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A NEW GENUS OF MINUTE AMMOBATINE BEES (HYMENOPTERA: APIDAE)

Michael S. ENGEL

Division of Invertebrate Zoölogy, American Museum of Natural History,
Central Park West at 79th Street, New York, New York 10024-5192, United States
&
Division of Entomology (Palaeoentomology), Natural History Museum and
Department of Ecology & Evolutionary Biology, 1501 Crestline Drive–Suite #140,
University of Kansas, Lawrence, Kansas 66049-2811, United States

Abstract – A new genus of minute ammobatine bees is described and figured. C*hiasmognathus* gen. n. (Apidae: Nomadinae: Ammobatini) consists of three previously described species; *Chiasmognathus gussakovskii* (Popov) comb. n., *C. orientanus* (Warncke) comb. n. (with *Pasites orientanus cyprius* Warncke as a new synonym), and *C. aegyptiacus* (Warncke) comb. n.; as well as three or four additional species to be described in a forthcoming contribution. The genus occurs in eastern Europe, the Levant, and central, southwestern, and southern Asia. *Chiasmognathus* are cleptoparasites of species of *Nomioides* (Halictidae: Halictinae: Nomioidini).

KEY WORDS: Apoidea, Anthophila, Nomadinae, Ammobatini, new genus, *Chiasmognathus*, taxonomy, Palaearctic, Oriental

Izvleček – NOV ROD MAJHNIH ČEBEL PLEMENA AMMOBATINI (HYMENOPTERA: APIDAE)

Opisan in prikazan je nov rod majhnih čebel plemena Ammobatini. *Chiasmognathus* gen. n. (Apidae: Nomadinae: Ammobatini) vključuje tri predhodno opisane vrste: *Chiasmognathus gussakovskii* (Popov) comb. n., *C. orientanus* (Warncke) comb. n. (skupaj s *Pasites orientanus cyprius* Warncke kot novim sinonimom) in *C. aegyptiacus* (Warncke) comb. n., in tudi tri ali štiri dodatne vrste, ki bodo opisane v prihodnjem prispevku. Rod je razširjen v vzhodni Evropi, Levanti, ter srednji, jugozahodni in južni Aziji. Vrste rodu *Chiasmognathus* so kleptoparaziti vrst iz rodu *Nomioides* (Halictidae: Halictinae: Nomioidini).

KLJUČNE BESEDE: Apoidea, Anthophila, Nomadinae, Ammobatini, nov rod, *Chiasmognathus*, taksonomija, palearktična in orientalna regija

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Introduction

Bees of the tribe Ammobatini, like all nomadines, are cleptoparasitic. The tribe consists of about 90 species in seven genera and is generally found in the Holarctic, Ethiopian, and Oriental regions (Michener, 2000). The existence of an undescribed genus of minute ammobatines (Fig. 1) has been known for quite some time, study of which has been slowly advancing as more and more material has become available. The small size of these cleptoparasites (as little as 2.1 mm in total body length), indicated an equally small host. In 1984 Dr. J. G. Rozen, Jr. (of the American Museum of Natural History) first collected in Baluchistan a short series of individuals along with immature stages of the cleptoparasite from nests of *Nomioides patruelis* Cockerell (Halictidae: Halictinae). Later, additional species were collected by others in the United Arab Emirates, also in association with *Nomioides* (*N. rotundiceps* Handlirsch), further establishing the host relationship. These records confirmed the suspicions of Popov (1951: 900) who surmised that that *Nomioides* might be the host of the minute bee he had described earlier as *Parammobatodes gussakovskii* (now understood to belong in the genus newly proposed herein). Another species belonging to this new genus, *Pasites orientanus* Warncke (Fig. 1), has been captured in circumstances with *N. minutissima* (Rossi) (Warncke, 1983), perhaps representing the host for this bee. *Nomioides*, comprising a substantial number of small species found throughout the greater part of temperate and tropical regions of the Old World and most numerous in xeric localities, was not previously confirmed to have an apoid cleptoparasite outside of the conjecture by Popov (1951). Species of *Nomioides* commonly occur in large numbers, and it is likely that attentive collecting at nest-sites whenever *Nomioides* are encountered will yield more specimens and species.

As presently understood, the new genus consists of six or seven minute species, probably all cleptoparasitic on *Nomioides*, known from localities in eastern Europe, the Levant, and central, southwestern, and southern Asia. The genus is established herein in order to make its name available for those interested in publishing an account of the biology and immature stages of the group. In the present contribution I have only included those previously named species. A complete account of the new species from Oman, the United Arab Emirates, Kyrgyzstan, and Sri Lanka, will be forthcoming (Engel, in prep.). Morphological terminology for the description follows that of Engel (2001).

Taxonomy

Chiasmognathus gen. n.

Hameria Baker, 2004: 98. *Nomen nudum*.

Type species: *Parammobatodes gussakovskii* Popov, 1951.

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Diagnosis: The new genus can be most readily recognized by the combination of its minute body size (*ca*. 2–3.6 mm in the total length); enlarged pedicel which is basally closely adapted to the scape (Fig. 1) (the modified pedicel apparently functions as an extension of the scape); long axes of closed mandibles crossing at right-angle (similar to *Sphecodopsis* subgenus *Pseudodichroa*: *vide* Rozen, 1968), recessed into proboscidial fossa, filling space between labral margins and adjacent anterior postgena (Fig. 7); pronotum in dorsal aspect concealed beneath anterior margin of mesoscutum; forewing venation contracted basad; marginal cell truncate; 1rs-m absent (*i.e*., two submarginal cells: Fig. 3); hind wing without jugal lobe (Fig. 3); first metasomal tergum in dorsal aspect broader than long (not elongate as in *Pasites*); female with sixth metasomal sternum bearing elongate process that is deeply-bifurcate apically (this process is slender and weakly notched in *Pasites*); male eighth metasomal sternum with spiculum greatly produced, apically dilated; male with gonobase greatly reduced and gonocoxae fused dorsally for greater part of their length; penis valves not fused with aedeagus.

Description: General characters: Body size minute, approximately 2 mm in length. Vertex raised (Fig. 2); head in ventral aspect not strongly contracted behind compound eyes but broadly rounded (abruptly contracted in *Ammobates* and *Pasites*, *cf*. Figs. 4 and 6 with 7, intermediate in *Parammobatodes*, Fig. 5); clypeus weakly convex, in lateral aspect of head little protuberant, in ventral aspect (Fig. 7) its anterior margin lacking distinct lateral abscissae and little advanced before a line drawn tangent to compound eyes, the whole head anteriorly in ventral aspect weakly convex (*cf*. Figs. 4–7); antennal toruli set at mid-level of compound eyes but appearing low on face owing to raised vertex; median ocellus set well above line drawn tangent to summits of compound eyes; genal area in lateral aspect about as broad as compound eye; malar area vestigial, posterior mandibular base touching margin of compound eye; labrum little longer than broad, scarcely extending rearward of mandibular condyles, with truncate base and obtuse apex, its lateral margins almost uniformly convex, its apex not reflexed; antennae with 12 articles (females and males); pedicel enlarged, basally closely adapted to scape (Fig. 2), at base as broad as apex of scape, apically roundly contracted to narrow (much less than ocellar diameter) articulation with flagellum, its surface sculpture similar to that of scape; flagellum subclavate, flagellar articles from second to penultimate developing progressively from strongly transverse to quadrate, terminal flagellar article massive, nearly as long as two preceding flagellar articles; axes of mandibular articulations strongly convergent anteriorly, tangent of axes meeting at right-angle (Fig. 7); long axes of closed mandibles crossing at a right-angle (Fig. 7); closed mandibles completely recessed in proboscidial fossa, filling space between labral margins and adjacent part of postgenal area, not at all protuberant, their flat exterior surfaces forming with labrum and postgenal area a plane surface; maxillary palpi single-segmented.

Mesosoma globular (Fig. 1); pronotum in dorsal aspect concealed beneath anterior margin of mesoscutum, in profile forming, dorso-medially, part of anterior

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wall of mesosoma, not projecting forward of anterior margin of mesoscutum and lacking any distinct dorsal surface, at its highest point depressed well below level of dorsum of mesoscutum; mesoscutum anteriorly in profile strongly uniformly convex, without distinct anterior surface; mesepisternal carina absent; hypoepimeral area not or scarcely differentiated; mesoscutellum not constricted at base, simply convex, without or with weak indication of a medial longitudinal sulcus; tegula of normal proportions; metanotum without median protuberance, in lateral aspect not arresting general profile of dorsum of mesosoma; metasternum not spinosely produced. Wings of normal proportions; forewing venation contracted proximally (Fig. 3); marginal cell short, much shorter than distance from apex to wing tip, broadly, squarely truncate and feebly appendiculate, projections of R_1 and Rs beyond marginal cell vestigial (Fig. 3); 1rs-m absent (*i.e.*, two submarginal cells); 2m-cu and 2rs-m varying in position but typically confluent; 2cu-a situated well before vannal incision; hind wing venation reduced, with distal abscissae of longitudinal veins vestigial; jugal lobe absent (Fig. 3); hamuli few, series originating distad origin of Rs. Propodeum short, without a clearly defined dorsal surface, basal area small and weakly defined, in profile convex dorsally, strongly declivitous posteriorly, lacking special features.

First metasomal tergum of normal proportions, in dorsal aspect conspicuously broader than long (not elongate as in *Pasites*).

Integument generally glossy, with well-spaced, moderately strong punctures and, where present, any microsculpture weak.

Coloration variable, black to darker or paler castaneous (*e.g.*, Fig. 1), in paler examples the mesoscutum and head more persistently dark.

Vestiture generally pale, sparse, more conspicuous on head anteriorly, genal areas, and mesepisterna, tending to form conspicuous tracts adjoining margins of dorsal mesosomal tagmata, on first metasomal tergum, and adjoining apical margins of succeeding exposed terga.

♀: Sixth metasomal tergum, usually concealed in dried material, with broad, flat, apically truncate pygidial plate, an *Analstutz* not developed; fifth metasomal sternum not longitudinally carinate, formed much as in Pasites, but its apical emargination shallow, the apicolateral lobes not overlapping; sixth metasomal sternum usually not exserted in dried material, only the deeply bifurcate apical process more or less visible.

♂: Clypeus with distinctive, long, incurving setae arising from extreme anterolateral angles; seventh metasomal sternum triangular, basally deeply, angularly emarginate, apically attenuate, sparsely micro-setose; eighth metasomal sternum (Fig. 8) with spiculum greatly produced, at its apex laterally compressed and dilated (as in *Parammobatodes*), the disc short, transverse, the apodemes prominent, the sclerite terminating, beyond a post-discal contraction, in two broad, spreading, membranous lobes that are separated by a narrow incision originating at the apex of the discal area, the lobes apically with well-defined micro-setose areas; genitalia (Fig. 9) with gonobase greatly reduced; gonocoxae fused dorsally for greater part of their length, their inner margins then diverging at an angle of about 90°, their apices

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dorsally angulate, narrowly rounded; gonostyli well developed, leaf-like, freely-articulated with gonocoxae; penis valves not fused with aedeagus, apodemes of penis valves extending basad to about mid-length of gonocoxae.

***Derivatio nominis*:** The new genus-group name is a combination of the Greek terms *chiasmos* (meaning "arranged crosswise") and *gnathos* (meaning "jaw"), and is a reference to the crossing of the mandibles in repose. The name is masculine.

Comments: In Michener's (2000: 641) key to the genera of Ammobatini *Chiasmognathus* runs to *Parammobatodes*, under which genus it is referred to (p. 643), on the basis of information and material communicated by the late Dr. Donald B. Baker, in the terms, "minute species of a new genus *Parammobatodes* known from southwestern Asia to Sri Lanka are cleptoparasites of *Nomioides*." As noted by Michener (2000), *Chiasmognathus* differs from all other Ammobatini, except the relatively gigantic (15–22 mm) Madagascan *Melanempis*, in the absence of the hind wing jugal lobe. The 12 antennal articles in males is also similar to *Melanempis*, as well as *Pasites* and *Parammobatodes*.

Chiasmognathus shares with the South African *Pseudodichroa* (today considered a subgenus of *Sphecodopsis*) the peculiar flattening of the ventral surface of the head and close co-adaptation of the labral and mandibular margins, although the condition in *Pseudodichroa* is not so extreme and the mandibles are longer, in repose their apices resting on the opposed anterior genal areas.

The genus presently includes three named species, outlined below, although three or four other species are also known from Pakistan, Kyrgyzstan, Oman, the United Arab Emirates, and Sri Lanka (Figs. 2–3, 7). These species will be described and figured in a forthcoming contribution (Engel, in prep.). An account of the immature stages of *Chiasmognathus* is being prepared by Dr. Rozen (pers. comm.).

Chiasmognathus gussakovskii (Popov, 1937) comb. n.

Parammobatodes gussakovskii Popov, 1937: 10 [♂].
Parammobatodes gussakovskyi Popov, 1949: 696 [♀]. *Lapsus calami*.

Comments: *Chiasmognathus gussakovskii* was well described and figured by Popov (1937). Popov (1937) drew attention to details of the venation but not to the absence of the hind wing jugal lobe, although its absence is clear from his figure.

Distribution: Tajikistan.

Chiasmognathus orientanus (Warncke, 1983) comb. n.
(Fig. 1)

Pasites orientanus Warncke, 1983: 276 [♀♂].
Pasites orientanus cyprius Warncke, 1983: 277 [♀♂]. Syn. n.

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Comments: Females from various localities in the Levant tentatively referred to *C. orientanus* (Warncke) show some minor variation in sculpture, vestiture, and color characters. Pending the availability of males from a comparable spread of localities and dates, it must remain uncertain whether more than one species is involved. The species of *Chiasmognathus* are all superficially very similar and pronounced diagnostic characters are lacking between species; further, available material of all species is generally inadequate to demonstrate whether observed variation may be linked with spatial, seasonal, or climatic factors or whether, as has been shown in some cleptoparasitic bees, some degree of host-specificity may be present.

Distribution: Bulgaria, Turkey, Crete, Cyprus, Palestine.

Chiasmognathus aegyptiacus (Warncke, 1983) comb. n.
(Figs. 8–9)

Pasites aegyptiacus Warncke, 1983: 278 [♀♂].

Comments: Warncke's holotype was not examined, but since the material studied and figured herein (Figs. 8–9) came from the same original series as the type, identity has been presumed. Warncke's figures in general tend to be rather inadequate and so minor discrepancies between the male terminalia presented herein and those provided by him in 1983 are of little significance as his illustrations often cannot be trusted.

Distribution: Egypt, Israel.

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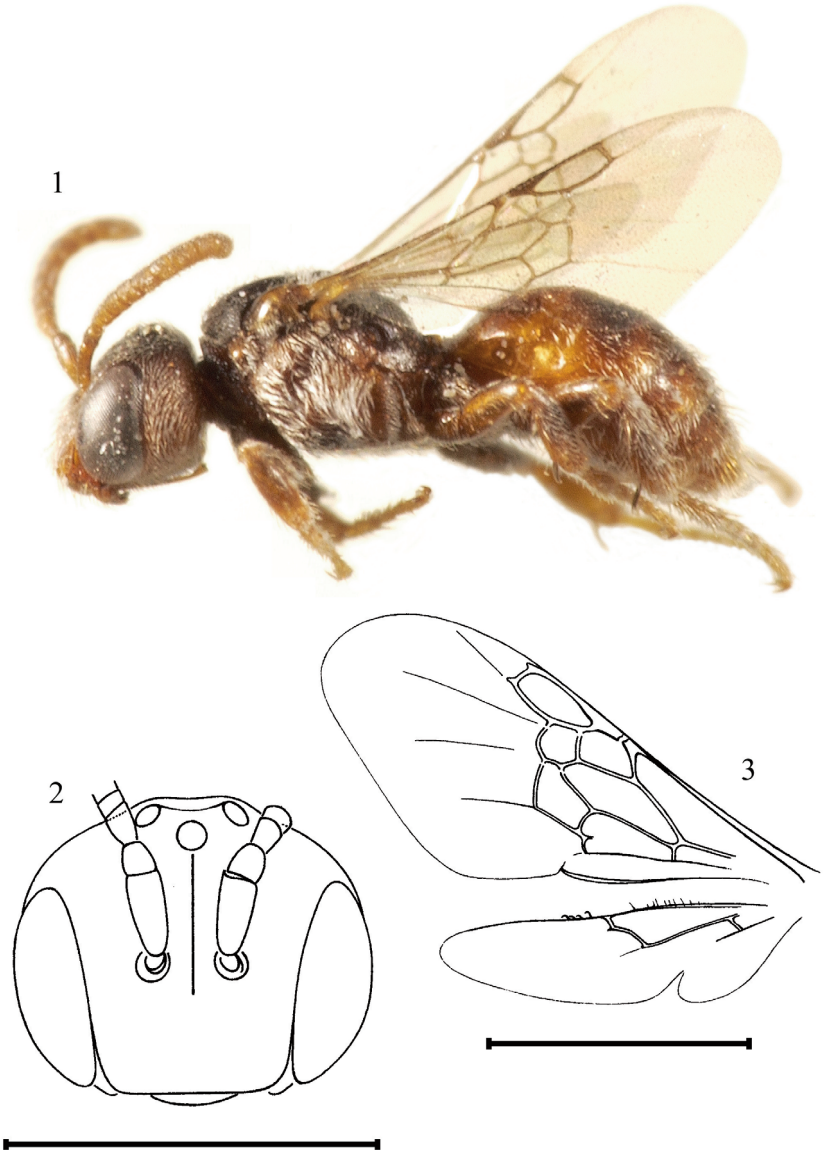

Figs. 1–3: *Chiasmognathus* gen. n.; 1) Lateral habitus of *Chiasmognathus orientanus* (Warncke) comb. n. (Turkey), female (bee approximately 3 mm in total length); 2) Facial aspect of female of *Chiasmognathus* sp. (Sri Lanka); 3) Wing venation of female of *Chiasmognathus* sp. (Sri Lanka). Scale bars = 1 mm.

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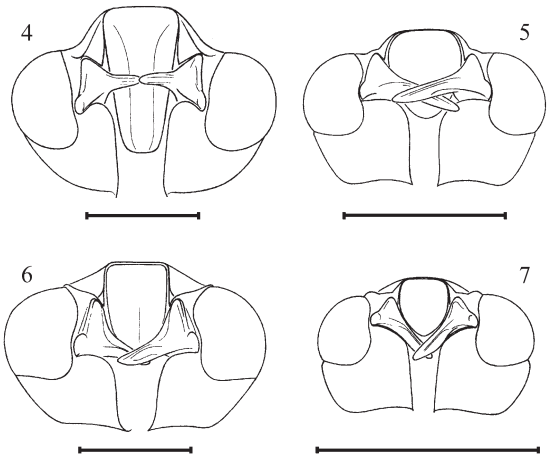
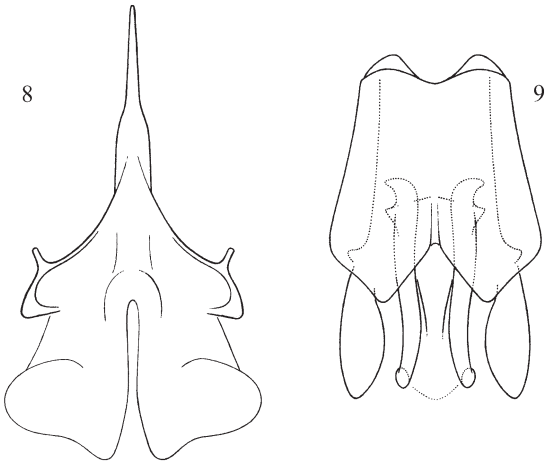


Figs. 4–7: Ventral aspects of various ammobatine heads, females; 4) *Ammobates* (*Ammobates*) *niveatus* (Spinola), male (Egypt); 5) *Parammobatodes indicus* (Cockerell), female (India); 6) *Pasites maculatus* (Jurine), female (Iran); 7) *Chiasmognathus* sp., female (Sri Lanka). Scale bars = 1 mm.



Figs. 8–9: Representative male terminalia of *Chiasmognathus* gen. n.; 8) Eighth metasomal sternum of *Chiasmognathus aegyptiacus* (Warncke) comb. n.; 9) Dorsal aspect of genitalic capsule of *C. aegyptiacus*.

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