

## A Revision of *Elasmosoma* Ruthe (Hymenoptera, Braconidae) with Two New Species from Mongolia\*

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**Abstract** — Three new species of *Elasmosoma* are described — two from Mongolia, the third from Europe. A lectotype is designated for *E. luxemburgense* WASMANN and there is a key to nine of the species of *Elasmosoma*. With 15 figures.

The subfamily Neoneurinae consists of the genera *Neoneurus* and *Elasmosoma* both of which are found in association with ants. The two genera are closely similar morphologically and the few recorded observations upon their host selecting and ovipositing behaviour show that they probably also have closely similar life histories. From studies of their larval and adult morphology and of their biology it is now generally accepted (ČAPEK 1970) that Neoneurinae are more closely related to Euphorinae than to Microgasterinae where they have frequently been put in the past.

**Biology** — The evidence that *Neoneurus* and *Elasmosoma* are parasitic upon ants is chiefly circumstantial. It is that the parasites are frequently found in association with ants, in which they take an active interest of which the ants appear to be aware. PIERRE (1893) and DONISTHORPE (1927) claim to have observed *Elasmosoma* ovipositing in the abdomen of adult worker ants, and DONISTHORPE, also claims to have reared *Elasmosoma* from observation nests. DONISTHORPE's statements, however, almost certainly apply to *Neoneurus* following MORLEY's (1914) misidentification of *Neoneurus halidaii* MARSHALL as *Elasmosoma berolinense* RUTHE, a nomenclatorial confusion which persisted until cleared up by NIXON (1934). With few exceptions *Elasmosoma* species have been found in association with formicine ants; these ants exude formic acid which is a powerful attractant for predatory ant species (B. BOLTON, personal communication) and it seems likely that this exudate could serve also as a kairomonal stimulant to host-seeking by *Elasmosoma*.

No one has yet succeeded in rearing *Elasmosoma* in circumstances which show unequivocally that the parasite develops in adult worker ants; their habit of approaching ants however, seems strongly to suggest that this is so. PIERRE (1893) wrote that the parasite always approaches the ant from behind, probably a necessary precaution since he also states that the ants appear to be aware of the presence of the parasite. If the orientation of the ant be propitious — if it still has its back turned — the *Elasmosoma* then makes a brief contact with the abdomen of the ant during which time PIERRE supposed that oviposition occurred. DR. R. D. HARKNESS recently made similar observations when he took *E. platamonense* in Greece. The parasite approached from behind the ant and remained in contact with the tip of the abdomen for less than one second (personal communication). The form of the ovipositor in *Elasmosoma* — strongly curved, almost hook-shaped, and forward-pointing when exerted — gives support to the supposition that eggs are laid as described, into the gaster of adult workers. Parasites of other groups (*Pygostolus*, for instance, a parasite of weevils) which are known to lay their eggs in the abdomen of the host adult usually by inserting it through the anus have an ovipositor of a similar shape and disposition. It is significant that HARKNESS

\*Ergebnisse der zoologischen Forschungen von DR. Z. KASZAB in der Mongolei, Nr. 365.

noted the contact of the parasite with the worker ant to be at the tip of the gaster of the latter, where the anus is sited. It is perhaps, no surprise that these parasites should be so uncommon. Formicine ants kill sickly members of their nest and spray them copiously with formic acid so that parasitised individuals would thereby be eliminated and with them the parasite.

**Depositories:** BMNH — British Museum (Natural History), London. HNHM — Hungarian Natural History Museum, Budapest. NHM — Naturhistorisches Museum, Maastricht. USNM — United States National Museum, Washington DC.

**Acknowledgements** — I wish to thank Mr. R. D. EADY for guidance during the course of this project. I wish also to thank DR. J. PAPP for his kindness in allowing me full use of the KASZAB collection even though he had begun work on the collection himself, DR. P. M. MARSH for arranging loans of material from the USNM collection and the following for their ready help in response to my requests for material or information: DR. C. VAN ACHTERBERG; Mr. B. BOLTON; DR. F. N. DINGEMANS-BAKELS; DR. M. FISCHER; Mr. G. E. J. NIXON; Mr. C. VARDY.

### Key to genera of Neoneurinae

1 (2) Radial cell complete, the radius distinct to the wing margin (Fig. 1); antennae 16-segmented, distinctly longer than head and thorax together; first tergite of gaster longer than broad, the tergite contracted behind the spiracles

*Neoneurus* HAL

2 (1) Radial cell incomplete, the radius largely obsolete (Fig. 2); antennae ♀ 13-segmented, ♂ 14–15-segmented, shorter than head and thorax together; first tergite of gaster at most as long as broad and expanded behind the spiracles

*Elasmosoma* RUTHE

### *Elasmosoma* RUTHE

*Elasmosoma* RUTHE, 1858: 7. Type species *Elasmosoma berlinense* RUTHE, by monotypy. *Paramirax* ASHMEAD, 1895: 281. Name first published as a synonym (unavailable).

♀. Head large, transverse. Eyes large, protuberant, the ventral facets larger than the dorsal facets. Malar space short. Clypeus short, its distal margin concave; labrum exposed, mandible narrow, curved, bidentate; maxillary palpi 2-segmented, labial palpi 1-segmented, very short. Antenna 13-segmented short, stout. Wing venation largely obsolete except for the strong thick costa only the proximal parts of the radius (2s + proximal part of Rs) and Rs + M remain at all distinct. Pterostigma broad with a pouch-like fold at the anterior edge. Tarsi slender, tapering towards apex, claws minute. One hind tibial spur elongate. Gaster sessile, flattened dorsally, margined laterally and with a prominent ventral keel. Tergites with coriaceous microsculpture which is strongest on tergites 1–3. First tergite never longer than broad the remaining tergites almost always strongly transverse. Hypopygium usually bifurcate.

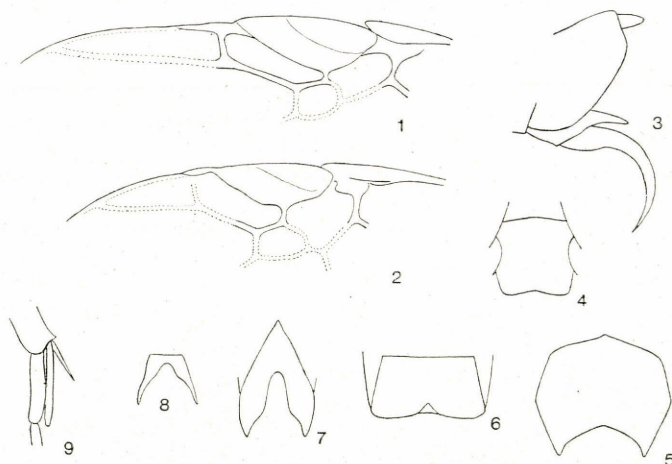
♂. As female except that eyes smaller and less protuberant, malar space correspondingly longer. Antenna longer 14–15-segmented, spurs of hind tibia never longer than basal segment of tarsus.

The following key to species is based upon females and little account is taken of the males because the material available is not sufficient reliably to associate the sexes in most of the species. As is usual in the Hymenoptera the females exhibit the more useful characters.

Key to species of *Elasmosoma* (♀ ♀)\*

- 1 Ocellar triangle obtuse, the distance between the hind ocelli about twice the distance between a hind ocellus and the eye; antennal segments 3-4 at most as long as broad; tarsus of foreleg distinctly longer than tarsus of middle leg . . . 2
- Ocellar triangle more or less right-angled, the distance between the hind ocelli about equal to the distance between hind ocellus and eye; antennal segments 3-4 distinctly longer than broad; tarsus of foreleg distinctly shorter than tarsus of middle leg . . . . . 3
- 2 Propodeum viewed from above about twice as broad as long; hind tibial spur stout, slightly shorter than basal segment of tarsus; face about 1.5 times as long as broad; basitarsus of middle leg only about 1.5 times as long as following segment. Mongolia *cubiceps* sp. n.
- Propodeum viewed from above about five times as broad as long; hind tibial spur (Fig. 9) stout, slightly longer than basal segment of tarsus. Face about as long as broad; basitarsus of middle leg at least two times as long as following segment (usually about three times in ♀ ♀). S. Europe, N. Africa  
*platamonense* sp. n.
- 3 Gaster elongate, conspicuously longer (1.5-2 times) than head and thorax together, strongly compressed though flattened dorsally; tergite 3 at least as long as broad. N. America *schwarzi* ASHMEAD
- Gaster at most equal in length to head and thorax together; tergite 3 always conspicuously broader than long . . . . . 4
- 4 Ocelli large, the distance between hind ocellus and eye less than two times diameter of hind ocellus. N. America *petulans* MUESEBECK
- Distance between hind ocellus and eye at least two times diameter of hind ocellus . . . . . 5
- 5 Hind tibial spur longer than hind basitarsus; first tergite of gaster conspicuously broader apically than long; gaster at most as long as thorax, hypopygium (fig. 8) arising at about the middle of the gaster. N. America *vigilans* COCKERELL
- Hind tibial spur at least slightly shorter than hind basitarsus; first tergite of gaster as broad apically as long. Gaster as long as thorax and head, hypopygium arising in the distal third of the gaster . . . . . 6
- 6 Hypopygium deeply notched distally (figs. 3, 7). Germany, Mongolia  
*berolinense* RUTHE
- Hypopygium shallowly emarginate distally, flat, polished and punctate . . . . 7
- 7 Maximum breadth of hypopygium (fig. 6) twice its length, the apical margin heart-shaped with a prominent fringe of stout hairs which are almost equal in length to the hypopygium. Luxembourg *luxemburgense* WASMANN.
- Maximum breadth of hypopygium about equal to its length, the hairs along the apical margin never longer than half the length of the hypopygium and usually conspicuously less than this . . . . . 8

\**E. bakeri* ASHMEAD not included - based solely on males



Figs. 1-9. — Figs. 1-2: Radial cell of forewing: 1 = *Neoneurus*, 2 = *Elasmosoma*. — Fig. 3. *Elasmosoma berlinense* RUTHE ♀: apex of gaster, lateral. — Figs. 4-8. Hypopygium in ventral view: 4 = *E. lindae* sp. n., 5 = *E. pergandei* ASHM., 6 = *E. luxemburgense* WASMANN, 7 = *E. berlinense* RUTHE, 8 = *E. vigilans* COCK. — Fig. 9. *E. platamonense* sp. n. ♀: hind tibial spurs and basal segment of tarsus.

8 Hypopygium (fig. 4) narrow, not projecting beyond the sides of the gaster and with only a shallow central emargination of the apex. Gaster completely black. Mongolia *lindae* sp. n.

— Hypopygium (fig. 5) broad, projecting beyond the sides of the gaster and with a moderately deep, broad emargination of the apex. Gaster most usually with tergite 2 and at least the base of tergite 3 yellow. N. America, Mongolia *pergandei* ASHMEAD

#### *Elasmosoma bakeri* ASHMEAD

*Elasmosoma bakeri* ASHMEAD, 1895: 282. Holotype ♂ USA; Colorado, Fort Collins, C. F. BAKER (USNM 23983) (examined).

MUESEBECK (1922: 6) supposed this species to be the male of *E. vigilans* COCKERELL but declined to synonymise them because he had been able to examine so little material.

#### *Elasmosoma berlinense* RUTHE

*Elasmosoma berlinense* RUTHE, 1858: 7. 10 syntypes 5 ♂ and 5 ♀ (?) Germany: Berlin, J. F. RUTHE; one ♂ syntype BMNH (examined).

RUTHE stated that his syntypic series consisted of five males and five females. His description and figure best fit the male — he makes no mention of 13-segmented antennae for instance, but both describes and illustrates the longer 14-segmented antenna characteristic of the male. It seems likely that having a series of 10 males RUTHE correctly identified the sex of those in which the genitalia were extruded, and assumed to be female those males whose genitalia were hidden (1858: 8). I have been able to locate only one specimen of this series — a male in the collection of BMNH labelled in RUTHE's handwriting, "*Elasmosoma berlinensis* (sic) m. n. gen. n. sp.". This specimen has been labelled in the BMNH as the holotype of *berlinense* and has been catalogued as such by SHENEFELT (1969: 138) who mistakenly listed it as female. I have based my concept of the species upon that male and males and females associated with it, but in the hope that

RUTHE's syntypic series included a female and that this may be found I am not here designating this male syntype as lectotype. The hypopygium of *berolinense* is deeply divided at the apex and in the specimens examined it is characteristically folded in the mid-line (fig. 3).

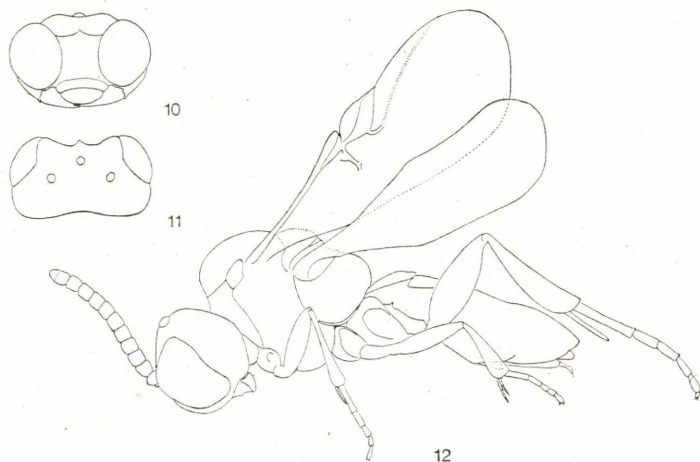
Material examined — ♀ B a v a r i a: Obersdorf, Spielsmannsau, Aug. 1936, G. NIXON (BMNH). — M o n g o l i a, Chentey aimak: zwischen Somon Cenchermandal und Somon Žargaltchaan, 10 km O von Cenchermandal, 1400 m, 27–28. VII. 1965 (Nr. 311) (HNHM); 7 km NO von Somon Mörön, 1200 m, 28–29. VII. 1965 (Nr. 319) (HNHM). Zavchan aimak: 44 km OSO von Somon Tes, 1620 m, 23. VI. 1968 (Nr. 1005) (HNHM). Uvs aimak: Südrand des Sees Örög nuur, 1500 m, 28. VI. 1968 (Nr. 1036) (HNHM).

♂ No locality (? G e r m a n y): RUTHE Coll. 59–101, BM Type Hym. 3C. 900. — H o l l a n d: 11. 9. 94 ex. *F. rufa* MARSHALL Coll. 1904–120; Same data except for date 18. 9. 95 (both BMNH). — M a c e d o n i a: Prespa Geul, Otesevo 9–21. VI. 1955. R. L. COE (2 specimens same data) (BMNH). — B u l g a r i a: Küstendil, leg. BIRÓ, 1928 (HNHM). — M o n g o l i a, Suchebaator aimak: 44 km SSW von Baruun urt, 1050 m, 2–3. VIII. 1965 (Nr. 349) (HNHM); Bajanchongor aimak: Oase Echin gol, cca 90 km NO vom Grenzposten Cagaanbulag, 950 m, 27–28. VI. 1967 (Nr. 855) (HNHM); Uvs aimak: 10 km NW von Somon Naranbulag, 1350 m, 9. VII. 1968 (Nr. 1082) (HNHM); Bulgan aimak: 11 km W von Somon Bajannuur, am Südrand des Sees Bajan nuur, 1000 m, 24. VII. 1968 (Nr. 1145) (HNHM), Exp. KASZAB.

Host records: *Formica rufa* L., *F. sanguinea* LATR., *F. fusca* L., *F. pratensis* RETZIUS, *Lasius niger* (L.), *Camponotus* sp., *Polyergus* sp.

#### *Elasmosoma cubiceps* sp. n. (Figs. 10–12)

Head large, slightly broader than thorax. Frons, vertex, temples, and occiput with coriaceous microsculpture, the temples, vertex and occiput punctured and with a moderate covering of short, white hairs. Face protuberant, its length (from the distal margin of the clypeus to the antennal bases) about 1.5 times its breadth (the least distance between the eyes); face and clypeus rather dull granular coriaceous and with copious white pubescence. Distal margin of clypeus concave, labrum prominent, shining and punctate. The distance between bases of mandibles distinctly greater than half the width of head. Eyes large and protuberant, the ventral facets exceptionally large, conspicuously larger than the small dorsal fa-



Figs. 10–12. *Elasmosoma cubiceps* sp. n.: 10 = head, anterior, 11 = head, dorsal, 12 = whole insect, lateral.

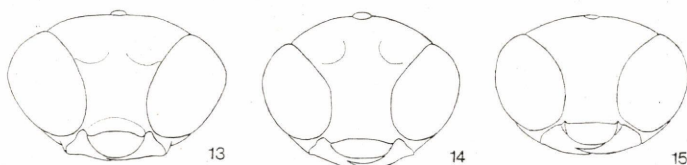
cets. Malar space very short. Tentorial pits well marked. Ocelli large, the ocellar triangle obtuse, the distance between the hind ocelli two times the distance between hind ocellus and eye. Distance between hind ocellus and eye less than two times width of hind ocellus. *Antennae* 13-segmented, the two terminal segments not distinctly divided, the two basal segments broader than long the rest quadrate except for the terminal segment which tapers. — *Pronotum* and mesopleurum coriaceous, the mesopleurum hairy; mesonotum with a moderate covering of short white hairs; coriaceous microsculpture between distinct punctures. Scutellum coriaceous. — *Propodeum* strongly reticulate-coriaceous with white hairs. Propodeum not distinctly areated. Middle leg shorter than foreleg; the basitarsus of middle leg shorter than the tibial spine and only about 1.5 times as long as tarsal segment 2. Inner spur of hind tibia stout, blunt and only slightly shorter than basal segment of tarsus. All legs finely punctured and with a moderate covering of short, white hairs the hind coxa coriaceous, at least basally. — *Gaster* as long as head and thorax together; first tergite broader distally than long, second and third tergites twice as broad as long. Tergites 1–6 with strong reticulate-coriaceous sculpture but only sparsely haired. Hypopygium short, distally slightly emarginate and remote from the apex of the gaster by about its own length. — *Wings* hyaline. Costa of fore wing thickened. Stigma wide and reflexed anteriorly into a pouch-like fold; costa and stigma finely regularly punctate and hairy. Remaining veins largely obsolete. — *Colour* black, the antennae brown except for the two basal segments which are lighter beneath. Face, clypeus, mandibles and legs pale yellow in colour, the hind coxae infuscate and sometimes the hind tibia and tarsus infuscate apically. Costal vein and stigma testaceous. — Length 1.75 mm.

*Holotype* ♀: Mongolia, Mittelgobi aimak: Choot bulag, zwischen Somon Chuld und Somon Delgerchangaj, 38 km ONO von Delgerchangaj, 1480 m, 10. VI. 1967 (Nr. 782) (HNHM), Exp. KASZAB. — *Paratype* ♀: same data (BMNH). — ♂♂ unknown.

This species may be readily recognised by the extreme shortness of the tarsus of the middle leg and by the length of the tarsal segments relative to each other. The disposition of the ocelli is also unusual being found only in one other known species *E. platamonense* sp. n.

#### *Elasmosoma lindae* sp. n. (Figs. 4, 14)

♀. *Face* and clypeus rugose with a strong transverse strigose element and scattered punctures; frons, vertex reticulate-coriaceous with transverse strigose element particularly upon vertex between and around ocelli. Clypeus emarginate apically but produced at the sides into two broad points. Antenna 13-segmented. — *Mesonotum* reticulate-coriaceous with, posteriorly, a strong rugose element, the scutellar disc distinctly reticulate rugose, the lateral areas of the scutellum and the metanotum canaliculate the two areas divided by a smooth, highly-polished band. The mesopleurum reticulate-coriaceous with a distinct rugose element. Tegula regularly punctate; immediately below the tegula there is a prominent swelling of the mesopleurum bordered beneath by a crenulate depression with rugae and foveolae. *Propodeum* in profile sharply angled, divided into dorsal and posterior faces by a strong transverse carina which is produced laterally to form small crests, strong rugae project from the carina and between them



Figs. 13-15. Head, anterior, ♀: 13 = *E. platamonense* sp. n., 14 = *E. lindae* sp. n., 15 = *E. pergandei* ASHM.

there is distinct reticulate-coriaceous microsculpture. — Gaster is as long as head and thorax together, tergite one as broad as long the remainder transverse, tergite one and two and the base of three strongly reticulate-coriaceous the remaining tergites less strongly sculptured. The hypopygium is about as broad as long, broadly but narrowly emarginate apically, not projecting beyond the sides of the gaster. Hypopygium (fig. 4) flat centrally, not folded, thick, with a slight transverse fold just before the apex, shining and moderately punctate with an apical fringe of short hairs — the longest in clumps on the lateral lobes. — Colour black, labrum, mandibles and legs yellow, tegula, costa and pterostigma of the wing brown.

♂. Same as female except that the antennae are longer and thicker the eyes smaller, the frons more heavily strigose and the first tergite of the gaster rugose. The colour is generally darker, the labrum black, mandibles and legs testaceous and somewhat infusate.

Holotype ♀: Mongolia, Bulgan aimak, 30 km NNW von Somon Daschinčilen, 1200 m, 15. VI. 1968 (Nr. 959) (HNHM). — Paratypes: Mongolia, 2 ♀ same data as holotype (one ♀ in BMNH one in HNHM); 1 ♀, Čojbalsan aimak, 15 km N von Somon Galuut, 850 m, 17. VIII. 1965 (Nr. 433) (HNHM); 1 ♀, Archangaj aimak, Changaj Gebirge, 8 km W von Somon Urdtamiir, 1620 m, 19. VI. 1966 (Nr. 538) (HNHM). — ♂, Uvs aimak, Sandgebiet Altan els, 35 km WNW von Somon Tes, 1400 m, 23. VI. 1968 (Nr. 1007) (HNHM), Exp. KASZAB.

Host unknown.

This species is extremely close to *E. pergandei* ASHM. and to *E. luxemburgense* WASM. It can be distinguished from both by the characteristics of the hypopygium given in the key to species. *E. lindae* is more strongly sculptured on the head and mesopleurae than either *pergandei* or *luxemburgense*. In most specimens of *pergandei* there is no trace of a transverse carina on the propodeum which is evenly rounded in profile. In those specimens of *pergandei* which have a transverse carina on the propodeum it is less strongly developed than in *lindae* and the propodeum in profile is not as sharply angled. The clypeus (Fig. 14) of *lindae* is more distinctly emarginate than that of *pergandei* which has an almost straight apical border. The face of *lindae* is slightly broader between the eyes than that of *pergandei*.

#### *Elasmosoma luxemburgense* Wasmann

*Elasmosoma luxemburgense* Wasmann, 1909: 168. 2 syntypes ♀ Luxembourg: Wasmann, 29. 7. 07 (NHM) (examined). Syntype ♀ Luxembourg: Wasmann July 1904 (NHM) (not examined).

I have not been able to find the formal description of this species which Wasmann (1909: 168) evidently intended to publish. In this same paper (1909), however, there is sufficient information upon the species to validate the name according to the provisions

of the International Code of Zoological Nomenclature. I therefore regard *luxemburgense* as a valid nominal species.

This species very closely resembles *E. pergandei* ASHM. from which it may be distinguished by the characteristics of its hypopygium. In *luxemburgense* the hypopygium is broad but relatively short, shining and punctate with extremely long hairs. The apex of the hypopygium is slightly emarginate and with a small triangular membranous area centrally. The propodeum is reticulate-coriaceous between prominent rugae, with a strong but irregular transverse carina. The colour pattern of the gaster is similar to *pergandei* with tergite 2 and the base of tergite 3 yellow. The two specimens examined are mounted on separate card points on the same pin. I designate as lectotype the specimen on the top mount.

2 ♀: Luxemburg, 29.7. 07. *F. rufibarbis*, WASMANN (NHM).

Host record: *Formica rufibarbis* FABRICIUS (determination confirmed by B. BOLTON).

#### *Elasmosoma pergandei* ASHMEAD

*Elasmosoma pergandei* ASHMEAD 1895: 283. Holotype ♀, USA: Washington, DC. T. PERGANDE, 29. V. 1895 (USNM, 23985) (examined).

This appears to be the most widespread species of *Elasmosoma*. The most characteristic feature of *pergandei* is the hypopygium (fig. 5) which is long, broad, shining and punctate with a marginal fringe of hairs. The depth of the emargination at the apex of the hypopygium varies slightly; the hypopygium in the six female specimens from McHenry Co., ND, appears to be thinner and the emargination of its apex slightly deeper than that of typical *pergandei*. These differences are insufficient to justify the separation of the six specimens as a new species, they must therefore remain atypical *pergandei* until enough material is available for their true position to be determined with confidence. The length of the hair fringe also varies slightly — possibly due to wear. In mounted specimens the hypopygium of *pergandei* is almost invariably flat and projects beyond the sides of the gaster whereas in most other species the structure frequently dries in the folded position.

It is scarcely conceivable that two series, one of conspecific males the other of conspecific females, taken over at the same period of time in the same malaise trap, should be of different species. The series of three males from McHenry Co. ND., must therefore be regarded as the hitherto unknown male of *pergandei*. If the female series is found eventually to be distinct from *pergandei* the males of course will fall into the new species which it will then be necessary to erect.

♀♀ USA: Moorestown, NJ., VI. 7. 37., R. T. WHITE (BMNH) Chelan, Wash., 5. 30. 41, H. W. PRESCOTT; Colo. 2175, coll. C. F. BAKER; McHenry Co. ND., Sec. 36, T. 156, R. 78, in a Malaise trap on the following dates — 27. V.—3. VI. 1969 (two specimens), 6—11. VII. 1969, 11—17. VII. 1969 (two specimens), 29. VIII.—2. IX. 1969. (USNM). — Mongolia, Bajanchongor aimak: Talyn Bilgech bulag, Quelle zwischen Tost ul und Cagaan Bogd ul Gebirge, 1200 m, 23. VI. 1967 (Nr. 838) (HNHM); Oase Echin gol, cca 90 km NO vom Grenzposten Cagaanbulag, 950 m, 27—29. VI. 1967 (Nr. 857) (HNHM), Exp. KASZAB. ♂♂ USA: McHenry Co. ND., Sec. 36, T. 156, R. 78, 3—11. VI. 1969, 11—18. VI. 1969, 22—24. VII. 1969 (USNM).

Host records: *Formica fusca* var. *subsericea* SAY, *Formica rufa integra* NYE, *Campopnotus castaneus* (LATR.).

#### *Elasmosoma petulans* MUESEBECK

*Elasmosoma petulans* MUESEBECK, 1941: 200. Holotype ♀, USA: Ohio, Jackson, L. G. WESSON, 15. VII. 1938 (USNM, 55665) (not examined).

I have seen one of the female paratypes of this species — it is as MUESEBECK has described save that the first tergite of the gaster is distinctly broader distally than long.

Paratype ♀, USA: Ohio, Jackson, L. G. WESSON, 15. VIII. 1938 (USNM); USA: Wyoming GTNP Moose Island, 6700' Aug. 15th. 1964, J. CUMMINGS "Alighting on anus of *Formica opaciventris*" (USNM).

Host record: *Formica sanguinea rubicunda* EMERY.



*Elasmosoma platamonense* sp. n. (Figs. 9, 13)

♀♀. Head (Fig. 13) large, breadth across eyes at least equal to breadth of thorax; face short, protuberant with indistinct coriaceous sculpture and copious white hair. Tentorial pits well marked; clypeus inflexed, distal margin concave; labrum prominent visible between clypeus and mandibles shining and punctured with copious white hairs. Frons abruptly divided from face, rather flat with strong coriaceous sculpture. Antenna short, stout, 13-segmented but the last two segments not distinctly divided, the four basal segments broader than long the rest quadrate except for the terminal segment which tapers. Ocelli large, the ocellar triangle obtuse, the distance between the hind ocelli at least 2.5 times the distance between hind ocellus and orbit. Eyes large converging below, malar space very short. The distance between the bases of the mandibles about half the breadth of the head. — Thorax short, anteroposteriorly compressed, the thorax in lateral view about as high as long. Anterior face of propleurum shining with scattered punctures and with distinct rugae laterally, the lateral face of the propleurum coriaceous. The propleurum has a ventro-lateral pyriform swelling just in front and above the base of the fore coxa giving the appearance of a triangular tooth on each side of the thorax when viewed from above. The pronotum coriaceous with traces of longitudinal striation. The mesonotum strongly convex, coriaceous with copious white hair. Mesopleurum with reticulate-coriaceous sculpture; scutellum coriaceous with scattered large punctures and with vertical striation at the sides the scutellar disc strongly convex. The metanotum with strong striations laterally and prominently swollen centrally to form a distinct postscutellar elevation. Propodeum short and wide, somewhat swollen at the sides, recessed beneath the scutellum. Propodeum with strong reticulate-rugose sculpture centrally with a transverse strigose element at the base and with copious long white hairs on the lateral swellings. — Tarsus of middle leg shorter than tarsus of foreleg, tarsal segments 3–4 of middle leg quadrate, basitarsus of middle leg at least two times as long as second segment of tarsus. Basitarsus of foreleg distinctly curved. Outer tibial spur of hind leg (Fig. 9) stout and blunt, slightly longer than basal segment of tarsus. — Venation mostly obsolete, the base of the radius distinct the costa thick the pterostigma broad and reflexed anteriorly into a pouch-like fold. — Gaster as long as head and thorax together. First tergite broader at apex than long the other tergites much broader than long. Tergites 1–3 strongly coriaceous with scattered punctures and hairs the rest indistinctly coriaceous more densely punctured and hairy. Hypopygium broadly and shallowly emarginate ending well before the end of the gaster. — Black, antenna brown except that the two basal segments are testaceous below. Face clypeus, labrum, mandibles, legs, tegula, costa and stigma ivory in colour, the stigma with a fuscous border. The hind coxa mainly black dorsally the middle coxa also sometimes darker.

♂♂. Same as females except that antenna 14–15 segmented longer and somewhat expanded centrally. The hind tibial spurs both shorter than the basal segment of the tarsus and not stout and blunt. The distance between the hind ocelli 3.5 times the ocellar-ocular distance. The eyes smaller and the malar space longer. The colour darker, the face and clypeus black.

Holotype ♀: Greece, Platamon, Aug. 1974 (Dr. R. D. HARKNESS) (BMNH).  
— Paratypes ♀: Greece, Platamon, Aug. 1969 (Dr. R. D. HARKNESS) (HNHM).  
— ♀, Greece Platamon 12. Aug. 1973 (Dr. R. D. HARKNESS) (BMNH). — ♀, Egypt,

Helwan, 30. X.-5. XI. 1944, R. L. COE (BMNH). — ♂, Spain, (Murcia): Near Aquilas' 27. VI. 1974, Z. BOUČEK (BMNH). ♂ Same data (USNM).

Host record: *Cataglyphis bicolor* (FABRICIUS)

Although collected in different localities from the females, I associate these males with them because of the close resemblances in their facies and their common possession of the obtuse ocellar triangle which is exhibited, albeit to a lesser degree, by only one other species, described above (*cubiceps* sp. n.). The differences in the antennae, the eyes and the hind tibial spurs are almost certainly secondary sexual characteristics.

*E. platamonense* sp. n. is closely related to *E. cubiceps* sp. n., both have features in common which appear in no other species; the obtuse ocellar triangle, the relative shortness of the middle leg, the thick blunt spine of the hind tibia (Figs. 9, 12 and the colour pattern. Both species clearly belong in the genus *Elasmosoma* as I understand it probably constituting a distinct species-group.

#### *Elasmosoma schwarzi* ASHMEAD

*Elasmosoma schwarzi* ASHMEAD, 1895: 283. Holotype ♀, USA: Washington, DC. (USNM, 23984) (examined).

The characteristics of its gaster make this species quite distinctive. I have seen one specimen apart from the type; the gaster of this specimen is less elongated than that of the type specimen, I believe that the difference can be accounted for as differences in the flexion of the gasters and in the stretching of the intersegmental membranes.

♀, USA: Pennsylvania, Hebersburg, VIII. 1939, Mrs. L. E. SHINN (USNM).

Host records: *Formica pallidefulva schaufussi* MAYR, *Polyergus lucidus* MAYR.

#### *Elasmosoma viennense* GIRAUD

*Elasmosoma viennense* GIRAUD 1871: 301.

As shown by BENGTSOON (1918) this species properly belongs in the genus *Neoneurus*.

#### *Elasmosoma vigilans* COCKERELL

*Elasmosoma vigilans* COCKERELL, 1909: 168. Holotype ♀ USA: Colorado, Boulder (USNM, 23130) (examined).

I have seen only the type of this species. Unfortunately the hind legs are missing; they were presumably present in 1941 when MUESEBECK observed the hind tibial spur to be longer than the basal segments of the tarsus in *vigilans*. The hypopygium of this species is deeply notched.

Host record: *Formica subpolita* MAYR.

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