: This species is similar in structure to *scutellaris*, which also has 2 forewing submarginal cells. However, they are readily separated by the extensive yellow on the head of the latter, as well as its yellow scutellum.

The specific name is given in honor of the collector, N.L.H. Krauss.

Arpactophilus nemoralis R. Bohart new species

(Figs. 33 34)

Description: Female holotype. Length 5 mm. Black, marked with yellow: mandible, scape, trochanters, femora apically, tibiae toward base; fulvous are: flagellum in front, pronotal lobe, tegula, tibiae partly, tarsi. Frons, notum, mesopleuron densely punctate, mesopleuron obscurely transversely striate, propodeal side with some longitudinal carinulae, propodeal enclosure reticulate in transverse pattern (as in Fig. 35); gena polished with scattered punctures; abdomen mostly polished, epunctate. F-I 1.5x as long as broad, II-III each 1.3x; facial details (Fig. 33); frontal carina strong, sharply raised on lower one-third of frons, continuing onto most of clypeus; distance from compound eye to occipital carina 2/3 as long as scape; labrum slightly exposed, bilobed; wings lightly stained, 2 forewing submarginal cells (Fig. 34); no definable pygidial plate.

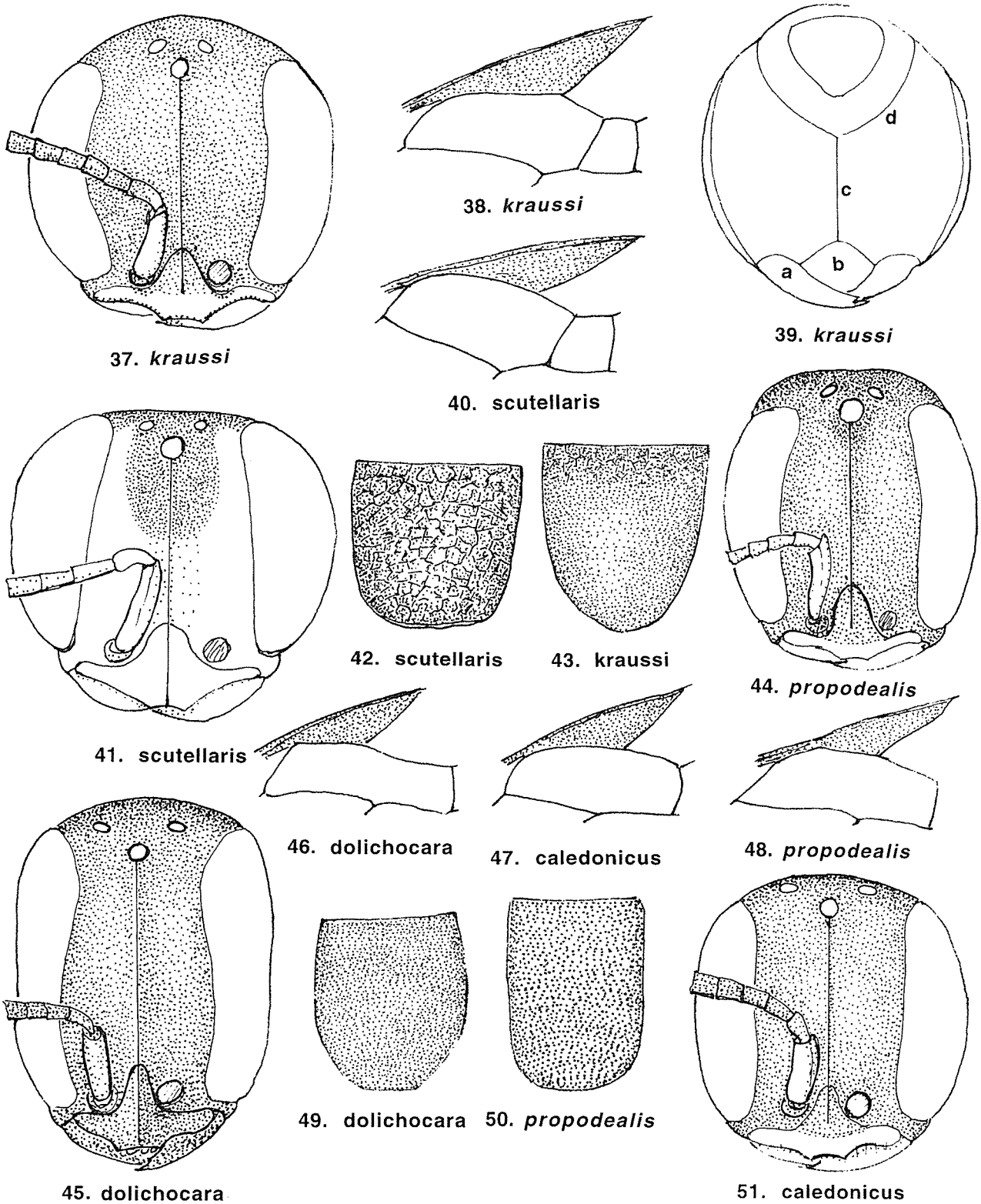
Holotype female (PARIS), Sarraméa, New Caledonia, XII-25-91, acrose forest (M.E. Irwin, D.W. Webb).

Discussion: Both *nemoralis* and *sylvaticus* have the pedicel and F-I about equal in length. They also have the abdomen black and polished. In *nemoralis* the mandible is almost entirely yellow, and the femora are mostly brown. In *sylvaticus* the mandible is black with a small streak of yellow basally. Furthermore, the legs, including the femora, are mostly fulvous in *sylvaticus*.

The specific name is a Latin adjective referring to the habitat in a forested area.

Arpactophilus nigripes R. Bohart new species

Description: Female holotype. Length 3 mm. Black, sparingly marked with yellow: clypeus mostly, mandible dully, scape partly, pronotal lobe, foretrochanter; tarsi fulvous; wings clear, stigma black. Punctation of face, scutum, scutellum fine, close; gena, vertex, mesopleuron partly polished; propodeal dorsum finely reticulate; abdomen polished. Head about as broad as long in front view, vertex behind ocellar triangle about 5 MOD, F-I 1.5x as long as broad, II 1.0x; frontal carina complete, continuing onto base of clypeus; malar space about 1 MOD long; 1 forewing submarginal cell; no definitive pygidial plate.



Figures 37-51, females. 37-39; 43), *A. kraussi*, x 75. 37) face; 38) forewing marginal cell, submarginal cells I-II; 39) head, ventral; a, mandible; b. labium; c. midline carina, d, occipital carina; 43) propodeal enclosure; 40-42), *A. scutellaris*; 40) marginal cell, submarginal cells I-II, x 70; 41) face, x 70; 42) propodeal enclosure, x 50; 44, 48, 50), *A. propodealis*, x 80; 44) face; 48) marginal cell, submarginal cell I; 50) propodeal enclosure; 45, 46, 49), *A. dolichocara*, x 100; 45) face; 46) marginal cell, submarginal cell I; 49) propodeal enclosure; 47, 51), *A. caledonicus*, x 100; 47) marginal cell, submarginal cell I; 51) face.

Male. Unknown.

Holotype female (HONOLULU), Heinghene, New Caledonia, I-1969 (N.L.H. Krauss)

Discussion: Four species of *Arpactophilus* with only a single submarginal cell in the forewing are *caledonicus-nigripes*, *propodealis*, and *dolichocara*. They are all quite small (3 mm long), with a punctate propodeal enclosure, and occipital carina fading dorsally. There is little pubescence, and S-II is not swollen basally. Also, the thorax is fully twice as long as high in lateral view. The species of this one-submarginal cell group differ mainly by details of head shape, clypeal markings, and leg coloration. In *caledonicus* and *nigripes* the head is about as broad as long in front view, and the clypeus is marked with yellow transversely. However, the legs are all yellow in *caledonicus*, but mostly black in *nigripes*.

The specific name is Latin, referring to the color.

Arpactophilus propodealis R. Bohart new species

(Figs. 44, 48, 50)

Description: Female holotype. Length 3 mm. Black, brown, yellow. Brown are: thorax mostly, abdomen dorsally, lighter brown ventrally; clear light yellow are: mandible, clypeus mostly, scape in front, pronotal lobe, tegula, legs entirely; flagellum fulvous; wings clear, stigma dark brown. Punctation generally fine, close; propodeal enclosure with fine, close, microscopic reticulae; abdomen polished, epunctate. F-I 2x as long as high in lateral view, propodeal enclosure 1.5x as long as broad (Fig. 50), frontal carina fine but complete, a little raised anteriorly, continued onto clypeus as a ridge, occipital carina fading dorsally; 1 forewing submarginal cell (Fig. 48); no definable pygidial plate.

Male. Unknown.

Holotype female (HONOLULU), Khogis Mts., 600 m, New Caledonia, I-1969 (N.L.H. Krauss). Paratypes, 3 females (HONOLULU, DAVIS), same data as holotype; 3 females (HONOLULU, DAVIS), Yaboue, New Caledonia, II-III-1978 (N.L.H. Krauss).

Discussion: As in *dolichocara*, the head is longer than broad in front view (Fig. 44). However, the length versus width is only about 1.2x in *propodealis* instead of more than 1.5x in *dolichocara*. Also, the clypeus of *propodealis* is mostly yellow, and the legs are entirely so.

The specific name is a Latin adverb, calling attention to the elongate propodeum.

Arpactophilus schlingeri R. Bohart new species

(Figs. 1-5)

Description: Female holotype. Length 10.5 mm. Black and red. Red are: abdominal segments I, II, basal two-thirds of III; wings light brown overall. Pubescence inconspicuous, quite short and silvery on thorax. Punctation fine and close on notum, moderate on black tergal areas. Face (Fig. 1), frontal carina complete, continued over clypeus, ending in a sharp point over exserted labrum which has 6 teeth or lobes; clypeus also with sharp apicolateral tooth; mandible slender, bidentate; F-I to IV each about 2.2x as long as broad; frons punctate, rugulose, LID a little less than scape length, occipital carina complete, flangelike laterally; pronotum sharply carinate, followed by a series of pockets about 2.5 MOD long, subtended by 12 carinae; scutal parapsides present but shallow; prescutellar sulcus foveolate; omaulus and weak sternaulus present; propodeal enclosure shiny, a median zone of cross carinae (Fig. 3); forewing with 2 submarginal cells, II much broader than high (Fig. 2); S-II abruptly swollen toward base (as in Fig. 19).

Male paratype. Length 9 mm. About as in female but clypeus quite different, marked with white on either side of deep median emargination (Figs. 4, 5), labrum not protruding.

Holotype female (PARIS), New Caledonia: Riviere Bleue Provincial Park (183 m.), at km 19.6 on Bleue Road, XI-28-92, Malaise trap across forest path (E. and M. Schlinger, D.W. Webb). Paratypes (DAVIS), 1 pair, same data as holotype, 1 female, Riviere Bleue Provincial Park (270 m.), 30 km nw. Yate, XII-27-91, Malaise trap across forest path (M.E. Irwin, D.W. Webb); 1 female, Upper La Ni Val., XI-17-92, Malaise trap across logging road (D.W. Webb).

Discussion: Distinctive differences separating *schlingeri* from its supposed relatives in New Caledonia and New Guinea are the unusually broad second submarginal cell (Fig. 2) and red markings of the basal abdominal segments. Separation of the males of *schlingeri* and *irwini* is discussed under the latter species. Males of other presumably related species are unknown.

The specific name honors one of the collectors of the holotype, my friend, Evert Schlinger.

Arpactophilus scutellaris R. Bohart new species

(Figs. 40, 41, 42)

Description: Female holotype. Length 4 mm. Black, marked with yellow: mandible, clypeus, scape, frons except area enclosing ocellar triangle and below it (Fig. 41), head venter, pronotum, tegula, scutellum, pleuron mostly, legs entirely, abdomen basally and ventrally; flagellum fulvous; wings clear, stigma dark brown. Punctation generally fine, close; abdomen polished, epunctate. F-I 2x as long as broad, II 1.8x, thorax 2x as long as high in lateral view, propodeal enclosure about as broad as long, reticulate (Fig. 42), frontal carina complete and extending whole length of clypeus; occipital carina complete; facial details (Fig. 41), head about as broad as long in front view, malar space about I MOD long, 2 forewing submarginal cells (Fig. 40); no definable pygidial plate.

Male. Unknown.

Holotype female (HONOLULU), w. of Ponerihauen, New Caledonia, VII-30-71 (J.L. Gressitt). Paratype female (DAVIS) w. of Ponerihauen, Mt. Aopinae, 550 m. New Caledonia, VII-30-71 (J.L. Gressitt).

Discussion: The extensive yellow markings, including the scutellum, make this a distinctive species. The occipital carina is complete, the propodeal enclosure is reticulate (Fig. 42), and the forewing has 2 submarginal cells.

The specific name calls attention to the yellow scutellum.

Arpactophilus sylvaticus R. Bohart new species

(Figs. 31, 32)

Description: Female holotype. Length 4.5 mm. Black, with fulvous and pale yellow; fulvous are: scape partly, tegula, legs mostly; yellow are: mandible narrowly toward base, scape partly in front; forewing nearly clear, stigma dark brown. Pubescence on lower face appressed, fulvous, inconspicuous. Punctation fine, close, on frons, gena, mesonotum, mesopleuron, propodeal side (among fine longitudinal carinulae); propodeal enclosure coarsely reticulate anteriorly, grading into transverse carinae posteriorly (as in Fig. 30), abdomen polished, practically epunctate. F-I 1.5x as long as broad, F-II-III each 1.3x; facial features (Fig. 32); frontal carina distinct, slightly raised below, extended nearly to apex of clypeus; distance from compound eye to occipital carina 2/3 length of scape; 2 forewing submarginal cells (Fig. 31); no definable pygidial plate.

Holotype female (PARIS), Mt. Khogis, 500 m. 17 km nne. Noumea, New Caledonia, XI20-92 (D,W. Webb).

Description: As stated under *nemoralis*, this medium sized species has the frons punctate, labrum not exserted, propodeal enclosure reticulate, and flagellar articles only as long as the pedicel. It differs from *nemoralis* by the more extensively fulvous legs and the mostly black mandible.

The specific name is a Latin adjective meaning "of woods", referring to its forested habitat.

Arpactophilus webbi R. Bohart new species

(Figs. 15-19)

Description: Female holotype. Length 6.5 mm. Black and yellow. Yellow are: clypeus, labrum, mandible, scape, pronotal lobe, anterior spot on tegula, legs (a little more orange on tarsi); wings nearly clear. Pubescence inconspicuous. Punctation fine and close, terga mostly polished, a few moderate punctures sprinkled on vertex. Face (Fig. 15), frontal carina complete, continued over clypeus, ending in sharp point above exserted labrum which has 6 sharp teeth; clypeus also with sharp apicolateral tooth; mandible moderately stout, ending in 2 long sharp teeth (Fig. 15); F-I to IV about 2x as long as broad; frons closely punctate, LID equal to length of scape; occipital carina complete, flangelike laterally; vertex behind eye 6 MOD; pronotum sharp above, nearly appressed to scutum, separated from it by weak short carinulae (Fig. 18), scutum dull, parapsides weak; omaulus and weakly impressed sternaulus present; prescutellar sulcus foveolate; propodeal enclosure shiny, reticulate (Fig. 17); forewing with 2 submarginal cells, II a little broader than high (Fig. 16); S-II abruptly swollen toward base (Fig. 19).

Male. Unknown.

Holotype female (PARIS), New Caledonia: Riviere Bleue Provincial Park, km 19.6 on Riviere Bleue Road (183 m.), XI-18-92, Malaise trap across forest path (D.W. Webb).

Discussion: Females of related species from New Caledonia and New Guinea (*preposterus* Menke, *rhinocerus* Menke, *papua* Menke, *schlingeri* Bohart, new species, and *irwini* Bohart, new species)

all have the frons with various sculpturing or extensive carinulation instead of a finely granulate surface, as in *webbi*. Furthermore, *webbi* has extensive yellow facial markings, yellow legs, six sharp lateral teeth, and long apical mandibular teeth (Fig. 15).

The specific name honors the collector of the holotype, D.W. Webb.

References

Bohart, R. M., and Menke, A. S. 1976. Sphecid wasps of the world. A generic revision. University of California Press, Berkeley, 695 pp.

Menke, A. S. 1989. *Arpactophilus* reassessed, with three bizarre new species from New Guinea. Invertebrate Taxonomy 1988, 2:737-747.