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FOUR NEW SPECIES OF EULOPHIDAE (INSECTA, HYMENOPTERA)
FROM MADEIRA AND EUROPE

By M. W. R. de V. Graham *

With 3 figures

SUMARIO. Este trabalho é um relato sobre alguns himenópteros calcidóides colhidos principalmente na Madeira pelo autor e sua mulher em 1980, 1982 e 1985. Descreve-se as seguintes espécies novas para a ciência: *Necrernnus alticola*, *Aprostocetus nubigenus*, *Neotrichoporoides dispersus*. *N. mediterraneus*.

During our recent visit to Madeira in July-August 1985 my wife and I found two species of Eulophidae (Hymenoptera, Chalcidoidea) which are new to science. On previous visits we had taken two other new species. All four are described in the present paper.

We offer our thanks to Mr. G. E. Maul and Dr. Manuel Biscoito (Museu Municipal do Funchal), Mr. Henrique Costa, Neves (Serviços Florestais) and Dr. Francis Zino (Funchal), all of whom gave us invaluable help in various ways during these visits.

In descriptions of antennae the abbreviations F1, F2, F3, F4 stand for first, second, third and fourth funicular segments; C1, C2, C3 for the first, second and third claval segments. BMNH stands for British Museum (Natural History), ITZ for Instituut voor Taxonomische Zoologie, Amsterdam.

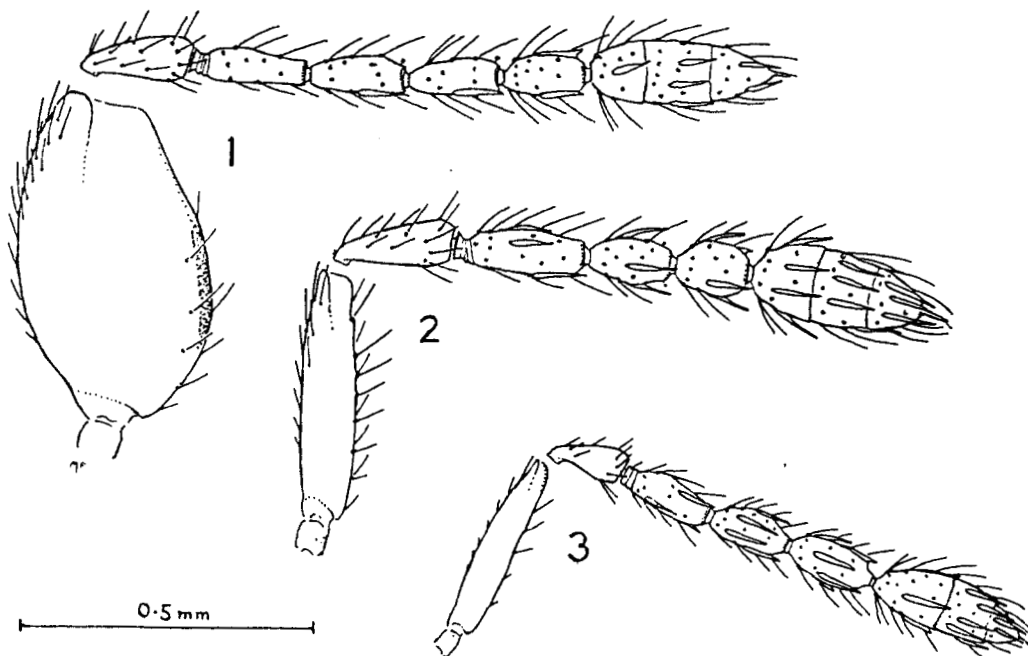
* Salisbury Crescent, Oxford OX2 7TJ, UK.

Necremnus alticola sp. n

(Fig. 3)

♀. Antenna (Fig. 3) with scape reaching above the vertex; combined length of pedicellus and flagellum about 1.5 times breadth of mesoscutum; pedicellus twice as long as broad or hardly more, about as long as first funicular segment; funicle rather slender, not stouter than pedicellus, its segments equal in length; clava about 3 times as long as broad and slightly shorter than funicular segments two plus three, first claval segment about 1.5 times as long as broad and occupying nearly half the total length, second and third segments much shorter. Thorax not strongly arched, propodeum sloping at about 45° to plane of mesoscutum and scutellum. Propodeum rather more distinctly reticulate than in *tidius* (Walker) and less shiny; spiracles short-oval, separated by about one third their length from hind edge of metanotum. Gaster ovate, acute, not quite as long as head plus thorax, about twice as long as broad; last tergite slightly broader than long. Length 1.3 mm.

Antennae brownish-testaceous with scape medially and pedicellus proximally, infusate. Dorsal surface of body bronze with very weak greenish tinge in places. Coxae black; about basal half of fore and mid femora fuscous, basal three quarters of hind femora blackish; tibiae



Figs. 1-3. — 1, *Aprostocetus nubigenus* sp.n., ♂, antenna; 2, The same, ♀, antenna; 3, *Necremnus alticola* sp.n., ♀, antenna.

testaceous; fore tarsi brown, mid and hind tarsi with basitarsus testaceous, second segment hardly darker, third slightly brownish, fourth brown. Tegulae brownish. Forewing with a slight infumation over the middle third, but not forming distinct markings.

♂. Unknown.

Holotype ♀ : Madeira, massif of Lombada das Vacas, 11.viii.1985 (M. de V. Graham) in BMNH.

N. alticola most resembles the European species *N. tidius* (Walker) but differs in having propodeal spiracles not touching the hind margin of the metanotum; antennal flagellum more slender, its segments equal in length; clava with first segment relatively longer; antennae and tibiae paler (in *tidius* the antennae are black and the tibiae mainly so). It resembles the Madeiran species *N. fumatus* Graham (1983) in the position of its propodeal spiracles, but differs in having a much shorter gaster, slightly stouter antennal funicle, third segment of funicle and first segment of clava relatively shorter; antennae paler, tibiae not infuscate, forewing only weakly infumate.

***Aprostocetus nubigenus* sp. n.**

(Figs 1, 2)

♀. Structurally very similar to the ♀ of *flavifrons* [Walker] to which it appears closely related. It differs as follows.

Head very slightly broader than mesoscutum. Antenna (Fig. 2) with scape longer, 0.9-1.0 times length of an eye, reaching slightly above the vertex. Mesoscutum tending to be rather more shiny, its sculpture more delicate, nearly obsolescent. Submarginal vein of forewing with 2-3 dorsal setae (one ♀ has 4 setae on the left forewing only). Antenna testaceous with clava brownish and about proximal half of scape blackish. Body black, non-metallic, with restricted yellowish markings as follows: inner and outer orbits, vertex except ocellar triangle, mouth-edge, genae and lower part of temples, a transverse band on face at level of antennal toruli; a large spot on each side of pronotum, the prepectus, upper angle of mesopleuron, a triangular spot in each anterior angle of mid lobe of mesoscutum, two small spots on hind edge of this sclerite, scapulae except an anterior spot, a roundish spot on the inner edge of each axilla, a pair of spots on last tergite of gaster, in one specimen also a pair on penultimate tergite and in another, a pair on each of the three posterior tergites. Legs testaceous with fore coxae in two specimens more or less black proximally, mid coxae blackish proximally, hind coxae black except apically; pretarsi and claws fuscous; in two specimens the fore femora have a black streak externally and the hind femora are broadly black medially. Tegulae and wing-venation yellowish; forewings slightly yellowish-tinged discally. Length 1.8-1.9 mm.

The ♀ of *flavifrons* has the head slightly less broad than, or at most as broad as, the mesoscutum; antennal scape 0.85-0.87 length of

eye, not quite reaching the vertex; mesoscutum rather less shiny, its sculpture usually a little stronger; submarginal vein with 3-4 dorsal setae.

♂. Similar in structure and colour to the ♂ of *flavifrons* (Walker) except in its antennae. Antenna (Fig. 1) with scape about 1.3 times as long as an eye, reaching well above vertex, swollen and like a flattened bladder, about 1.7 times as long as broad, with ventral plaque linear and extending over about middle third of scape; pedicellus plus flagellum about 1.4 times breadth of mesoscutum; pedicellus slightly longer than F1 and about 2.5 times as long as broad; funicle proximally less stout than the pedicellus but thickening slightly distad, its segments decreasing very slightly in length, F1 2.8-3.3 times, F2 2.0-2.25 times, F3 1.7-2.0 times, F4 1.65-1.9 times as long as broad; clava distinctly broader than F4, somewhat longer than F3 plus F4, 2.8-3.2 times as long as broad, pointed; flagellum lacking compact whorls of long setae but clothed with shorter dark setae, the length of which about equals the breadth of the segments that bear them. Characters of head, mesoscutum and forewing as in ♀. Gaster elliptic, about as long and as broad as thorax. Colour as in ♀ but scape brownish-testaceous; whole of genae and temples yellowish; mesoscutum yellowish with a large triangular anterior black mark.

The ♂ of *flavifrons* has the antennal scape slightly shorter than an eye and not reaching above the vertex, not swollen and about 2.5 times as long as broad, its ventral plaque short and placed wholly in the upper half of the scape; pedicellus plus flagellum about 1.2 times breadth of mesoscutum; pedicellus about twice as long as broad. The yellow colour of the body tends to be more restricted than in *nubigenus*, the thorax being sometimes wholly black.

Holotype ♂: Madeira, Balcões de Ribeiro Frio, 21.viii.1985 (Mrs. E. M. Graham) in BMNH.

Paratypes: Balcões de Ribeiro Frio, 21.viii.1985, one ♂, two ♀♀; Fajã da Nogueira, 24.vii.1985, one ♀; between Queimadas and Caldeirão Verde, 13.viii.1985, one ♀, in author's collection.

Neotrichoporoides dispersus sp. n.

Tetrastichus sp. near *viridimaculatus* (Fullaway); Graham, 1981 : 18

♀. Differs from ♀ of *viridimaculatus* (Fullaway) as follows. Mesoscutellum with submeclian lines superficial but traceable throughout the length of the sclerite or at least over the greater part of it; surface rather less shiny, its reticulation more distinct and tending to be slightly raised.

Eody less extensively dark-marked, yellow or ochraceous with the following parts black and metallic-tinged: a mark on upper part of frons, two spots on neck region of pronotum, sometimes joined, and a spot surrounding each spiracle; usually an oval spot on mid lobe of mesoscutum anteriorly, and usually a small one on anterior part of each scapula; a

spot on each axilla anteriorly; a longitudinal stripe down middle of scutellum, not reaching the submedian lines and as a rule not extending to the hind margin, sometimes absent; a longitudinal stripe or spot on each side of propodeum, its outer edge touching the spiracle; usually a small spot on upper part of mesopleuron; two dorsal stripes on the gaster, extending from the base about half way along each lateral edge; often a median spot just beyond middle of gaster; ovipositor sheaths black. Length 1.7-2.6 mm.

♂. Differs from ♀ as follows: eyes slightly smaller; antenna similar to that of *viridimaculatus* (Fullaway) but scape 1.55-1.65 times as long as eye; scape reaching far above vertex, its ventral plaque extending most of its length; pedicellus plus flagellum 3.0-3.5 times breadth of mesoscutum; pedicellus about twice as long as broad and about half length of F1; flagellum proximally slightly stouter than pedicellus, tapering a little distad: F1 slightly shorter than the others, 3.0-3.5 times as long as broad, following segments subequal in length, each 4.0-4.3 times as long as broad; clava not broader than F4, 10-13 times as long as broad, somewhat longer than F3+F4, with C1 4-5 times as long as broad and occupying fully one-third the total length, C2 3-4 times as long as broad, C3 somewhat shorter than second, pointed, its spine short; segments of funicle each with whorled setae which project somewhat beyond the tip of the segment that bears them; C1 with two partial whorls, one dorsal and the other ventral, C2 with one ventral partial whorl. Gaster oblong or elliptic, slightly shorter and narrower than thorax; convex ventrally, without a plica.

Colour pattern very similar to that of ♀.

Material examined. 13 ♂, 37 ♀. Holotype ♀, Spain: Malaga, Benicassim, between 22 and 24.vi.1974 (Boucek) (BMNH).

Paratypes. Italy: 2 ♀, Sorrento-Meta, 9.vii.1966, 1 ♀, Varazze, near Genoa, 4.ix.1971, 1 ♂, Ceriale near Albenga, 3.ix.1972 (Boucek) (BMNH). Madeira: 1 ♂, 5 ♀, São Martinho, 8.v.1980, 1 ♀, 10.v.1980, 3 ♀, 26.v.1980, 3 ♂, 1 ♀, 18.vii.1982, 1 ♀, 23.vii.1982 (E. M. and M. de V. Graham) (Graham). Sardinia: 1 ♂, 2 ♀, Villasimius, vi.1975 (Boucek) (BMNH). Spain: 3 ♀, Malaga, Estepona, 29-30.vi.1974; 7 ♀, Benicassim, 13-15.vi.1973, 1 ♀, 14.vi.1974, 4 ♂, 2 ♀, 22-24.vi.1974; 2 ♀, Barcelona, Calella de Costa, vi.1971; 1 ♂, Murcia, Sierra de Espuña near Totana, 20.vi.1973; 1 ♀, Alicante, Moraira, 17.vi.1973; 2 ♀, Grenada, Calahonda, 22.vi.1973, 1 ♀, La Herradura, 24.vi.1973, 1 ♂, Nerja, 3.vii.1974 (Boucek) (BMNH). Yugoslavia: 1 ♂, Dalmatia, Basko Polje, near Makarska, 12.viii.1979 (Boucek) (BMNH).

HOST. Unknown, but probably some species of Diptera on coarse grasses. I have swept *dispersus* from *Hyparrhenia hirta* in Madeira.

Neofrichoporoides mediterraneus sp. n.

Tetrastichus sp. near *szelenyii* (Erdos) Graham, 1981 : 18. A very detailed description of this species is given as there are many species closely allied to it, particularly in Africa and Asia.

♀. Head slightly broader than mesoscutum, 2.1-2.2 times as broad as long; temples about 0.08 length of eyes; POL equal to or slightly greater than OOL, OOL about twice OD. Eyes about 1.3 times as long as broad, separated by 1.10-1.25 their length. Malar space about 0.5 length of eye; sulcus with a subtriangular fovea extending 0.33-0.40 length of gena, most often 1.4-1.8 times as long as broad (2.0 times in one ♀). Mouth nearly 1.5 times malar space. Setae of head inconspicuous, the length of those on vertex much less than OD. Antenna with scape 0.8-0.9 length of eye, reaching level of vertex but not or hardly above it; pedicellus plus flagellum 1.55-1.70 breadth of mesoscutum; pedicellus 2.2-2.6 times as long as broad; funicle proximally hardly stouter than pedicellus, thickening very slightly distad; F1 3.0-4.0 times as long as broad and 1.4-1.6 times length of pedicellus, F2 3.0-3.7 times, F3 2.0-2.6 times as long as broad; clava hardly broader than F3, 2.8-3.3 times as long as broad, its length equal to that of F3 plus half to two-thirds of F2, pointed, with C1 1.5-1.8 times as long as broad and occupying about half the total length, C2 much shorter and about as long as broad, spine about 0.35 length of C3, moderately stout, conical, its seta arising before the tip of the spine and equaling it in length; sensilla moderately numerous, slender, subdecumbent with projecting apical blades, averaging three rows on each funicular segment and two on C1 and C2, one row on C3; setae of flagellum short, curved, standing out only slightly. Thorax with pronotum subconical, about half as long as mesoscutum. Mid lobe of mesoscutum rather weakly convex, slightly broader than long, moderately shiny, reticulation extremely fine, engraved, areoles varying from sub-circular to twice as long as broad; median line usually absent, occasionally indicated by a weak depression; 3-5 adnotaular setae on each side, plus an inner row of 1-3, all very short and subdecumbent, except the posterior seta of each outer row, which is nearly as long as the anterior scutellar setae. Scutellum almost or quite as long as mesoscutum, as long as or slightly longer than broad, moderately convex, its reticulation at the sides much like that of mesoscutum, but between the submedian lines slightly wider-meshed except usually at the base: submedian lines very distinct, diverging slightly caudad, slightly nearer to sublateral lines than to each other, enclosing a space 2.0-2.4 times as long as broad; anterior pair of setae weak, their length much less than distance between submedian lines, hardly nearer to submedian than to sublateral lines, posterior pair close to submedian lines and about 1.5 times as long as anterior setae. Dorsellum 2.0-2.7 times as broad as long, hind margin obtusely angulate. Propodeum subrectangular, twice or more than twice

as long as dorsellum, relatively dull, with fine but strong and slightly raised reticulation; median carina distinct, often strongly raised, thin and hardly expanded posteriorly; a deep furrow, and sometimes a row of large foveae, along hind margin of propodeum in front of the ridge which borders the petiolar emargination; spiracles small, subcircular, separated by slightly less than their diameter from metanotum; callus with 3-4 setae. Legs of medium length; hind coxae slightly oblique, hind edge strongly curved, surface moderately shiny, with fine but distinctly raised reticulation; hind femora 3.3-3.5 times as long as broad; spur of mid tibia about 0.5 length of basitarsus, which is 5.0-6.5 times as long as broad and 1.6 times length of second tarsomere, fourth tarsomere about 0.5 length of second. Hind tarsi thicker than mid tarsi, with fourth tarsomere about 0.7 length of basitarsus; the pretarsus relatively larger. Forewing 2.60-2.85 times as long as broad; costal cell 12-17 times as long as broad; SM with 3-5 dorsal setae; M distinctly longer than costal cell, tending to be rather thick proximally but tapering gradually distad, 8.0-9.3 times length of ST, its front edge with 11-15 setae; ST composed mainly of the subtriangular stigma, which has a long uncus; speculum small, wholly or mainly open below, basal vein bare or virtually so; subcubital line of setae extends basad to about level of distal edge of speculum; wing beyond speculum rather densely pilose; cilia somewhat shorter than or as long as ST. Hindwing obtuse or slightly pointed; cilia 0.2-0.3 breadth of wing. Gaster lanceolate, slightly acuminate, slightly to distinctly longer than head plus thorax, 2.0-2.6 times as long as broad; last tergite about as long as broad; hind margins of tergites 1 and 2 distinctly, sometimes strongly, emarginate medially; tip of hypopygium situated at or hardly before half length of gaster.

Head and thorax in European specimens olive- to bright green, or blue-green, in Madeiran specimens at most olive-greenish but often much suffused with bronze; gaster usually olive- or bronze-greenish, sometimes the basal tergite and sides brighter green to blue-green; in Madeiran specimens tending towards mainly bronze; mouth edge narrowly to broadly testaceous or yellow, sometimes also genae, temples and inner orbits. In one ♀ from India which may belong to this species the sides of the pronotum, and the prosternum, are orange-yellow. Antennae black, scape testaceous beneath, or wholly so except dorsally. Coxae concolorous with thorax, fore coxae often partly or wholly testaceous, mid coxae sometimes partly so; legs otherwise testaceous, femora occasionally more or less fuscous-striped, rarely boldly black-striped in basal half. Tegulae yellow, hind edge sometimes brownish. Wings subhyaline, venation yellowish. Length 1.7-2.4 mm.

♂. Malar space 0.52-0.62 length of eye. Antenna with scape 1.08-1.15 length of eye, reaching distinctly above vertex, 3.6-4.1 times as long as broad; ventral plaque 0.75-0.85 length of scape; pedicellus plus flagellum nearly 3 times breadth of mesoscutum; pedicellus about

twice as long as broad; flagellum proximally slightly stouter than pedicellus, but tapering slightly distad; FI very slightly shorter than the others, 1.45-1.85 length of pedicellus and 2.5-2.8 times as long as broad, following segments subequal in length and 3.2-4.0 times as long as broad; clava 9.0-10.5 times as long as broad, at least as long as F3 plus F4 plus half of F2, often nearly as long as F2+F3+F4, its segments subequal in length and separated by strong constrictions, each nearly or quite 3 times as long as broad; spine slender, about 0.25 length of C3. Gaster elliptic, at least slightly shorter than thorax and usually slightly narrower, without a ventral plica: hind margin of tergite 1 (basal) distinctly emarginate medially. Genitalia about 6.5 times as long as broad and slightly more than half length of gaster; aedeagus tapering strongly at tip which is subacute, usually with a small median lobe (rarely 2 small lobes).

Colour similar to that of ♀.

Material examined. 12 ♂, 18 ♀. Holotype ♀, Madeira: São Martinho, 21.v.1980 (Graham) (BMNH).

Paratypes. Canary Is.: 2 ♂, 2 ♀, Gomera, 5 km. NNE of San Sebastián, 500 m, 26.i.1981 (A. C. & W. N. Ellis) (ITZ, Amsterdam). Czechoslovakia: 1 ♂, Slovakia, Cenkov u Stúrova, 28.vii.1975 (Boucek) (BMNH). France: 1 ♂, Bouches du Rhône, Fonscolombe, 13.vii.1978 (Graham) (BMNH). India: 1 ♀, Delhi, Indian Agricultural Research Institute area, 14.x.1979 (Boucek) (BMNH). Madeira: 2 ♂, 2 ♀, São Martinho, 8.v.1980, 1 ♀, 9.v.1980, 1 ♀, 10.v.1980, 2 ♂, 1 ♀, 21.v.1980, 1 ♀, 26.v.1980 (E. M. & M. de V. Graham) (BMNH). Sardinia: 2 ♀, Villasimius, vi.1975 (Boucek) (BMNH). Spain: 1 ♂, Alicante, Moraira, 17.vi.1973; 1 ♀, Granada, Calahonde, 22.vi.1973; 1 ♀, Málaga, near Nerja, 23.vi.1973 (Boucek) (BMNH). USSR: 2 ♀, Moldavia, Kotovskoe, 29.vi.1960 (Talickii) (BMNH), 1 ♂, Kisinev, 5.vii.1960 (Talickii) (BMNH) 1 ♂, Kornesty, 30.vi.1961 (Boucek) (BMNH); Azerbaijan, Chudat/Kuba, 12.vii.1967 (Boucek) (BMNH), 1 ♀, Baku, 2.vii.1967 (Boucek) (BMNH).

Non-paratypic material. Australia: 1 ♀, Queensland, Brisbane, Indooroopilly, 7.xii.1976 (Boucek) [BMNH], 1 ♀, Broken Rivei, Enngella National Park, 30.ii.1976 (Boucek) (BMNH).

Host. Unknown. I have swept the species from coarse grasses; its host is likely to be some Dipteron on these.

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