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A NEW GENUS OF NOMADINE BEES FROM NORTH AFRICA (HYMENOPTERA: APOIDEA, ANTHOPHORIDAE)

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Aethammobates prionogaster gen. et sp. n. Anthophoridae: Nomadinae) is described from a unique male collected in Egypt. The new genus is referred to the Holcopasitini and its relationships with other holcopasitine bees are discussed.

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Among a number of epeoline bees received many years ago from the late Prof. Dr. H. Priesner was a single male of a strange nomadine bee that could not be referred to any described genus. A description and figures were prepared, and the specimen was then set aside in the expectation that further specimens, including possibly the female, would sooner or later come to light. After more than 40 years, this expectation has not been fulfilled, although the locality where the bee was obtained (Gebel el Asfar, near Cairo) was one much visited by both pre-War and more recent local collectors. Since the locality is now being devastated by construction works (C.G. Roche, in litt., 6 September, 1992), making the recovery of further material less likely, and since also the systematics of the Nomadinae have recently come under review by several authors, notably Alexander (1990) and Roig-Alsina (1991), it seems desirable to place the new genus and species on record.

Aethammobates gen. nov.

Description. – Head in frontal aspect transverse, the eyes rather small, separated by 1.2 times their length, their inner margins convex, subparallel; clypeus short, carinate laterally along epistomal suture, paraocular area adjacent to carina slightly concave and narrowly impunctate; labrum elongate (length to breadth ration 1.44 : 1), apically entire, lacking discal tubercles; antennal sockets at mid-level of eyes; interantennal carina divided, forming a V-shaped protuberance, the open end of the V upward; facial foveae absent; vertex longer than inter-ocellar distance; preoccipital ridge carinate; malar area rudimentary. Antennae 13-segmented, scape long (length to breadth ratio 3 : 1); pedicel free; first flagellar segment long (length to breadth ratio 3 : 1), equal to segments 2+3; segments 2-10 passing from transverse to quadrate. Mandibles simple, with weak basal protuberance opposed to lateral termination of clypeal carina; only posterior articulation in contact with eye. Stipital comb absent; maxillary palpi 5-segmented; blade of galea moderately, uniformly sclerotized, acuminate, extreme apex very narrowly rounded.

Mesosoma broad, dorso-ventrally compressed. Pronotum with well developed dorsal surface limited anteriorly by an uninterrupted carina; anterior surface broad, flat, rounded abruptly into collum. Mesoscutum little convex; parapsidal lines well marked, about as long as tegula; axillae not protuberant; scutellum extending laterad slightly beyond axillae, with distinct dorsal and posterior vertical surfaces separated by a weak, irregular (interrupted by punctation) carina, slightly overhanging subvertical, coplanar surfaces of metanotum and propodeum; omaulus continuous across mesepisternum, forming prominent angles on either side of a median, semicircular inflexion; mesepisternum anterior to intermediate coxae strongly transverse, transversely concave. Metanotum with prominent lateral lobes. Wings (fig. 4) short, forewing about 0.6 body length. Forewing bare basally, becoming pubescent apically, especially beyond cells; marginal cell broad, rather broadly rounded at apex, apex separated from wing-tip by less than cell length; distal abscissa of Rs absent; two submarginal cells, the second much shorter than the first, the first receiving 1 m-cu near its apex, the second 2 m-cu beyond the middle. Hindwing with jugal lobe

very short; second abscissa of M + Cu about 1,5 times longer than cu-v, not quite half as long as M. Legs of normal proportions. Anterior coxae proximate, transverse, the trochanters widely separated; tarsus sub-bipectinate, basitarsus and segments two to four apically each with a few strong setae on either side; basitarsus flattened and slightly expanded apicad. Intermediate coxae widely separated, short, much shorter than distance from their summits to posterior wing bases; femur broad; tibia without anterior setose area, coarsely spiculate. Posterior coxae large, broad, inwardly weakly, externally strongly carinate; tibiae coarsely spiculate. Arolia present, normally developed.

Metasoma broad, depressed, greatest width at apex of segment 2. Tergum 1 with vertical anterior and horizontal dorsal surfaces separated by a deeply arcuate carina, in dorsal aspect with prominent lateral angles; marginal areas of terga abruptly and progressively more strongly depressed caudad, the margins of the discal areas passing from subserrate on tergum 1 to strongly denticulate on terga 4-6; pygidial plate strong, rostriform, rounded apically, not constricted basally, considerably exceeding apical margin of segment; sternum 6 laterally dentate.

Vestiture generally squamiform, on the terga forming basal and marginal fasciae, not maculae; simple, erect hairs largely confined to mandibles and disc of labrum; anterior angles of malar areas not penicillate; eyes bare; sterna without subapical fimbriae of modified hairs, but sterna 5 and 6 mesially with fine, dense, erect pubescence, on 6, towards the lateral teeth, becoming longer and directed mesad.

Integument black with extensive pale areas, the appendages and metasoma predominantly pale; moderately strongly, moderately densely to subreticulately punctate, microsculpture not evident at 37,53.

Distribution. – N.E. Africa.

Host. – Not known.

Type species. – *Aethammobates prionogaster*, sp. n.

Derivatio nominis. – Gr. ἀήθης, strange, + *Ammobates*, nom. propr. Hymenoptera

Aethammobates is separated from other nomadines by a variety of autapomorphies, but for purposes of recognition its general habitus and the modifications of the pronotum and first metasomal tergum are immediately diagnostic (see Discussion).

Aethammobates prionogaster sp. n.
(figs. 1-4)

Type material. – Holotype ♂: 'Coll. A. Mochi / 27.V.37 / Geb. Asfar / Egitto' (in coll. Baker)

Description

Male. – Structural characters: See generic description. POL = OOL. Hamuli 8. Length 7.5 mm, forewing 4.75 mm.

Vestiture. The face, dorsal surface of pronotum, peripheries of mesoscutum and scutellum, mesepisterna, and outer ventral surfaces of posterior coxae, all more or less densely clothed with white squamiform or subsquamiform pubescence, that on the pronotum apparently particularly dense (matted in type); elsewhere on head and mesosoma sparser, the individual hairs becoming longer and less squamiform. Terga with broader, white, medially emarginate, laterally expanded, basal fasciae and narrow, entire, apical fasciae, filling the depressed marginal areas, of squamiform pubescence; tergum 5 nearly completely covered. Disc of pygidial plate with similar pubescence. Sterna 2-4 with weak submarginal fasciae, sterna 5 and 6 medially with fine, dense, erect pubescence (as noted in generic description - possibly homologous with pre-genital brush in *Nomada*).

Integument of head and mesosoma black with extensive pale areas. Clypeus, anterior extremities of paraocular areas, malar areas, labrum, small maculae adjacent to summits of eyes, larger maculae on genal areas adjacent to mandibles, extending narrowly upwards almost to summits of eyes, labrum and all head appendages (except the mandibles apically) castaneous, the flagellum darker. Lateral lobes of pronotum, axillae, tegulae, sclerites of wing bases, wing veins (the costa darker), and legs (the coxae basally darker) castaneous. Metasoma castaneous, terga 2-5 discally progressively, irregularly (possibly the result of post-mortem decomposition) darker; sterna 2 and 3 discally largely, 4 and 5 almost wholly, dark. Labrum smooth, moderately strongly, irrergularly punctate; anterior face of pronotum smooth, impunctate; mesoscutum and scutellum smooth, moderately densely, simply punctate; terga smooth, medially densely, laterally reticulately, punctate, the punctation coarsest on tergum 2, on tergum 1 about equal to that of mesoscutum, on terga 3-5 progressively finer. Margins of pygidial plate reflexed.

Derivatio nominis. – Gr. πριον – ώδης / ωτός, serrated, + gaster.

Discussion

Both Alexander (1990) and Roig-Alsina (1991) have recently published cladistic analyses of nomadine bees. Roig-Alsina's analysis was based primarily (15 out of 22 characters) on characters exclusive to the female, and is consequently of limited use in the present context. Alexander's analyses were based on (1) larval characters only, (2) on adult characters of those genera where larvae were known, (3) on both larval and adult characters of these genera, and (4) on the adult characters of all genera known to him. It is this last analysis, (4), that is relevant to the placement

Figs. 1-4. *Aethammobates prionogaster* sp.n.

Table 1 Data matrix for characters as listed by Alexander, Appendix 6; codings in accordance with Alexander, Appendices 3 and 5.

Characters											
	1	2	4	5	a	6	7	8	9	10	11
Holcopasites	1	0	0	0	1	0	0	1	0	0	0
Schmiedeknechtia	1	0	0	0	-[1]	0	0	0	0	0	0
Aethammobates	0	0	1	0	0	0	-[2]	0	1	0	2
	12	13	14	15	16	17	b	c	18	d	19
Holocopasites	0	0	0	0	0	1	1	0	1[4]	1	0
Schmiedeknechtia	0	0	0	0	0	1	1	0	1[4]	1	0
Aethammobates	1	1	0	0	0	0[3]	0	1	1	1	1
	20	21	e	f	g[5]	22	h	23	24	29	32
Holocopasites	1	0	1	0	0	0	2	1	0	1	0
Schmiedeknechtia	1	0	1	0	0	0	2	1	0	1	0
Aethammobates	1	0	1	?	0	0	2	1[6]	0	0	0[7]

Notes on matrix

(1) character a: Antennal sockets below mid-level of eyes, but not far below; no code. – (2) character 7: 'Length/width of first flagellomere' = 3: no code. – (3) character 17: No 'patches of appressed squamiform setae': Alexander presumably refers to discrete metasomal maculations of *Holocopasites* and *Schmiedeknechtia*. – (4) character 18: Incorrectly coded '0' by Alexander: vein 1st r-m of forewing is absent (two submarginal cells). – (5) character g: 'arising from' in Alexander's Appendix 5 presumably means 'rising from' (i.e., in lateral aspects bends upward from ventral plane of mesosoma immediately before intermediate coxae). – (6) character 23: a weak, short, dorso-basal carina present on posterior coxa. – (7) character 32: Coded '0' since apex narrowly rounded, subacuminate, but galea is more than weakly sclerotized.

of *Aethammobates*. Alexander's data matrix (his Appendix 6) employed 46 characters, of which six applied solely to the female, leaving 40 in which *Aethammobates* could potentially be compared. In practice, since the holotype and only known specimen of Aethammobates has not been dissected (cf. Roig-Alsina's comment, 1991: 25, on the pre-episternal sulcus in *Rhopalolemma*), comparison has been limited to 33 characters. These have been covered in the description given above, and are now given in coded form, following Alexander's Appendices 3 and 5, as an extension of his data matrix, in Table 1. This table reproduces Alexander's codings, but substitutes observed values for six characters marked with a *quaere* in his matrix.

It should be noted that Alexander's codings, here and elsewhere, cannot always be accepted because he did not see certain described and undescribed taxa that would have necessitated different coding or the adoption of additional codes; however, a complete revision of his data matrix, which might well result in significant changes in his cladogram, is beyond the scope of the present paper. Important characters that should be taken into account in future work on the phylogeny and classification of the Nomadinae include the presence of facial foveae in some *Nomada* (a group of, chiefly, *Panurgus* parasites); the development of an anal truncation, with associated modifications of the apical sterna, among the pasitines (Bischoff 1923: 585, Analstutz); and modifications of the antenna in such genera as *Morgania* and *Pasitomachthes*, where the scape and pedicel may be coalescent, forming a single functional unit (Baker 1971: 7, footnote).

Inspection of the extended matrix confirms *a priori* impressions that *Aethammobates* shares a preponderance of characters with *Holcopasites* and *Schmiedeknechtia* and must be placed in the Holcopasitini.

While obviously most nearly related to *Holcopasites* [Nearctic, revised by Linsley (1943, as *Neopasites*) and by Hurd and Linsley (1972)] and *Schmiedeknechtia* [western palaearctic, revised by Popov (1933)], and sharing such derived characters as the lateral processes of the metanotum and certain venational details, *Aethammobates* is not close to either. It differs from both in, among other characters:

1. The dorso-ventrally compressed form of mesosoma and metasoma.
2. The mid-dorsally exposed pronotum with sharply differentiated dorsal, densely pubescent and anterior, glabrous surfaces. (In lateral aspect, the pronotum resembles that of *Pae* (Sphecoidea) as illustrated by Bohart & Menke (1976: 15, fig. 3A),] In *Holcopasites* and *Schmiedeknechtia* the pronotum is, as in most other bees, recessed beneath the mesoscutum with only its lateral lobes and, when the head is deflexed, the collum conspicuous in dorsal aspect.
3. The V-shaped interantennal carina.
4. The strongly expanded intermediate femora.

5. The pronounced basal truncation of the mesosoma.
6. The form of the first metasomal tergum, which is broadly, deeply emarginate, with prominent antero-lateral angles (see fig. 3) and the anterior and dorsal surfaces sharply, rectangularly separated.
7. The presence of basal and marginal tergal fasciae and the absence of of discrete spot- or bar-like markings.

Of these, characters 1-6 appear as autapomorphies.

Aethammobates differs further, from male *Holcopasites*, in the 13-segmented antennae, and from *Schmiedeknechtia* in the form of the pygidial plate, which is not narrowed basad; in not having the inner orbits convergent below; in not having the anterior mandibular articulations in contact with the eyes; and in the venation: in *Schmiedeknechtia* either both 1 m-cu and 2 m-cu are received by second Rs, or (*Cyrtopasites*, a single species with convex mesoscutum and fine and sparse punctation) 1 m-cu is interstitial with or slightly precedes 1 r-m.

Biology

It is interesting to speculate on the possible host of *Aethammobates*. Known hosts of *Holcopasites* and *Schmiedeknechtia* are panurgines. *Camptopoeum* and *Meliturgula* are possible candidates, but the former. which is normally abundant where it does occur, and which appears not to have been recorded from the Cairo area (it is not represented in recent, extensive Egyptian collections), has species of *Parammobatodes* as its regular parasites. The somewhat flattened shape of *Aethammobates* suggests some correlation with habits or host. Both sexes of *Meliturgula* have a conspicuously broad or flattened metasoma: regional species are few in number and rare in collections; nothing is known of their biology.

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