

Aha, a new genus of Australian Sphecidae, and a revised key to the world genera of the tribe Miscophini (Hymenoptera, Larrinae)

Aha, nowy rodzaj australijskich Sphecidae wraz z uzupełnionym kluczem do światowych rodzajów plemienia Miscophini (Hymenoptera, Larrinae)

BY

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ABSTRACT. A new sphecid wasp genus, *Aha*, is described from Australia for two new species, *ha* and *evansi*, from Western Australia and Victoria, respectively. Only males are known. A revised key to the world genera of the larrine tribe Miscophini is presented to accommodate *Aha* and other recently discovered, but aberrant, forms in the genus *Lyroda* SAY. *Gastrosaricus errans* TURNER is transferred to the genus *Lyroda*.

The following new genus and species belonging to the sphecid tribe Miscophini are described from material obtained in Australia by HOWARD EVANS and ROBERT MATTHEWS. The holotypes of the new species will be deposited in the Australian National Insect Collection, CSIRO, Canberra, Australia. Paratypes will be distributed to the U. S. National Museum of Natural History, the British Museum (Natural History), and the University of California, Davis.

EVANS and MATTHEWS also collected other important miscophinid material during their 1969-1970 and 1972 Australian expeditions which they kindly turned over to me for study. Of particular interest are several new species of *Larrius* MENKE, including the hitherto unknown female, as well as some species of *Lyroda* SAY which are peculiar in having only two submarginal cells and an acetose female pygidial plate.

Gastrosericus errans TURNER was listed in a footnote on p. 256 of BOHART and MENKE (1976) as representing a new genus in the *Miscophini*. However, my recent study of two of TURNER's syntypes has revealed that *errans* is a *Lyroda* with only two submarginal cells (NEW COMBINATION).

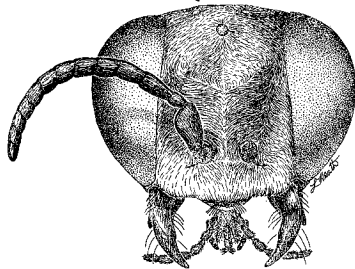
The *Larrisson* and *Lyroda* material will be dealt with in subsequent papers, but a revised key to the genera of the *Miscophini* is presented now because the one published by BOHART and MENKE (1976) does not include *Aha*, and the two-celled *Lyroda* will not key in it. Furthermore, some Australian *Lyroda* lack the median prominence found on the pronotal collar of most members of the genus, a feature stressed in the generic key of BOHART and MENKE. Exceptional forms in several genera require that these taxa key out in two places. To do otherwise would be impractical; the result would be a key with too many conditional clauses. I assume that users of this new key will insert it in their copy of BOHART and MENKE; therefore, I have referred to figures 83-99 in "Sphecoid Wasps of the World", as well as those presented here, to illustrate characters used in the couplets. Terminology used here also comes from BOHART and MENKE. The facial portrait of *Aha ha* was rendered by LINDA HEATH.

Aha Menke, new genus

DESCRIPTION (based on male, female unknown):

Inner orbits straight, converging above; flagellum with 11 articles, none modified; frons convex, without carinae or V-shaped pattern of setae; clypeus with median lobe, no lateral hair brush; labrum short, concealed, margin arcuate and fringed with long setae; inner margin of mandible simple or with subapical tooth, externoventral margin notched; malar space absent; mouthparts short, prementum folded longitudinally, compressed laterally; occipital carina ending just short of hypostomal carina; collar short, nearly as high as setum; episternal sulcus present but evanescent a little below level of pronotal lobe; scrobal sulcus deeply impressed; propodeum short, no dorsal enclosure, dorsum without coarse sculpture or carinae; tarsomere V not swollen, arolium moderate, outer (anterior) claw on all legs much shorter than inner (posterior) claw; foreleg with tarsal rake composed of widely spaced, stout spines, forecoxa sometimes modified, foretrochanter simple; precoxal sulcus present but weakly impressed; midcoxae separated, hindcoxae contiguous; mid and hindleg spinose, spines in two rows on hindtibia; forewing with three submarginal cells and two recurrent veins, both of latter terminating on submarginal II (first rarely interstitial); marginal cell

narrowly truncate, appendiculate apically, second submarginal cell not petiolate but its lateral veinlets narrowly separated at marginal cell or joining there (fig. 2); forewing media diverging from *Cu* before crossvein *cu-a*; length of hindwing jugal lobe about half length of anal arca; tergum I with, II without, lateral carina; tergum I without basal carinae mesad



1. Face of *Aha ha*, male

of lateral carina; tergum VII flattened, densely covered with decumbent setae, but without marginal carinae; sternum VIII narrowed toward apex, bidentate apically (fig. 7); gonostyle prolonged ventrad at base, volsella reduced to a pair of setose areas, aedeagal head without teeth (fig. 6).

Type-species: *Aha ha* MENKE.

ETYMOLOGY

Aha is an arbitrary combination of letters chosen for brevity; it should be treated as feminine.

DISCUSSION

Aha has the general facies of *Tachysphex* KOHL, but the normal ocelli place the genus in the *Miscophini*. Among *Miscophini* genera *Aha* is most similar to *Plenoculus* FOX, a genus unknown in Australasia. Both have a simple frons, 13 articles in the male antenna, notched mandibles, an incomplete occipital carina, fine propodeal sculpture, spinose tibiae,

and a simple foretrochanter. *Aha* differs from *Plenoculus* in several significant ways: the prementum is longitudinally folded (prementum normal in *Plenoculus*), the last tergum is densely setose (bare in *Plenoculus*), the claws are asymmetrical (symmetrical in *Plenoculus*), the second submarginal cell is not petiolate and it receives both recurrent veins (cell petiolate and first recurrent ends on I in *Plenoculus*), the forewing media diverges before *cu-a* (media after *cu-a* in *Plenoculus*), the subgenital plate is bispinose (rounded apically in *Plenoculus*), and the body is totally black (yellow maculations common and gaster often red in *Plenoculus*).

Aha does not seem closely related to any of the Australian miscophini endemics. It keys with difficulty to *Larrisson* in BOHART and MENKE (1976), but in that genus the inner orbits are bowed toward the midline of the face; the prementum is normal; the thorax is more compact; the propodeum is more coarsely sculptured, and propodeal processes are present in the male; the forewing media diverges at, or more commonly, after *cu-a*; recurrent vein I ends on submarginal cell I; the claws are symmetrical; and the subgenital plate is of uniform width and usually only rounded apically, to mention the more obvious differences. The most unusual features of *Aha* are the compressed prementum, the point of divergence of the forewing media, and the tarsal claw asymmetry. The last condition is known elsewhere in the *Larrinae* only in the larrin genera *Gastrosericus* SPINOLA, *Parapiagetia* KOHL and *Tachysphex*, and in these it is usually the inner claw that is shorter, rather than the outer claw as in *Aha*.

Although the female is unknown at present, it doubtless has a foretarsal rake and probably a setose pygidial plate. The tarsal claw asymmetry may be restricted to the male. The two species of *Aha* are described below.

Aha ha Menke, new species

DESCRIPTION (holotype male):

Color: Black, except mandible pale in middle, wings hyaline.

Vestiture: Head, thorax and legs densely covered with short, appressed silver setae which obscure sculpture; setae brownish on vertex behind ocelli, on scutal disk, on propodeal side and on gastral segment VI; appressed setae of frons oriented transversely giving a checkerboard appearance; terga I-V and sterna II-V of gaster with transverse, apical silver fasciae that cover about half of each plate, flattened area of tergum VII

covered with appressed silver setae; erect setae restricted mainly to head and venter of thorax and gaster, those on frons shortest.

Structure: Comparative lengths of flagellomeres I, II, X and XI: 16:13:7.5:10.5, length of flagellomere I slightly more than twice width (16:7.5), VI-X about as long as wide; free edge of clypeal lobe thickened, bearing a median tooth that is directed posteroventrally (fig. 1); inner margin of mandible simple; prementum compressed knife-like, stipes also vertically oriented; thorax without obvious punctation, sculpture fine, uniform; pronotal collar unnotched mesally; propodeal hindface with some transverse ridging mesally; propleuron with an inner, acute projection and a broad, blunt, lateral process that is slightly concave posteriorly, the concavity opposed by a deeper one on forecoxa (figs. 4-5); forebasitarsus with 2 or 3 lateral rake spines (in addition to apical spine) the longest of which is slightly longer than width of tarsomere (fig. 8); tarsomeres II-IV somewhat flattened dorsoventrally, V slightly asymmetrical on all legs, hindtarsal claws as in fig. 3; tergum VII narrowly rounded apically; sternum I with shallow semicircular emargination posteriorly; sterna VI-VII somewhat compressed laterally forming a V-shaped cross-section; sternum VIII as in fig. 7; genital capsule as in fig. 6.

Length: 7.5 mm.

VARIATION

The forebasitarsus has only 2 lateral rake spines in 5 of the paratypes. The lateral veinlets of submarginal cell II are separated on the marginal cell by as much as a midocellus diameter, but in most specimens the cell looks like fig. 2. The two veinlets join at the marginal cell in one wing of one paratype. In this same specimen the first recurrent vein is interstitial in both forewings.

TYPES

Holotype male: Western Australia, Kununurra and vicinity, Sept. 14-16, 1972, H. EVANS and R. MATTHEWS (H. E. EVANS biological note A-449).

Paratypes: Six specimens with same locality data as type and various EVANS and MATTHEWS biological note numbers. Also one metatype (head missing) with same data.

All of these specimens were collected as prey by *Bembix moma* EVANS and MATTHEWS according to the biological notes. These specimens were reported as „Genus n. *Solierella*, sp.” on p. 204 of EVANS and MATTHEWS (1973).

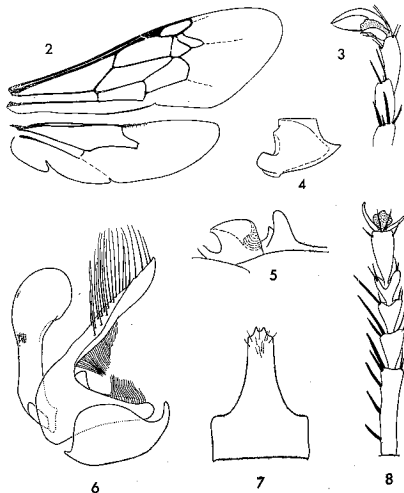
Aha evansi Menke, new species

DESCRIPTION (holotype male)

Color: Black except mandible brownish on apical half; wings strongly infumate.

Vestiture: Head, thorax and legs densely covered with short, appressed silver setae which obscure sculpture; setae dark on vertex, disk of scutum, scutellum, and propodeal side; arrangement of frontal setae similar to *ha*; terga I-IV and sterna II-IV of gaster with silver fasciae that cover about the apical third of each plate, tergum VI with small, apical silver spot, flattened area of tergum VII covered with appressed silver setae; erect setae sparse, restricted mainly to head, pleura and propodeum.

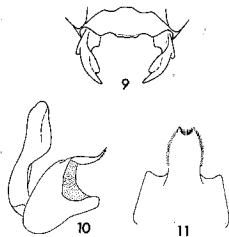
Structure: Comparative lengths of flagellomeres I, II, X and XI: 22:21:12:16, length of flagellomere I slightly more than twice width (22:9.5), V-X about twice as long as wide; free edge of clypeal lobe thickened, feebly bisinuate, lobe bounded by broad, semicircular emargination (fig. 9); inner margin of mandible with subapical tooth (fig. 9);



2-8: Details of *Aha ha*, male: 2 - wings, 3 - apical tarsomeres of right hindleg in lateral profile, 4 - ventral view of left propleuron, 5 - left propleuron and forecoxa in lateral profile, 6 - genitalia in lateral profile (setation somewhat schematic), 7 - sternum VIII, 8 - dorsal view of left foretarsus

DISCUSSION

Because the stipes are in a vertical plane the bulk of the mouthparts is strongly compressed laterally in *ha*. In *Aha evansi* the stipes are normally oriented. The propleural process and opposing forecoxal concavity of *ha* contrast sharply with the unmodified propleuron and forecoxa of *evansi*. The toothless inner mandibular margin, the clypeal outline, the clear wings and fasciate tergum V are other distinctive features of *ha*.



9-11: Details of *Aha evansi*, male: 9 - clypeus and mandibles, 10 - genitalia in lateral profile, 11 - sternum VIII (only marginal setae shown)

prementum strongly compressed apically but stipes horizontally oriented; thoracic sculpture as in *ha*; pronotal collar with small median notch; propodeal hindface with some transverse ridging mesally; propleuron and forecoxa unmodified; forebasitarsus with 2 (left leg) or 3 rake spines (in addition to apical spine) which are about one and a half times as long as width of tarsomere; tarsomeres II-V and claws as described for *ha*

except V is more elongate and suggestive of the banana-like form found in *Liris FABRICIUS*; tergum VII truncate rounded apically; sternum I with broad, shallow, semicircular emargination posteriorly; sternum VI-VII not laterally compressed; sternum VIII as in fig. 11, genital capsule as in fig. 10.

Length: 10 mm.

TYPES

Holotype male: Victoria, 12-21 mi. N. Ouyen, Feb. 24, 1970, H. EVANS and R. W. MATTHEWS.

DISCUSSION

Aha evansi is known from one specimen. The species is dedicated to HOWARD EVANS. *Aha evansi* is a larger, stouter wasp than *ha*, and the dark wings, clypeal outline, and subapical mandibular tooth are distinctive. The normal stipes, propleuron and forecoxa indicate that *evansi* is less specialized than *ha*.

The male genitalia differ considerably between *ha* and *evansi* as figs. 6 and 10 illustrate. The gonostyle of *ha* bears many long setae apicodorsally and the volsellar setae are long. In *evansi* the gonostyle only has a few very short setae and the volsellar setae are short. Sternum VIII also differs between *ha* and *evansi* (figs. 7, 11). In *evansi* the plate is densely covered with short setae apically.

KEY TO SPECIES OF AHA BASED ON MALES

- Clypeus with broad, semicircular emargination lateral to median lobe (fig. 9); propleuron simple, without stout projection posterolaterally; wings infumate; tergum V without silver fascia; southeastern Australia *evansi* MENKE
- Clypeus without semicircular emargination (fig. 1); propleuron with stout projection posterolaterally (figs. 4-5); wings hyaline; tergum V with silver fascia; northwestern Australia *ha* MENKE

KEY TO WORLD GENERA OF THE TRIBE MISCOPHINI

1. Forewing with two or fewer submarginal cells, second submarginal always petiolate when present (figs. 84 E-K, 85) 2
- Forewing with two or three submarginal cells, if only two present then second *not* petiolate (figs. 2, 83, 84 A-D) 7
2. Externoventral margin of mandible entire (fig. 92 E); forewing with only one submarginal and one discoidal cell (fig. 85 F-H); mesopleuron with hypersternaulus (fig. 99 A) 3

- Externoventral margin of mandible notched or angulate (fig. 92 F-G); forewing with two or fewer submarginal and discoidal cells (figs. 84 E-K, 85 A-E); mesopleuron without hypersternaulus 4
3. Hindwing with jugal lobe but without closed cells (fig. 85 F); subdiscoidal cell open posteriorly (fig. 85 F); mandibular socket not separated from oral fossa by forward extension of hypostoma (fig. 99 B); cosmopolitan *Nitela* LATREILLE
- Hindwing without jugal lobe, but with medial and submedial cells (fig. 85 H); subdiscoidal cell of forewing closed posteriorly (fig. 85 H); mandibular socket isolated from oral fossa by forward extension of hypostoma (fig. 99 C); Australia *Auchenophorus* TURNER
4. Forewing with one or two submarginal cells, and marginal cell usually closed apically (figs. 84 E-K, 85 A-C); hindwing with jugal lobe (figs. 84 F-I, 85 A-B); Old and New World 5
- Forewing without submarginal cells, and marginal cell open apically (fig. 85 D-E); hindwing without jugal lobe (fig. 85 D-E); southern Africa 6
5. Midcoxae contiguous behind or nearly so (fig. 94 A); precoxal sulcus strong (fig. 94 A); free clypeal margin usually excised laterally (fig. 91 D); episternal sulcus present; forewing variable but commonly with two submarginal cells and one or two discoidals (figs. 84 E-K, 85 B); Old and New World *Miscophus* JURINE
- Midcoxae usually widely separated (fig. 94 B); precoxal sulcus usually absent or weak (fig. 94 B); free clypeal margin entire (fig. 97 C); episternal sulcus sometimes absent; forewing with only one submarginal and one discoidal cell (fig. 85 A, C); southern Africa *Saliostethus* BRAUNS
6. Forewing without discoidal cells (fig. 85 E); female without pygidial plate *Miscophoides* BRAUNS
- Forewing with one discoidal cell (fig. 85 D); female with triangular pygidial plate bounded by carinae (fig. 89 E) *Saliostethoides* ARNOID
7. Second submarginal cell petiolate (figs. 83 C-D, 84 A-C) 8
- Second submarginal cell not petiolate (figs. 2, 83 A-B, E-F, 84 D) 11
8. Externoventral margin of mandible usually simple (fig. 92 E) (occasionally angulate, fig. 92 F); frons with V-shaped swelling which often bears a V-shaped carina (fig. 91 B), swelling when viewed from above accentuated by arrangement of facial setae (fig. 98 F); pygidial plate usually absent in both sexes; male foretrochanter concave or hollowed posterobasally and forecoxa often with a posterior process (fig. 92 A-C); outer side of hindtibia spineless or with three or four widely spaced spines (fig. 92 J) *Solierella* SPINOLA

- Externovenral margin of mandible notched (fig. 92 C) or angulate (fig. 92 F); frons flat or broadly swollen (figs. 87 C, 91 C), without V-shaped swelling or carinae; pygidial plate usually present in both sexes, defined by carinae (figs. 89 H, 92 I); male foretrochanter and coxa not modified (fig. 92 D); hindtibia usually with numerous spines in one or more rows (figs. 86 C, 92 K) 9
9. Occipital carina joining hypostomal carina; propodeal dorsum coarsely areolate or reticulate (fig. 89 C) (sometimes only longitudinally ridged); female hindcoxa usually with posteroventral spine or tubercle (fig. 86 F); wings usually strongly infumate; Ethiopian and Oriental Regions *Paranysson GUÉRIN-MÉNEVILLE*
- Occipital carina ending before attaining hypostomal carina; propodeal dorsum finely granulate to reticulate or coarsely punctate; female hindcoxa simple; wings usually hyaline 10
10. First recurrent vein received by first submarginal cell (fig. 84 A); pygidial plate usually present; sternum I without posteromedian prominence and II flat or evenly arcuate in lateral profile; Holarctic, including Mexico *Ptenoculus FOX*
- First recurrent vein received by second submarginal cell (fig. 83 D, rarely interstitial between I and II); pygidial plate absent; sternum I usually with posteromedian prominence (fig. 88 B); sternum II curving up to meet apex of I in lateral profile (fig. 88 B); Australia *Sphodrotes KOHL*
11. Forewing with two submarginal cells (figs. 83 F, 84 D) 12
- Forewing with three submarginal cells (figs. 2, 83 A, B, E) 15
12. Female with glabrous pygidial plate; occipital carina ending before reaching hypostomal carina and mandible notched or angulate exteroventrally; male (7 visible terga) antenna with 13 articles and foretrochanter unmodified 13
- Female pygidial plate, if present, densely setose; occipital carina meeting hypostomal carina and mandible notched exteroventrally, or occipital carina not meeting hypostomal carina and mandible entire exteroventrally; male either with antenna of 12 articles or a posteriorly concave foretrochanter 14
13. Propodeal dorsum no more than half as long as wide, with broad, median, longitudinal groove, dorsal surface smooth, polished but with many parallel ridges basally (fig. 89 A); South Africa (male unknown) *Mesopalarus BRAUNS*
- Propodeal dorsum length three fourths width, with median longitudinal carina, surface dull, with fine transverse sculpture; Australia some *Lyroda SAY*
14. Mandible notched exteroventrally; occipital carina meeting hypostomal carina; female with pygidial plate; male unknown but presumably with 10 flagellomeres; Australia *Sericophorus frontalis* (TURNER)

- Mandible entire exteroventrally; occipital carina ending before reaching hypostomal carina; female without pygidial plate; male with 11 flagellomeres; Holarctic some *Solierella SPINOLA*
15. Occipital carina joining hypostomal carina 16
- Occipital carina ending before reaching hypostomal carina 17
16. Female with setose pygidial plate; male (seven terga) with 12 antennal articles; Australia *Sericophorus SMITH*
- Female with glabrous pygidial plate; male with 13 antennal articles; Ethiopian Region some *Paranysson GUÉRIN-MÉNEVILLE*
17. Propodeum short, length of dorsum along midline no more than one third width measured between spiracles; propodeal dorsum with many coarse, longitudinal ridges; first recurrent vein ending on first submarginal cell (fig. 83 E); Australia *Larisson MENKE*
- Propodeum elongate, length of dorsum at least half width; propodeal dorsum at most with fine wrinkles, but usually with strong, median, longitudinal carina; first recurrent vein usually ending on second submarginal cell (figs. 2, 83 A) 18
18. Forewing media usually diverging at or after *cu-a* (fig. 83 A), but if not then pronotal collar with dorsomedian prominence; prementum not longitudinally folded; claws equal; cosmopolitan . . . *Lyroda SAY*
- Forewing media diverging before *cu-a* (fig. 2), and collar simple; prementum longitudinally folded, laterally compressed; outer claw much shorter than inner claw (fig. 3); Australia (female unknown) *Aha MENKE*

STRESZCZENIE

Autor opisuje nowy australijski rodzaj grzebaczy, *Aha*, włączając do niego dwa nowe gatunki: *ha* i *evansi*. Zamieszcza także zmodyfikowany klucz do oznaczania światowych rodzajów *Miscophini*, uwzględniając zarówno nowo opisywany rodzaj, jak i niedawno odkryte, aberatywne gatunki *Lyroda*. Przenosi do rodzaju *Lyroda* gatunek opisany jako *Gastrosericus errans*.

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LITERATURE — PIŚMIENICTWO

- BOHART, R. M., and A. S. MENKE, 1976, Sphecid Wasps of the World, a generic revision, Univ. of California Press, Berkeley and Los Angeles. IX+695 pp.
- EVANS, H. E., and R. W. MATTHEWS, 1973, Systematics and nesting behavior of Australian *Bombix* sand wasps. Mem. Amer. Ent. Inst., no. 20, IV + 387 pp.