

structure. Males from Central Europe and USSR have the flagellum mainly yellow (*f. panonicus* Erdős) but intermediate forms exist between this extreme and northern European forms with fuscous flagellum. Strength of the metallic tints of the body, and colour of legs, vary in both sexes. The size of the σ antennal scape varies noticeably; at one time I thought that two species might be involved, but attempts to segregate them on reliable characters failed. I have examined a form from Iran which differs slightly from European *incertus* in having the first segment of mid and hind tarsi less obviously shorter than the second, stigmal vein shorter (M 3.1-4.0 times length of ST), σ flagellum mainly yellow. It may be specifically distinct but I would prefer to see additional material before expressing a definite opinion.

Oomyzus scaposus (Thomson)
(Figs 195, 207, 373)

Tetrastichus scaposus Thomson, 1878: 284. Lectotype φ , Sweden: Småland (Bohemian) (ZIL), designated by Graham (1966b: 41) [examined].

Tetrastichus coccinellae Kurdjumov, 1912: 239. Lectotype φ , USSR: Ukraine, Poltava (ZIL), designated by LaSalle (1986: 600) [not examined]. [Synonymised with *scaposus* by Bouček, 1988: 695.]

Syntomosphyrum taprobanae Waterston, 1915: 337-340. Holotype φ , Sri Lanka: Peradeniya, 20.ii.1914 (M.A. Rutherford) (BMNH) [examined]. [Synonymised with *scaposus* by Bouček, 1988: 695.]

Tetrastichus melanis Burks, 1943: 529-530. Holotype φ , USA: Washington, Wenatchee, 1.viii.1915, from pupa of *Coccinella quinquepunctata* (E.J. Newcomer) (USNM) [examined].
Syn.n.

Aprostocetus coccinellae (Kurdjumov) Graham, 1961b: 40.

Tetrastichus coccinellae Kurdjumov; Domenichini, 1966a: 99, 1966b: 26.

Oomyzus scaposus (Thomson); Bouček, 1988: 695.

Krombein, Burks et al. (1967: 227) remarked that *Tetrastichus melanis* Burks was "probably a syn. of the European *coccinellae* Kurdjumov". My examination of the holotype of *melanis* confirms this.

When discussing the synonymy of *scaposus*, Bouček (1988: 695) remarked "Syntomosphyrum cerococci Khan & Shafee, 1981, from India, also very probably belongs here". However, Khan & Shafee's figure 1A of the whole insect (female) shows the basitarsus of both mid and hind legs as equal in length to the second tarsal segment (it is distinctly shorter in *scaposus*), while the speculum is very large and extends beneath M as far as ST (much smaller and not extending so far in *scaposus*). Also the host of *cerococci* suggests a different species.

φ . Differs from that of *incertus* as follows. Head not broader than mesoscutum; lateral ocelli larger. Eyes with very short pubescence. Antenna (Fig. 195) with pedicellus shorter, 1.5-1.7 times as long as broad, from hardly as long as, to very slightly longer than F1; funicular segments usually a little longer than broad, rarely quadrate; clava 2.7-3.1 times as long as broad, spine about 0.4 length of C3, apical seta about as long as spine; setae of flagellum standing out only slightly. Thorax about 1.3 times as long as broad, more strongly arched dorsally. Mid lobe of mesoscutum with areoles of reticulation mostly shorter, 2-3 times as long as broad; median line absent; 3-4 fine adnotaular setae on each side.

Scutellum with submedian lines a little nearer to sublateral lines than to each other, enclosed space 2.2-2.6 times as long as broad; anterior setae in or slightly behind middle. Propodeum somewhat (up to 1.5 times longer than dorsellum; median carina sharp, thin and expanded only near hind margin; surface with very fine, very slightly raised reticulation; sometimes traces of plicae at hind margin; spiracles suboval, fully exposed, about 0.5 their length from metanotum; callus with 2-5 setae. Forewing 2.1-2.15 times as long as broad; M slightly shorter than costal cell, 3.0-3.7 times length of ST, its front edge with 9-12 setae; speculum somewhat larger, pilosity of wing beyond it less thick. Hindwing obtuse or subobtuse, cilia 0.27-0.33 breadth of wing. Hypopygium (Fig. 373) transverse; lateral lobes broad, median lobe short, rounded.

Metallic gloss of head and thorax bluish but often very weak, occasionally absent. Antennae fuscous to black. Tibiae mainly brown to blackish. Length 1.1-1.6 mm.

σ . Differs as follows. Antenna (Fig. 207) with scape about as long as eye, flattened, about 2.5 times as long as broad, ventral plaque placed about in middle and about 0.6 length of scape; pedicellus plus flagellum 1.2-1.25 breadth of mesoscutum; pedicellus 1.4-1.7 times as long as broad; funicle filiform, slightly stouter than pedicellus; F1 subquadrate, distinctly shorter than F2, F2 1.3-1.5 times as long as broad, tending to be a little shorter than F3, F3 and F4 subequal in length, each 1.6-1.85 times as long as or slightly longer than F3 plus F4, with C1 1.5-1.7 times as long as broad, C2 slightly shorter and hardly longer than broad, C3 much shorter; each funicular segment with a compact subbasal whorl of dark setae, those on F1 and F2 reaching somewhat beyond the tips of the segments, those on F3 and F4 reaching hardly beyond; C1 with some rather long subbasal setae. Gaster oblong-oval, about as long as but slightly narrower than thorax.

Antennae funicle at least partly pale, sometimes brownish proximally and testaceous distally, often with F1 and F2 testaceous and F3 and F4 yellowish; occasionally whole funicle yellowish; clava fuscous or black.

MATERIAL EXAMINED. Many σ , φ . Austria, Czechoslovakia, Germany, Great Britain, Hungary, Spain (Canary Islands), Sweden, Switzerland, USSR; Egypt; India, Indonesia, Pakistan, Sri Lanka; USA.

HOSTS. *Coccinella quinquepunctata* Kirby, *C. septempunctata* L., *C. undecimpunctata* L., *C. sp.*, *Chilocorus bipustulatus* (L.), *Chilomenes sexmaculata* (F.), *Synharmonia conglobata* (L.), as a gregarious endophagous parasite of the host prepupae and pupae.

COMMENTS. The scape of the male often collapses (and sometimes appears to be stretched slightly) in dried specimens, when it appears abnormally broad (as in the figure 18b in Erdős, 1954). The undistorted scape appears as in Fig. 207.

Oomyzus anomalus sp.n.
(Figs 196, 198, 208)

φ . Differs from those of *incertus* and *scaposus* mainly in the characters given in

the segments. Gaster oblong-oval, shorter and narrower than thorax. Length 1.2-1.4 mm.

MATERIAL EXAMINED. 11 ♂, 39 ♀. Holotype ♀, Czechoslovakia: Moravia, Bilovice nad Svitavou, reared iv.1960 from pupa of *Brachyopa* sp. (J. Dušek) (BMNH).

Paratypes. Same data as holotype, 11 ♂, 38 ♀. (BMNH).

HOSTS. *Brachyopa* sp. (Dipt., Syrphidae).

COMMENTS. The above material of *brachyopae* was misidentified as *murcia* (Walker) by Domenichini (1967).

Tetrastichus solvae sp.n.
(Fig. 266)

♀. Differs from that of *murcia* as follows. POL about twice OOL. Longest setae of vertex 0.8 OD. Setae of eyes 0.4-0.5 OD. Antenna (Fig. 266) with scape reaching lower edge of median ocellus; pedicellus as long as F1 and 1.35-1.5 times as long as broad; funicular segments subequal in length, F1 and F2 each 1.1-1.25 times as long as broad, F3 quadrate to 1.1 times as long as broad; clava 2.6-2.8 times as long as broad, spine more prominent, 0.3-0.35 length of C3. Mid lobe of mesoscutum: median line absent or traceable just for a short distance in front of scutellum; 3 adnotaular setae on each side. Mesoscutum and scutellum rather more delicately sculptured and slightly more shiny. Forewing with M 3.65-3.85 length of ST, its front edge with 10 setae. Gaster subcircular, shorter than but about as broad as thorax, its apex forming an obtuse angle; last tergite very short, much broader than long; ovipositor sheaths hardly projecting.

Head and thorax black, non-metallic or with a weak bluish tinge in places; gaster with a more distinct bluish tint. Length 1.1-1.4 mm.

♂. Differs as follows. Antennal scape 2.8 times as long as broad, just reaching vertex, ventral plaque 0.6 its length, setae near front edge broken off, but their length was probably less than breadth of scape; pedicellus 1.25 times length of F1 and twice as long as broad; funicle hardly stouter than pedicellus, nearly filiform; F1 slightly shorter than F2 and 1.5 times as long as broad, following segments subequal in length, each about 1.8 times as long as broad; clava hardly broader than F4, 3.6 times as long as broad, somewhat longer than F3 plus F4; each funicular segment with a compact whorl of dark setae which reach slightly beyond the tip of the segment. Median line of mesoscutum fine but traceable over about posterior 0.5. Gaster short-oval, much shorter than thorax. Length about 1.1 mm.

MATERIAL EXAMINED. 2 ♂, 2 ♀. Holotype ♀, Spain: Canary Islands, Tenerife, Barranco de Bufadero, reared 25.v.1971 from *Solva* (= *Xylomyia*) *cabreræ* (J. Menier) (BMNH).

Paratypes. Same data as holotype, 2 ♂, 1 ♀ (BMNH).

HOSTS. *Xylomyia cabreræ* (Becker) (Dipt., Xylomyiidae) in twigs of *Euphorbia canariensis*.

THE *CLITO*-GROUP

Differs from *miser*-group in the characters summarised in the second part of couplet 2 of key to females.

Tetrastichus melasomae sp.n.
(Figs 268, 388)

♀. Superficially resembles ♀ *lyridice* (Walker) but readily distinguished from it by its very narrow, almost parallel-sided costal cell. It also has weaker reticulation of the externo-dorsal surface of the hind coxae, while the malar space is shorter; 0.5-0.55 length of eye.

POL virtually twice OOL. Antenna (Fig. 268) with scape 0.84-0.87 length of eye; pedicellus plus flagellum 1.23-1.25 breadth of mesoscutum; pedicellus much shorter than F1 and twice as long as broad; funicular segments subequal in length, each 2.1-2.5 times as long as broad; clava 3.8-4 times as long as broad, hardly as long as F3 plus F4, without a constriction between C1 and C2; setae of flagellum standing out only slightly. Mid lobe of mesoscutum with 3-4 adnotaular setae on each side. Propodeal callus with 1 or 2 setae near spiracle and 1 farther back. Forewing with costal cell 13-17 times as long as broad. Gaster ovate, about as long as head plus thorax, 1.6-1.9 times as long as broad, acute; last tergite slightly broader than long. Hypopygium (Fig. 388) moderately transverse; lateral lobes broad; median lobe narrower, subobtusate.

Body bright blue to greenish blue; hind margins of gastral tergites narrowly purplish. Antennal scape yellow, sometimes infuscate dorsally; rest of antennae brown. Coxae coloured like body; femora except their tips broadly black; legs otherwise yellow, with claws sometimes fourth tarsal segment brown. Wings hyaline, venation yellowish to testaceous. Length 1.5-1.8 mm.

♂. Unknown.

MATERIAL EXAMINED. 7 ♀. Holotype ♀, Czechoslovakia: Moravia, Mohelno, reared 21.vi.1964 from *Melasoma* (= *Chrysomela*) *vigintipunctata* (Hrdý) (BMNH).

Paratypes. Same data as holotype, 6 ♀ (BMNH).

HOSTS. *Chrysomela vigintipunctata* (L.) (Col., Chrysomelidae).

COMMENTS. This species seems best placed in the *clito*-group although in some respects it is intermediate between that and the *miser*-group.

Tetrastichus clito (Walker)
(Figs 283-285, 307, 389)

Cirrospilus Clito Walker, 1839: 30. Lectotype ♂, Great Britain: near London (Walker) (BMNH), designated by Graham (1961b: 39) [examined].

Eulophus cassidae Dufour, 1846: 20. Syntypes ♂, ♀. France: ex *Cassida murrea* (Dufour) (not located). Syn.n.

Entedon Cassidarum Ratzeburg, 1852: 248. Syntypes, Germany: unlocalised (von Siebold, Rosenhauer) (destroyed). Syn.n.

GRAHAM, M. W. R. de V., 1991. A reclassification of the European Tetrastichinae
(Hymenoptera: Eulophidae); revision of the remaining genera.
Mem. Am. ent. Inst., 49: 1-322
Graham 1991

European Tetrastichinae: *Tamarixia*

285

Submedian lines of scutellum very slightly nearer to sublateral lines than to each other, enclosed space 2.4 times as long as broad. Dorsellum moderately shiny; weakly alutaceous. Propodeum moderately shiny, with rather coarse though hardly raised reticulation medially, sculpture weaker at sides. Forewing with M about 0.65 length of costal cell and about 3 times length of ST, its front edge with 5 rather long setae; speculum large, extended as a wedge-shaped strip as far as ST; wing beyond it rather sparsely pilose; ST only very slightly constricted basally, with 1 long seta just beyond the middle.

Black; mesoscutum with extremely weak olivaceous tinge. Antennal scape pale yellow, pedicellus brownish, flagellum ochraceous. Coxae and proximal 0.65 of femora black, legs otherwise yellow with a narrow subbasal fuscous ring on hind tibiae, fourth segment of tarsi black. Tegulae fuscous. Wings hyaline; venation yellowish-testaceous. Length 0.55 mm.

♂. Unknown.

MATERIAL, EXAMINED. 1 ♀. Portugal (Madeira).

HOSTS. Unknown.

Tamarixia sp. indet.

♀. Very close to the holotype of *pallicornis* (Walker), differing only in the characters noted in the key to females, couplet 5.

♂. Unknown.

MATERIAL EXAMINED. 2 ♀. Spain: 1 ♀. Canary Islands, Tenerife, Adeje, Boco del Infierno, 19.iii.1984 (Gijswijt) (MJG). Turkey: 1 ♀, Burdur, 900 m., 22.vii.1981 (H. & Th.v.Oorschot & v.d. Brink) (MJG).

HOSTS. Unknown.

COMMENTS. I have thought it advisable not to describe this species, in case further material should indicate that it could be within the range of variation of *pallicornis*.

Tamarixia monesius (Walker), comb.n.
(Figs 312, 313, 326)

Cirrospilus Monesius Walker, 1839a: 297-298. Lectotype ♂, Great Britain: near London (Walker) (BMNH), designated by Graham (1961b: 41) [examined].

Tetrastichus pallicornis Thomson, 1878: 286. Lectotype ♀, Sweden; Smaland (Boheman) (Zl); designated by Graham (1961b: 41) [examined]. (Synonymised with *monesius* by Graham: 1961b: 41.)

Tetrastichus monesius (Walker) 1846: 75; Dornenichini, 1966a: 83, 1966b: 40, 1967: 76; Kostjukov: 1978: 440, fig. 140, 1-6.

Aprostocetus monesius (Walker) Graham, 1961b: 41.

♂. The forewing venation and large speculum, black head and mainly yellow legs are characteristic. In other respects much resembles *pubescens* (Nees) from which it differs as follows. Eyes separated by 1.1-1.2 times their length. Setae

♀, Ryshkanova, from [examined].

distinctly from [ice].

Walker) in most [plus much longer] [out as pedicellus,] [1.5 times, F2 1.3] [and F3, about 2.5] [funicle.]

pedicellus about as long [pedicellus plus] [as long as broad,] [wing slightly distad;] [1, each about 1.8] [nearly 6 times as] [early half length]

monesius (?) *orientalis*

as having been [ae] on *Eleagnus*

Madeira, Northern

do not agree too well [how inaccurate] [on, although the] [isly approximate] [description may] [be] [Ilhéu Chão b]

initially about [al in length,] [e; clava broad] [as long as] [ts areoles ab] [ble through]

Tamarixia pronomus (Walker), comb.n.
(Figs 321, 322, 329)

Cirrospilus Pronomus Walker, 1839a: 312-313. Lectotype ♀, Great Britain: near London (Walker) (BMNH), designated by Graham (1961b: 42) [examined].

Cirrospilus pamylen Walker, 1839a: 313. Lectotype ♀, Great Britain: Isle of Wight (Walker) (BMNH), designated by Graham (1961b: 42) [examined]. [Synonymised with *pronomus* by Graham, 1961b: 42.]

Tetrastichus pronomus (Walker) 1946: 77; Domenichini, 1966a: 85, 1966b: 46.

Tetrastichus obscuratus André, 1878: 83. LECTOTYPE ♀, France: Beaune, from galls on *Centranthus angustifolius* (André) (MNHM), here designated [examined]. Syn.n.

There are two female syntypes of *Tetrastichus obscuratus* from André's collection in MNHM, and they are both conspecific with *pronomus* (Walker), showing only very slight differences in sculpture and other details, which I regard as being within the range of variation of *pronomus*. The lectotype is labelled "Beaune; ♀; Des galles de *Centranthus angustifolius*; MUSEUM PARIS COLLECTION ERNEST ANDRÉ 1914"; it now bears my lectotype label.

♀. Resembles ♀ of *upis* (Walker) in several respects, particularly its dull, distinctly reticulate dorsellum and rather distinctly reticulate propodeum. It differs in having shorter funicular segments, darker legs, usually more or less darkened antennal scape, and more densely pilose forewing. Antenna (Fig. 321) with pedicellus 1.2-1.55 times length of F1 and 2.0-2.5 times as long as broad; funicle proximally tending to be a little stouter than pedicellus, funicular segments subequal in length, F1 1.3-1.75 times, F2 1.3-1.55 times, F3 1.0-1.35 times as long as broad; clava 2.3-2.5 times as long as broad, hardly or somewhat longer than F2 plus F3. Submedian lines of scutellum slightly nearer to sublateral lines than to each other, enclosed space 1.7-1.9 times as long as broad. Propodeum tending to be duller than in *upis*, with rather stronger reticulation which is slightly raised, occasionally almost as dull as the dorsellum; median carina thin and sharp, expanded only slightly at hind end. Forewing (Fig. 322) with speculum usually represented by a very narrow strip just outside the basal vein, sometimes rudimentary or almost absent; wing beyond it densely to very densely pilose; M 3.0-3.85 times length of ST, its front edge with 6-9 (-10) setae.

Colour much as in *pubescens* but a little more variable. Antennal scape sometimes yellow but often broadly infuscate medially, or wholly black. Femora sometimes only infuscate basally, in dark specimens black with only their tips pale. Wings hyaline or lightly infumate. Length 0.8-1.5 mm.

In a ♀ from Canary Islands, La Palma, the antennal scape is yellow and there is an obscure testaceous transverse band near the base of the gaster, but it appears to belong to *pronomus*.

♂. Differs as follows. Antenna (Fig. 329) with scape about as long as an eye and reaching vertex, 3.0-3.5 times as long as broad, ventral plaque minute, about in middle; pedicellus plus flagellum about 1.4 times breadth of mesoscutum; pedicellus about twice as long as broad, distinctly longer than F1; funicle proximally distinctly stouter than pedicellus but tapering slightly distad; F1 much shorter than F2 and quadrate or very slightly transverse, F2 to F4 subequal in length, each 1.7-2.0 times as long as broad; clava 4.0-4.5 times as

long as broad, as long as or slightly longer than F3 plus F4, with weak constriction between C1 and C2, each of which is 1.6-1.8 times as long as broad. Gaster oval, as long as or slightly shorter than thorax, tending to be a little narrower than thorax.

MATERIAL EXAMINED. 10 ♂, many ♀. Czechoslovakia, France, Great Britain, Greece, Italy, Norway, Portugal (including Madeira), Spain (Canary Islands), Sweden.

HOSTS. *Trioxa apicalis* Förster, *T. centranthi* (Vallot) *T. kratochvili* Vomp. (Hem., Triozidae).

Tamarixia pygmaeola (Erdős), comb.n.

Tetrastichus pygmaeus Erdős, 1954: 362. Holotype ♀, Hungary: Berhida, 30.vii.1952 (Erdős) (TM) [examined]. [Secondary homonym of *Tetrastichus pygmaeus* (Nees), 1834.]

Tetrastichus pygmaeolus Erdős, 1958: 321. [Replacement name for *pygmaeus* Erdős, homonym of *pygmaeus* Nees.]

Aprostocetus pygmaeolus (Erdős) Graham, 1961b: 42.

Tetrastichus pygmaeolus Erdős, Domenichini, 1966a: 85, 1966b: 47, 1967: 76.

♀. Very close to *pronomus* (Walker). The only distinctions between the two appear to be those noted in the key to females, couplet 12. I have not seen any ♀ of *pronomus* which agrees completely with the holotype of *pygmaeolus* Erdős and conclude that they are distinct species. The antennae of *pygmaeolus* are yellow with the pedicellus slightly darker basally, and the scape with an extremely weak brownish tinge medially. The forewings are hyaline, with very pale, almost white, pilosity; venation pale yellow. Length about 0.7 mm.

♂. Unknown to me; mentioned, without description, by Domenichini (1966a: 85).

MATERIAL EXAMINED. 1 ♀. Hungary (holotype). Domenichini (1966a: 85) recorded the species also from France, but I have not seen the material.

HOSTS. A species of Hemiptera Psyllidae (not more closely identified) on *Rumex scutatus*, according to Domenichini (1966a: 85).

TETRASTICHOMYIA Girault

Tetrastichomyia Girault, 1916: 48. Type-species: *Miotropis chisticampae* Ashmead, by monotypy and original designation.

[*Syntomosphyrum* Förster; Burks in Krombein et al., 1979: 1004-1005. Misidentification.]

Tetrastichomyia [Girault] Graham, 1987: 28, 35, figs 23, 24, LaSalle & Schauff, 1990: 283-284.

DIAGNOSIS. See Graham (1987: 28, 35). The genus appears to be relatively isolated. It is recognizable by the following synapomorphies. Dorsellum of metanotum divided, by a median longitudinal groove or by a ridge; propodeum with some rather irregular sculpture, often rugosity or wrinkles, hind corners subrectangular or acute, callus with a sharp longitudinal carina; mid lobe of mesoscutum without median line, scutellum without submedian lines; anterior margin of ♀ hypopygium not trilobed but almost truncate; ♂ brachypterous, with legs short and (especially the femora) very stout, tarsi very short and thick.