

**Western Palaearctic Cryptinae (Hymenoptera: Ichneumonidae) in the National Museums of Scotland, with nomenclatural changes, taxonomic notes, rearing records and special reference to the British check list. Part 5. Tribe Phygadeuontini, subtribe Phygadeuontina, with descriptions of new species**

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**Synopsis**

Distributional, phenological and, in many cases, rearing data are given for 72 species of western Palaearctic Phygadeuontina (sensu Townes) (Hymenoptera: Ichneumonidae, Cryptinae), based on about 1100 specimens in the National Museums of Scotland. Twenty species are recorded from Britain for the first time, among them seven species that are newly described (*Tropistes scoticus* sp. nov., *Orthizema francescae* sp. nov., *Stibeutes blandi* sp. nov., *Theroscopus horsfieldi* sp. nov., *Theroscopus mariae* sp. nov., *Theroscopus naninae* sp. nov. and *Phygadeuon palus* sp. nov.). Keys are provided for the females of western Palaearctic species of *Tropistes*, and macropterous females of European *Orthizema* and (separately) *Theroscopus* species. *Boleslawia* Sawoniewicz is newly synonymised under *Tropistes* Gravenhorst, and *Theroscopus rotundator* Aubert under *T. ochrogaster* (Thomson). *Tropistes burakowskii* (Sawoniewicz) and *Phygadeuon melanopygus* (Gravenhorst) are new combinations.

**Key words:** Cryptinae, Phygadeuontini, British Isles, western Palaearctic region, distribution, host associations, phenology.

**Introduction**

The first part of this series (Schwarz & Shaw, 1998) outlines the general rationale for the work, our approaches to it, and the sources of material. The present paper gives an account of around 1100 specimens of western Palaearctic species of the subtribe Phygadeuontina in the National Museums of Scotland (NMS). This does not include over 1500 specimens provisionally sorted to the genus *Phygadeuon* whose identity must await extensive revisionary work on this large and intractable genus, in which we have been able to identify only 15 species in NMS.

Of the 72 determined species in the collection, 65 are represented by British specimens. Seven species are described as new and keys to females are given for respectively western Palaearctic or European macropterous species of three

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of the relevant genera (*Tropistes*, *Orthizema* and *Theroscopus*). In all, 20 species (including the seven newly described ones) are recorded from Britain for the first time, and additional British records for some of these from the BMNH collection are added by G. Broad (as pers. comms). Because an up to date and richly annotated check list to British Ichneumonidae is given by Broad (<http://www.nhm.ac.uk/resources-rx/files/ichneumonidae-checklist-for-web-27752.pdf>), we have not provided a check list with this paper, nor do we cover every species known from Britain. Awareness is needed that our treatment follows Townes's (1970) subtribal classification (except that we have not retained Cephalobaridina) and generic sequence, unlike Broad's check list in which genera are arranged alphabetically within tribes. The two treatments are otherwise compatible.

As far as we know, the species treated in this paper are solitary parasitoids. They mostly attack and develop as ectoparasitoids within small cocoons and similar structures, either more or less exposed or within plant tissue, but some genera parasitise cyclorrhaphous Diptera, emerging as adults from the host's puparium and in some cases (e.g. *Phygadeuon clotho* Kriechbaumer and *P. fraternae* Horstmann) they are definitely known to have parasitised the host as a larva. In contrast to these koinobiont endoparasitoids, however, the majority have generally been regarded as idiobionts, although their rather high degree of host specialisation could possibly indicate that koinobiont development occurs more widely than is currently recognized among those species that are endophagous.

In the presentation of records, 'several' refers to 4–10 specimens, 'many' to 11–25, and 'numerous' to more than that. Rearing records are given in condensed form such that a number in brackets indicates the number of rearings (i.e. host mortalities) concerned. Unless otherwise indicated, rearing records are from the British Isles. The British Isles Vice County (V.C.) numbers referred to in the text correspond to those mapped in Fig. 1.

Morphological terminology follows Townes (1969) except for the terms malar space, mesopleuron, metapleuron, area superomedia and trochantellus, which follow Fitton *et al.* (1988). The length of the third antennal segment is measured laterally, without the annellus.

## Material in NMS and taxonomic notes

### PHYGADEUONTINA

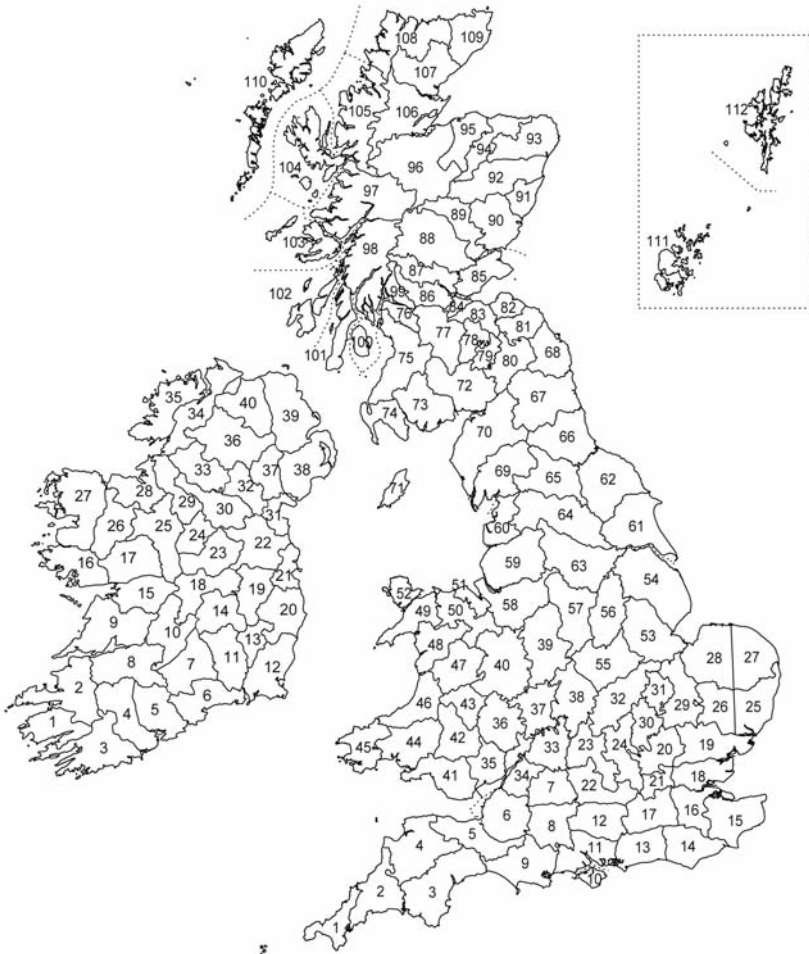
#### *Platyrhabdus clypeatus* Horstmann, 1998

Horstmann (1998) included paratypes from England and Scotland in his description of this species, 3 ♀, 2 ♂ of which are in NMS.

Several specimens. **England:** V.C.s 22, 27, 29. **Isle of Man:** V.C. 71. **Scotland:** V.C. 83. A specimen from England, V.C. 23 has been transferred to coll. Schwarz. Specimens collected in reedbeds from (?v)vi–viii.

#### *Platyrhabdus inflatus* (Thomson, 1884) (= *rufus* (Morley, 1907))

Many specimens. **England:** V.C.s 23, 27, 29. **Isle of Man:** V.C. 71. **Scotland:** V.C.s 99, 105. **France:** Dordogne. Specimens collected in Britain



**Fig. 1.** Vice counties of Great Britain and of Ireland. The Irish series is prefixed 'H' when referred to in the text.

from v–vii and in ix/x, in France also in iv. One small ♂ was reared from an ichneumonoid cocoon, probably not its own, in a stem of *Dactylis glomerata* coll. x, em. v the following year (*F. D. Bennett*).

***Platyrhaddus monodon*** (Thomson, 1884)

Numerous specimens. **England:** V.C.s 22, 23, 25, 29. Specimens collected in fens and reedbeds, in iv/v and from vi–ix.

***Platyrhabdus nervellator*** Horstmann, 1998

Horstmann (1998) described this species from a single reared series from England, of which the ♀ holotype and 1 ♀, 1 ♂ paratypes are in NMS.

**England:** 2 ♀, 1 ♂, Dorset, Portland Bill (V.C. 9), ex stems *Smyrnum* with *Aethes beatricella* (Walsingham) (Lepidoptera: Tortricidae), coll. 9.iv.1985, em. 10.x.1985 (1 ♂) and 13.x.1985 (2 ♀) (*N. Hall*); 1 ♂, Norfolk, Santon Downham, TL8188 (V.C. 28), 16–25.v.1985 (*J. Field*) (det. K. Horstmann).

***Sulcarius*** Townes, 1970

Some males of this genus in NMS remain unidentified.

***Sulcarius fontinalis*** (Ruschka, 1926)

This species is here recorded as British for the first time. **England:** 1 ♀, Oxfordshire, Frilford Heath, SU4498 (V.C. 22), 25.iv–25.v.1991 (*K. Porter/NCC*). **Scotland:** 1 ♀, Wester Ross, Kishorn, NG8338 (V.C. 105), vi.1987 (*P. W. Brown*). Both specimens were determined by K. Horstmann.

***Sulcarius laevipleuris*** Horstmann, 1992

Horstmann (1992) included paratypes from England in his description of this species.

**England:** 1 ♀, Hampshire, Ashford Hill Meadow, SU5662 (V.C. 12), 2.v–6.vi.1989 (*K. Porter/NCC*); 1 ♀, Oxfordshire, Dry Sandford Pit, SU4699 (V.C. 22), 14–30.vi.1990 (*K. Porter/NCC*); 1 ♀, Oxfordshire, Taynton Fen, SU2314 (V.C. 23), 16.vi–17.vii.1989 (*K. Porter/NCC*); 1 ♀, Oxfordshire, Wychwood Forest, SP3417 (V.C. 23), 4–23.v.1990 (*K. Porter/NCC*). The foregoing were determined by K. Horstmann.

***Sulcarius nigricornis*** (Thomson, 1884) (= *homocerus* (Thomson, 1885))

Fitton *et al.* (1978) listed this as a doubtfully placed species of *Hemiteles* Foerster.

**England:** 1 ♀, Oxfordshire, Chimney Meadows Ditch, SU3599 (V.C. 22), 10. vii–9. viii.1991 (*K. Porter/NCC*); 1 ♀, Cumbria, Winmarleigh Moss (V.C. 69), 14.vi.1999 (*P. J. Chandler*). **Wales:** 1 ♀, Anglesey, Cors Bordeilio, SH5677 (V.C. 52), 14.vi.1998 (*P. Holmes/NCC*).

***Sulcarius nigridens*** Horstmann, 1992

Horstmann (1992) designated an English specimen as holotype when describing this species.

**England:** 1 ♀, Wiltshire, Savernake Forest, SU2265 (V.C. 7), 2–22.v.1990 (*K. Porter/NCC*); 1 ♀, Oxfordshire, Barrow Farm Fen, SU4697 (V.C. 22), 5.iv–17.v.1990 (*K. Porter/NCC*). **Scotland:** 1 ♀, Inverness-shire, Creag Meagaidh, NN4183 (V.C. 97), 375 m, 15.v–17.vi.1998 (*D. Horsfield*); 1 ♀, Jura, Ardlussa, NR6587 (V.C. 102), 24.v–4.vi.1982 (*D. Horsfield*).

***Sulcarius* sp. A** [new species]

This species, which will be formally described elsewhere (Horstmann, in prep.), is here recorded as British for the first time. Several specimens.

**England:** V.C.s 12, 22, 23. **Scotland:** V.C. 89. Specimens collected from v–vi.

***Tropistes* Gravenhorst, 1829**

As we are describing a new species which keys well to *Tropistes* using the generic key by Townes (1970) but seems to be more closely related to *Boleslawia* Sawoniewicz than to the hitherto known species of *Tropistes*, we studied all known species of both genera to clarify the generic position of the new species. The type species and only known species of *Boleslawia*, *B. burakowskii* Sawoniewicz, and the related species described here as *Tropistes scoticus* sp. nov., differ from the key characters given by Townes (1970) for *Tropistes* by their gasters, which are not or only apically compressed, and the new species in addition by its upcurved ovipositor. *Boleslawia* and *Tropistes* have, among others, the following characters in common:

Face short; clypeus wide and flat, its lower margin depressed only laterally and blunt medially; malar space short; genal carina joining oral carina far behind mandibular base; thorax distinctly compressed; subtegular ridge rather flat; fore wing with areolet open (second intercubital vein absent or very weak), first intercubitus short and cubitus between first intercubitus and second recurrent vein distinctly longer than cubitus between second recurrent vein and second intercubitus (although the second intercubitus is absent, its position is usually recognisable); propodeum with posterior transverse carina more robust than other carinae; first segment of gaster rather flat and rather straight, without or with only very short and indistinct median dorsal carinae.

Because *Boleslawia* and *Tropistes* have many characters in common, they seem very closely related. The compressed thorax, the form of the clypeus, the flat subtegular ridge and the shape of the areolet are believed to be synapomorphies. We have not found substantive characters separating the two genera, the lack of compression of the gaster in *Boleslawia* seeming merely plesiomorphic, and consequently we are synonymising them (**syn. nov.**). *Tropistes burakowskii* (Sawoniewicz) is a new combination (**comb. nov.**).

**Key to females of the western Palaearctic species of *Tropistes***

- 1 Third segment of antenna stout, about 2 times as long as wide. In lateral view ovipositor tip evenly narrowed to the apex dorsally (Fig. 14). Small species with a body length up to 4 mm. . . . . 2
  - Third segment of antenna slender, 4.5–5.7 times as long as wide. In lateral view ovipositor tip dorsally about horizontal and in most cases strongly narrowed apically (Figs 12, 13, 15). Larger species with a body length of about 4–9 mm. . . . . 3
- 2 Ovipositor 3.5 times as long as hind tibia. Ovipositor sinuate apically. Second tergite of gaster distinctly granulate in its basal half. Mesopleuron with fine longitudinal striation. . . . . ***T. burakowskii*** (Sawoniewicz)
  - Ovipositor 1.6–1.8 times as long as hind tibia. Ovipositor not sinuate apically (Fig. 14). Second tergite of gaster with a mainly smooth background, only basally narrowly and indistinctly granulate. Mesopleuron with scattered punctures on a more or less smooth background. . . . . ***T. scoticus* sp. nov.**

- 3 Ovipositor slender and straight, in lateral view its tip only weakly tapered to the apex dorsally (Fig. 15). Hind coxa black. Tegula white . . . *T. hebraicator* Aubert
- Ovipositor robust and distinctly bent downwards, in lateral view its tip strongly tapered to the apex dorsally (Figs 12, 13). Hind coxa orange or black. Tegula brown or white. . . . . 4
- 4 Ovipositor tip in lateral view raised subapically and very strongly tapered to the apex dorsally (Fig. 12), as seen from above distinctly widened subapically (Fig. 16). Hind coxa black, rarely partly orange. Tegula white. . . . .
- . . . . . *T. nitidipennis* Gravenhorst
- Ovipositor tip in lateral view not raised subapically and less strongly tapered to the apex (Fig. 13), as seen from above not or only hardly widened subapically. Hind coxa orange or black. Tegula brown or white. . . . . 5
- 5 Hind femur 3.7–3.9 times as long as wide. Area superomedia with carina laterally robust, distinctly more so than the carina delimiting area superomedia apically. Hind coxa orange. Tegula brown. Body length 8–9 mm. . . . .
- . . . . . *T. falcatus* (Thomson)
- Hind femur 3.0–3.5 times as long as wide. Area superomedia with carina laterally rather fine and not distinctly more robust than carina delimiting area superomedia apically. Hind coxa entirely or partly blackish. Tegula brown or white. Body length 6–7 mm. (This taxon is very similar to *T. nitidipennis*, differing only slightly in the shape of the ovipositor tip, and it may be only a southern form of the latter.). . . . . *Tropistes* cf. *nitidipennis* Gravenhorst

***Tropistes falcatus*** (Thomson, 1884)

This species is here recorded as British for the first time. **England:** 2 ♂ Norfolk, Santon Downham, TL8188 (V.C. 28), 27.viii–27.ix.1984 and 22.viii–5.ix.1985 (*J. Field*). **Austria:** 1 ♀, Oberösterreich, Langzwettl near Zwettl/Rodl, 24.x.1981 (*M. Schwarz*). We take this opportunity also to record a male specimen in BMNH determined by A. Roman with the data 'British Isles. Ex *Raphidia notata*' (Raphidioptera: Raphidiidae) (G. Broad, pers. comm.).

***Tropistes nitidipennis*** Gravenhorst, 1829

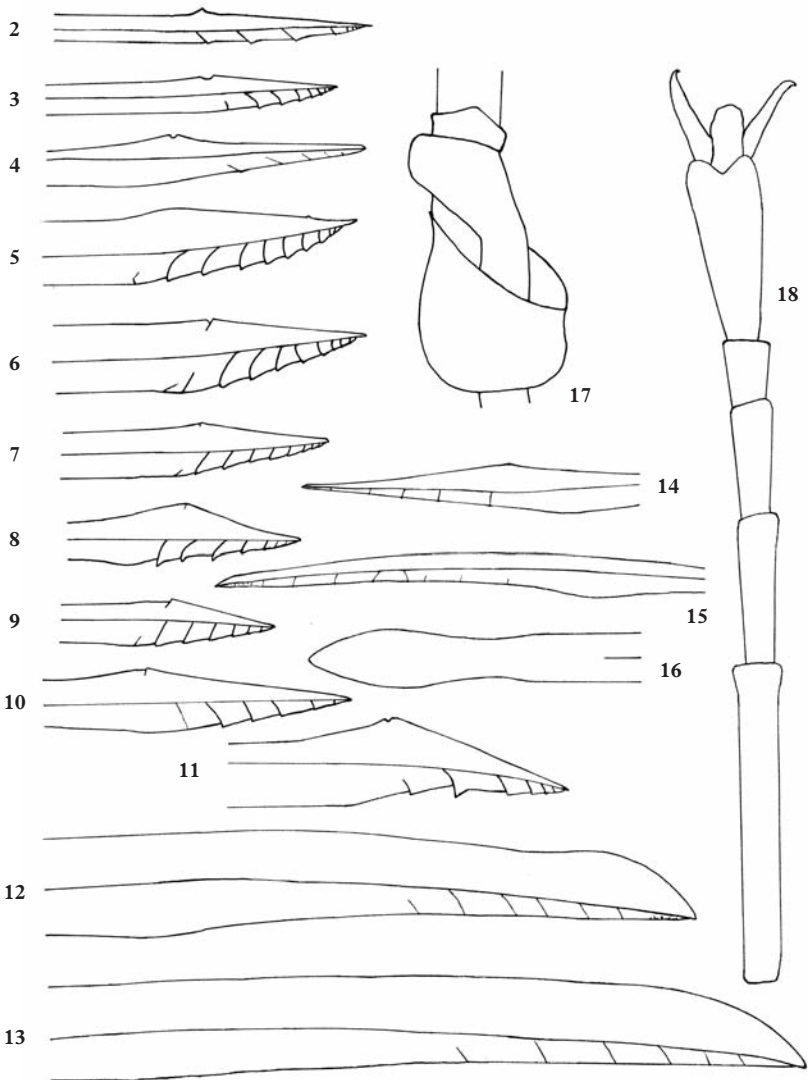
**England:** 1 ♀, Berkshire, Windsor Forest, SU9470 (V.C. 22), 6–15.v.1992 (*K. Porter/NCC*); 1 ♀, 1 ♂ Yorkshire, Scoreby (V.C. 62), 5–12.viii.2003 (*S. Fraser*). **Scotland:** 2 ♀, Inverness-shire, Abernethy Forest (V.C. 95), 15–22.vii.1988 (1 ♀) and 18–26.vii.1989 (1 ♀) (*D. Phillips*). **France:** 1 ♀, 1 ♂, Lot-et-Garonne, Bernac, 26–30.v.1986 (1 ♀) and 8–18.ix.1991 (1 ♂) (*R. R. Askew*); 3 ♂, Dordogne, St Alvére, iv.1999 (1 ♀) and 3–21.v.2004 (2 ♀) (*R. R. Askew*).

***Tropistes scoticus* sp. nov.** (Figs 14, 19, 20)

Holotype (♀): [**Scotland**] 'Paddockmuir Wood nr. Errol, Tayside Malaise trap 2 site Eps North 23/7/87 30/7/87 373 TO N1', 'Dr. D. Phillips NMSZ 2005.043' (in National Museums of Scotland, Edinburgh).

Paratype (♀): same data as holotype except: site E7 South, 3–9.7.1987, 312, TO e2 (in NMS).

*Tropistes scoticus* sp. nov. is easily separated from *T. burakowskii* (Sawoniewicz) and other species of *Tropistes* by its upcurved ovipositor and its ovipositor tip (see below).



**Figs 2–18.** Western Palaearctic Cryptinae. 2–15, ovipositor tips in lateral view: 2, *Stibeutes blandi* sp. nov.; 3, *Theroscopus megacentrus* (Schiodte); 4, *Theroscopus pullator* (Gravenhorst); 5, *Theroscopus mariae* sp. nov.; 6, *Theroscopus ochrogaster* (Thomson); 7, *Phygadeuon gracilentus* Horstmann; 8, *Phygadeuon melanopygus* (Gravenhorst); 9, *Phygadeuon palus* sp. nov.; 10, *Theroscopus naninae* sp. nov.; 11, *Theroscopus* sp. 6; 12, *Tropistes nitidipennis* Gravenhorst; 13, *Tropistes falcatus* (Thomson); 14, *Tropistes scoticus* sp. nov.; 15, *Tropistes hebraicator* Aubert. 16, *Tropistes nitidipennis* Gravenhorst, ovipositor tip in dorsal view. 17, *Theroscopus rufulus* (Gmelin), scape and pedicel. 18, *Theroscopus unguularis* (Thomson), hind tarsus in dorsal view.

Female. Antenna inserted rather low on head (Fig. 19), with 21 segments; third segment 2.1–2.2 times and sixth segment 2.0 times as long as wide; third segment 0.8 times as long as fourth segment. Head lustrous and not granulate except for a stripe on malar space. Face short, with dense punctation above, other parts with very scattered punctures. Clypeus (Fig. 20) wide and flat, with a transverse row of punctures above, lower margin depressed except medially. Upper tooth of mandible somewhat longer than lower tooth. Genal carina joining oral carina far behind mandibular base. Malar space 0.5–0.6 times as long as basal width of mandible. Temple and frons with very fine and scattered punctures. Head behind the eyes moderately narrowed and rounded.

Thorax compressed and lustrous. Epomia present. Notaulus short but distinct. Mesoscutum and scutellum with fine punctures. Mesopleuron with scattered punctures and some longitudinal ridges below. Sternaulus distinct nearly to hind margin of mesopleuron. Metapleuron with fine but distinct punctures.

Propodeum lustrous and with fine punctures. Petiolar area about twice as long as propodeum in front of basal transverse carina measured medially. Apical transverse carina distinctly more robust than basal transverse carina. Lateral longitudinal carina absent between transverse carinae. Area superomedia with median longitudinal carina behind costula absent or weak.

Fore wing with areolet open (second intercubitus absent), first intercubitus short and cubitus between first intercubitus and second recurrent vein distinctly longer than cubitus between second recurrent vein and second intercubitus (although the second intercubitus is absent, its position is recognisable) (Fig. 19). Second recurrent vein with two widely separated bullae. Nervulus distad of basal vein. Nervellus in hind wing intercepted distinctly below the middle.

Hind femur 3.6–3.8 times as long as wide.

First segment of gaster with median dorsal carinae present only basally, dorsolateral carina present but weak. Spiracles distinctly behind middle of first segment of gaster. Postpetiole hardly wider than petiole, granulate (except hind margin), in addition with a few very weak longitudinal ridges and a few punctures. Second tergite of gaster with a mainly smooth background, only basally and indistinctly granulate, with very fine scattered punctures, epipleurum not separated from its tergite. Third tergite with a smooth background and without granulation. Ovipositor sheath 1.6–1.8 times as long as hind tibia. Ovipositor weakly bent upwards, not sinuate. Ovipositor tip (Fig. 14) with a distinct and slightly raised nodus, 4.3–4.6 times as long as high, ventrally with very weak teeth.

Coloration: black. Mandible basad of teeth reddish. Palps, tegula and most of legs orange. Coxae black or brown (fore coxa partly orange); hind trochanter partly, femora partly, hind tibia apically and hind tarsus brown. Fore wing with pterostigma brown.

Body length: 3.6–3.7 mm.

Male unknown.

**Etymology.** Named after the country of origin.

***Orthizema*** Foerster, 1869

The separation of *Orthizema* from *Theroscopus* is somewhat arbitrary, and *Theroscopus* may be paraphyletic with respect to *Orthizema*. Because the length of the area superomedia as well as the length of the propodeum overlaps (these characters were used by Townes (1970) to separate *Orthizema* and *Tricholinum*



from *Theroscopus* and other genera) we found only a few characters (granulation, clypeus with or without teeth and coloration of antenna, see below) which in combination seem to be suitable to recognise two genera. Unfortunately these characters are only reliable for the females (one brachypterous species of *Theroscopus* (*T. bonelli* (Gravenhorst)) is exceptional in having granulation and sculpture on the postpetiole as in *Orthizema*, but has a short propodeum). Males of *Orthizema* sometimes have reduced granulation and more often have a toothed clypeus than females. Such males cannot be distinguished generically from *Theroscopus*. The two closely related species we place here tentatively in *Theroscopus* (*T. pullator* (Gravenhorst) and *T. opacinotum* (Hellén)) are not as granulate as typical *Orthizema* but resemble some species of *Orthizema* in clypeal characters among others. Both species, which in fact may not be specifically distinct, are more or less intermediate between the two genera. Probably the two genera should be merged once the world fauna is investigated and/or DNA analyses are undertaken. We have not seen specimens of *O. macrocerum* (Hellén): this species is included on the basis of a description of the holotype made by K. Horstmann (pers. comm.).

**Characters separating macropterous females of *Orthizema* and *Theroscopus***

- 1 Frons and mesoscutum entirely and distinctly granulate. Ovipositor slender (cf. Fig. 4). Propodeum with area superomedia at least 1.2 times as long as wide. Postpetiole without striation or with rather fine striation. Lower margin of clypeus usually without teeth. Antenna often with a white ring. . . ***Orthizema***
- Usually frons and mesoscutum with a smooth background or partly granulate; in most species at least mesoscutum laterally with a smooth background; if mesoscutum entirely granulate then ovipositor robust (Fig. 11). Propodeum with area superomedia at most 1.4 times as long as wide. Postpetiole variable and sometimes with coarse striation. Lower margin of clypeus in most cases with paired teeth, which may be very small. Antenna usually without a white ring (if a white ring is present then area superomedia not longer than wide). . . . . ***Theroscopus***

As we describe a new species of *Orthizema* in this paper, we provide a key for the macropterous females of the European species. The key below includes some undescribed species which will be described elsewhere (Schwarz, in prep.).

**Key to females of the European species of *Orthizema* with macropterous females** (as *Theroscopus* sp. 6 is easily mistaken for *Orthizema*, it is included in the key)

- 1 Thorax and propodeum orange. . . . . ***O. hadrocerum*** (Thomson)
- Thorax and propodeum entirely or mainly black, rarely thorax with some orange patches. . . . . 2
- 2 Antenna stout, third segment 2.1–2.6 times as long as wide. Hind femur 3.6–4.5 times as long as wide. Hind tibia strongly thickened (Fig. 24). . . . . 3
- Antenna slender, third segment 3.0–5.7 times as long as wide. Hind femur 4.7–5.1 times as long as wide. Hind tibia moderately or weakly thickened (Fig. 25). . . . . 4

- 3 Third segment of gaster finely and densely granulate, densely hairy. Head behind the eyes strongly narrowed (Fig. 22). Second and third tergites of gaster orange. . . . . ***O. francescae* sp. nov.**  
 – Third segment of gaster without granulation, moderately hairy. Head behind the eyes moderately narrowed. Second and third tergites of gaster entirely or mainly black. . . . . ***O. nigri ventre* Horstmann**
- 4 Antenna without a white ring, in most cases extensively orange, rarely brown; if base of antenna is orange and apex brown, then base and apex are in weak contrast. Areolet in most cases closed (i.e. with second intercubitus present, though weak). Second recurrent vein with two distinctly separated bullae. Head behind the eyes weakly narrowed. . . . . 5  
 – Antenna in nearly all cases with a distinct white ring, orange only basally; if antenna without white ring, then orange base and brown apex are in strong contrast. Areolet open (i.e. with second intercubitus absent). Second recurrent vein usually with one bulla, rarely with two bullae. Head behind the eyes strongly or rarely weakly narrowed. . . . . 7
- 5 Third segment of antenna about 3.0 times as long as wide. Areolet open. Lower margin of clypeus with fine paired teeth. Second tergite of gaster orange. . . . . ***O. macrocerum* (Hellén)**  
 – Third segment of antenna 3.9–4.9 times as long as wide. Areolet closed. Lower margin of clypeus without teeth. Second tergite of gaster orange or black. . . . 6
- 6 Second tergite of gaster orange. Third segment of antenna 4.4–4.9 times as long as wide. Tegula yellowish. Hind coxa entirely orange. . . . . ***O. flavicorne* (Schmiedeknecht)**  
 – Second tergite of gaster black. Third segment of antenna 3.9–4.1 times as long as wide. Tegula brown. Hind coxa at least partly dark brown or black. . . . . ***Orthizema* sp. A**
- 7 Clypeus with distinct paired teeth ventrally. Antenna without a white ring. . . . . ***Theroscopus* sp. 6**  
 – Clypeus without teeth. Antenna in most cases with a white ring. . . . . 8
- 8 Third segment of antenna 5.5–5.7 times as long as wide and not entirely orange. Fore wing with second recurrent vein with two more or less distinctly separated bullae. Second and third tergites of gaster orange and usually distinctly blackish laterally. . . . . ***Orthizema* sp. B**  
 – Third segment of antenna 3.1–5.0 times as long as wide and usually entirely orange. Fore wing with second recurrent vein with one bulla or rarely with two indistinctly separated bullae. Second and third tergites of gaster usually entirely orange. . . . . 9
- 9 Third segment of antenna 3.1–4.0 times as long as wide. . . . . ***O. subannulatum* (Bridgman)**  
 – Third segment of antenna 3.8–5.0 times as long as wide. . . . . ***O. triannulatum* (Thomson)**

***Orthizema amabile* (Hedwig, 1939)**

Horstmann (1993a) has already recorded this species from England.

**England:** 1 ♀, Wiltshire, Savenake Forest, SU2167 (V.C.7), 13.vi–4.vii.1990 (*K. Porter/NCC*).



19



20



22



23



21

**Figs 19–23.** Western Palearctic Cryptinae. 19, 20, *Tropistes scoticus* sp. nov., holotype ♀: 19, habitus laterally; 20, face and clypeus. 21–23, *Orthizema francescae* sp. nov., paratype ♀: 21, habitus laterally; 22, head in dorsal view; 23, base of gaster.

***Orthizema francescae* sp. nov.** (Figs 21–24)

Holotype (♀): [England] 'Wychwood Forest Oxon. SP 343171 Mal.Tr. 15.6–17.7.90 NMSZ 1993.074' [V.C. 23; K.Porter/NCC] (in National Museums of Scotland, Edinburgh).

Paratypes (3 ♀): **England:** 1 ♀, Oxfordshire, Wychwood Forest, SP3417 (V.C. 23), 17.vii.–14.viii.1990 (K. Porter/NCC) (in coll. Schwarz). **Wales:** 1 ♀, Anglesey, Llangristiolus, SH4373 (V.C. 52), 30.vi.–16.vii.1982 (S. A. & D. C. Wilkinson) (in NMS). **Scotland:** 1 ♀, Perthshire, Crianlarich, Coire Choille Chuilc, NN3328 (V.C. 88), native pine, vi.1986 (I. MacGowan & R. M. Lyszkowski) (in NMS).

The new species is very similar to *O. mandibulare* Horstmann (with brachypterous females), but can be distinguished by its mandible that lacks a subbasal swelling on the outer face, as well as being macropterous in the female sex.

Female. Antenna with 23–25 segments; third segment 2.3–2.6 times, sixth segment 1.4–1.7 times and penultimate segment 0.6–0.8 times as long as wide; third segment 0.9 times as long as fourth segment; antenna beyond its middle widened and flattened below, but the apex of the antenna somewhat tapered. Head distinctly granulate and matt, with only a few and hardly recognisable punctures. Clypeus with some distinct punctures, granulate dorsally, other parts except the punctures smooth and lustrous. Outer face of mandible without a subbasal swelling. Malar space 1.4–1.5 times as long as basal width of mandible. Head behind the eyes strongly narrowed and short (Fig. 22). Temple 0.3 times as long as length of eye as seen from above. Thorax and propodeum distinctly granulate and matt, with only a few and hardly recognisable punctures. Mesoscutum with short and dense hairs. Sternaulus not reaching hind margin of mesopleuron.

Propodeum with all carinae distinct. Area superomedia 1.3–1.5 times as long as wide, with costula behind its middle.

Fore wing with radial cell short, areolet with second intercubitus lacking, second recurrent vein with one bulla, second discoidal cell with posterodistal corner at an acute angle. Nervellus in hind wing inclivous and intercepted distinctly below the middle.

Hind femur 4.2–4.5 times as long as wide. Hind tibia distinctly thickened (Fig. 24) but less strongly widened than in *O. graviceps*.

First segment of gaster granulate, but postpetiole with fine longitudinal striation. Median dorsal carinae of first segment distinct to behind the spiracle. Second tergite of gaster with fine granulation and with very fine longitudinal ridges developed to a varying extent. Third tergite somewhat more weakly granulate than second tergite. Second and third tergites densely hairy, the punctures giving rise to hairs very small. Ovipositor sheath about 0.6 times as long as hind tibia. Ovipositor slender, its tip about 4.9 times as long as high and ventrally with very fine teeth.

Coloration: black. Antennal segments 6 apically and 7–9 white dorsally. Basal 4 to 5 antennal segments (segments 4 and 5 can be black apically), clypeus ventrally, mandible, pronotum partly, sometimes mesoscutum partly, sometimes scutellum, sometimes mesopleuron partly, sometimes metathorax partly, legs, sometimes first segment of gaster basally, postpetiole apically, second and third tergites of gaster orange. Tegula yellowish. Wings infusate. Pterostigma of fore wing brown.

Body length 3.5–4.1 mm.

Male unknown.

**Etymology.** Named after Francesca Shaw, wife of the second author.

***Orthizema graviceps*** (Marshall, 1868)

This species was listed by Fitton *et al.* (1978) in *Aptesis* Foerster. *Orthizema nigriventre* Horstmann (q.v.) may be a synonym (relating to larger, darker individuals that are sometimes macropterous, in contrast with the seemingly always brachypterous females of *O. graviceps*).

There are 9 ♂ from two Scottish sites, Dunbartonshire, Caldarvan (V.C. 99) and Jura, Ardlussa (V.C. 102), collected in (?v)vi(?vii) that we tentatively identify as the hitherto unknown male. We are listing them as *O. graviceps* rather than *O. nigriventre* because only the former has been recorded as British.

***Orthizema hadrocerum*** (Thomson, 1884)

Many specimens. **England:** V.C.s 12, 18, 23, 24, 28, 29. **Scotland:** V.C.s 89, 95, 96. **Finland:** Pohjois-Savo. Specimens collected in v(?vi), from vii–viii and in ix/x.

***Orthizema mandibulare*** Horstmann, 1993

**Belgium:** 1 ♀, Malle, ex case of Adelidae (Lepidoptera) coll. 25.iii.1998, em. 3.iv.1998 (*R. J. Heckford*).

***Orthizema nigriventre*** Horstmann, 1992

See also remarks under *O. graviceps*.

**France:** 1 ♀, Lot-et-Garrone, Bernac, 8–18.viii.1991 (*R. R. Askew*); 1 ♀, Dordogne, St Marcel du Perigord, 15–27.ix.2007 (*R. R. Askew*); 1 ♀, Lot, Crayssac, 1.viii.1990 (*M. R. Shaw*). All three specimens are macropterous.

***Orthizema subannulatum*** (Bridgman, 1883)

We have not scored a proportion of females that are either this or *O. triannulatum* (Thomson) that could not be certainly separated, nor males of the two species (apart from those reared alongside females of *O. subannulatum*), which are also regarded as doubtfully separable. The two species, if indeed they are distinct, differ only slightly in the length of the basal antennal segments, with partial overlap, and often co-occur in Britain, in more or less wooded habitats.

Numerous specimens. **England:** V.C.s 3, 7, 11, 22, 24, 28, 36. **Scotland:** V.C.s 73, 80, 83, 88, 92, 96, 99, 102, 105. Specimens collected from (?iv)v–viii(?ix). Reared from virtually mature cases of Lepidoptera, Incurvariidae and Adelidae coll. from ii–iv, em. from iii–v, as follows. *Incurvaria pectinea* (Haworth) (*K. P. Bland*; *R. J. Heckford*) (10), *I. pectinea* or *Adela rearmurella* (Linnaeus) (*J. R. Langmaid*) (1), *A. rearmurella* (*K. P. Bland*) (1), *Nemophora degeerella* (Linnaeus) (*K. P. Bland*) (1), *Nematopogon schwarziellus* (Zeller) (*K. P. Bland*) (3), and ‘*Incurvaria* sp.’ (*P. H. Sterling*) (2). These hosts all feed in leaf litter. The apparently sharp phenology seen in the rearing data may be largely the result of the time of year when lepidopterists look for incurvariid cases, which are presumably attacked in the autumn, but nevertheless the flight period of the adults is puzzling, and it seems possible that a different midsummer host may also be involved.

***Orthizema triannulatum*** (Thomson, 1884).

See remarks under *O. subannulatum* (Bridgman).

Numerous specimens. **England:** V.C.s 5, 7, 12, 17, 23, 29, 58. **Scotland:** V.C.s 89, 92, 95, 96, 99, 105. Specimens collected from v– ix(?x).

***Tricholinum ischnocerum*** (Thomson, 1888)

This species is here recorded as British for the first time. Several specimens. **England:** V.C.s 17, 23, 68, 69. **Wales:** V.C. 45. **Scotland:** V.C.s 83, 106. Female specimens collected from v–vi, and a single male in iii. British material in BMNH, collected from iii–vi and det. J. F. Perkins and G. Broad, adds the following additional distribution records. **England:** V.C.s 1, 20, 31. **Scotland:** V.C. 96. (G. Broad, pers. comm.).

***Uchidella brevicauda*** Horstmann, 1993

Horstmann (1993b) included paratypes from Scotland, six of which are in the NMS collection, in his description of this species.

Many specimens. **England:** V.C.s 27, 29, 58. **Scotland:** V.C.s 89, 95, 96, 99, 105, 106. Specimens collected from (?v)vi–vii(?viii), in viii/ix and from (?viii)ix–x.

***Uchidella flavilabris*** Horstmann, 1993

This species is here recorded as British for the first time. **England:** 2 ♀, Cheshire, Abbots Moss, SJ5868 (V.C. 58), 27.vi–23.vii.1986 (*R. R. Askew*); 1 ♂, Cambridgeshire, Chippenham Fen NNR, TL6569 (V.C. 29), 25.viii–5.ix.1983 (*J. Field*). **Scotland:** 1 ♀, Wester Ross, Kishorn, NG8338 (V.C. 105), vi.1987 (*P. W. Brown*); 1 ♀, Inverness-shire, Abernethy Forest (V.C. 95), 23–30.vi.1988 (*D. Phillips*).

***Uchidella longicaudata*** Horstmann, 1997 (= *longicauda* Horstmann, 1993, preocc.)

This species is here recorded as British for the first time. **England:** 1 ♀, Herefordshire, Moccas Park NNR (V.C. 36), mature deciduous woodland, 3–8.vi.1992 (*J. Cooter*). **Scotland:** 1 ♀, 1 ♂, Perthshire, Errol, Paddockmuir Wood (V.C. 89), 12–22.vi.1987 (1 ♂) and 16–23.vii.1987 (1 ♀) (*D. Phillips*). In BMNH are a further two males, det. G. Broad, from **England:** Gloucestershire, Staunton, High Meadow Woods (V.C. 34), 7.vi.1936 (*E. B. Benson & J. F. Perkins*) (G. Broad, pers. comm.).

***Leptocryptoides clavipes*** (Thomson, 1888)

This species is here recorded as British for the first time. **England:** 1 ♀, Norfolk, Catfield, TG3720 (V.C. 27), abandoned grazing marsh, 17–29.viii.1983 (*R. T. J. Jarvis*). Two further specimens from the British Isles, both correctly identified by J. F. Perkins (as *Ischnurgops*) in respectively 1948 and 1961, have recently been located in the BMNH by G. Broad (pers. comm.): **Ireland:** 1 ♀, Co. Leix, Tullagham (V.C. H.14), x.1937 (*A. W. Stelfox*); **England:** 1 ♀, Surrey, Bookham (V.C. 17), 7.vii.1961, ex cocoon *Gyrinus natator* (Linnaeus) (Coleoptera: Gyrinidae) (*A. Eve*).

***Gnotus chionops*** (Gravenhorst, 1829)

Numerous specimens. **England:** V.C. 3, 7, 15, 27, 28, 40, 58. **Scotland:** V.C. 81, 84, 88, 89, 96, 97, 99, 105, 106. **France:** Lot-et-Garonne. Specimens collected from v–xi, mostly in scrub or woodland. Reared from a cocoon of *Swammerdamia pyrella* (Villers) (Lepidoptera: Yponomeutidae) on *Malus* (*M. R. Shaw*) (1). The cocoon was collected in viii and the parasitoid emerged in the same month.



**Figs 24–29.** Western Palearctic Cryptinae. 24, 25, hind tibia in lateral view: 24, *Orthizema francescae* sp. nov., paratype ♀; 25, *Orthizema* sp. 3, ♀. 26–29, *Stibeutes blandi* sp. nov., holotype, ♀: 26, habitus laterally; 27, head and mesoscutum in dorsal view; 28, propodeum in dorsolateral view; 29, first and second tergites of gaster.

***Gnotus plectisciformis*** (Schmiedeknecht, 1897)

**France:** 1 ♀, Vaucluse, Mt Ventoux, 1400m, 10.vii.1998 (*M. R. Shaw*); 1 ♀, Dordogne, St Alvère, 24.v–16.vii.2000 (*R. R. Askew*). **Hungary:** 1 ♀, Simontornya, 22.vi.1911.

***Gnotus rugosus*** Horstmann, 1993

**France:** 2 ♀, Lot-et-Garonne, Bernac, 26–30.vi.1992 and 1–11.vii.1992 (*R. R. Askew*).

***Gnotus tenuipes*** (Gravenhorst, 1829)

**France:** 6 ♀, Dordogne, St Alvère, 1–21.v.1999 (1 ♀), 30.vii–15.viii.1999 (2 ♀), 8–23.vii.2001 (2 ♀) and 21.v–15.vi.2004 (1 ♀) (*R. R. Askew*); 1 ♀, Dordogne, St Marcel du Perigord, 10–31.viii.2007 (*R. R. Askew*). **Austria:** 1 ♀, Salzburg-Stadt, 27.vii.1989 (*M. Schwarz*).

***Stibeutes blandi* sp. nov.** (Figs 2, 26–29)

Holotype (♀): 'SCOTLAND: VC 89. Perthshire, Cairnwell NO127781, calcareous area, 820m 9.ix.2006 K. P. Bland' (in National Museums of Scotland, Edinburgh).

*Stibeutes blandi* sp. nov. is a rather distinct species whose taxonomic position is doubtful. Because it keys rather well to *Stibeutes* using Townes' (1970) key it is described here in that genus. *Stibeutes blandi* sp. nov. has the first tergite of the gaster with distinct striation and thus agrees with the *Stibeutes breviareolatus* group sensu Horstmann (2010). But the new species clearly differs from the other known species of this group by its distinctly granulated frons and mesoscutum, by its distinct median dorsal carinae on the first segment of the gaster and by other characters. Therefore it should be placed in its own species group.

Female. Antenna slender, with 25 segments; third segment 2.9 times and sixth segment 2.0 times as long as wide. Face, temple and frons with very distinct granulation and matt. Face with rather indistinct punctation. Clypeus of moderate width, 2.3 times as wide as long, moderately convex, rather weakly granulate, somewhat lustrous above and with a smooth background below, with scattered and distinct punctures. Lower margin of clypeus depressed and without teeth. Upper tooth of mandible somewhat longer than lower tooth. Malar space 1.0 times as long as basal width of mandible. Temple with scattered and somewhat indistinct punctures. Frons with moderate and flat punctures, distances between the punctures about as long as diameter of punctures. Head behind the eyes weakly rounded and weakly narrowed.

Pronotum with distinct epomia. Mesoscutum with distinct granulation and matt, in addition with moderate and somewhat flat punctures (Fig. 27). Notaulus distinct, but short. Scutellum densely punctured and without distinct granulation. Mesopleuron except speculum with rather coarse transverse striation and lustrous. Speculum granulate. Sternaulus with transverse ridges. Mesosternon granulate. Postpectal carina of mesosternon broadly interrupted in front of middle coxa. Metapleuron rugose and granulate.

Propodeum (Fig. 28) with all carinae distinct. Area superomedia hexagonal with anterior side narrow and with costula a little behind its middle. Apical transverse carina with a distinct lobe sublaterally. Dorsal part of propodeum weakly granulate and lustrous.



Hind femur 4.5 times as long as wide. Hind tarsus with second segment 1.6 times as long as fifth segment.

Fore wing (Fig. 26) with areolet open (i.e. second intercubitus absent). Second recurrent vein with two distinctly separated bullae. Nervulus about opposite basal vein. Nervellus in hind wing inclivous and intercepted below the middle (Fig. 26). First segment of gaster slender and of moderate width apically. Median dorsal carinae very distinct, its hind edge close to hind margin of postpetiole (Fig. 29). Postpetiole with longitudinal striation, with granulation and with some indistinct punctures. Second tergite of gaster distinctly granulate and with distinct longitudinal striation nearly to its hind margin (Fig. 29). Third tergite of gaster granulate and in its basal half with striation, which is mainly transverse.

Ovipositor sheath about 0.8 times as long as hind tibia. Ovipositor (which is similar to that of *Theroscopus megacephalus* (Schjødt)) slender and with a distinct nodus (Fig. 2). Ovipositor tip about 5.0 times as long as high, ventrally with distinct and moderately strong teeth.

Coloration: black. Most of legs and tergites 1–3 of gaster orange. Base of postpetiole blackish. Parts of fore and middle coxae, most of fore and middle trochanters, hind femur dorsoapically and hind tibia apically dark brown. Palpi brown. Basal segments of antenna (especially below) reddish. Pterostigma brown, basally and apically narrowly whitish.

Body length: 5.0 mm.

Male unknown.

**Etymology.** Named after the collector Keith Bland, who has done so much to enrich the NMS insect collections.

***Stibeutes brevicornis* (Lange, 1911)**

Horstmann (2010) recorded this species from England, partly on the basis of the specimen below.

**England:** 1 ♀, Northumberland, Gloster (V.C. 67) (*P. Cameron*). The specimen, which was presumably collected around 1900, was determined by K. Horstmann.

***Stibeutes curvoispina* (Thomson, 1884)**

Several specimens. **England:** V.C.s 28, 29. **Wales:** V.C. 52. **France:** Dordogne. Specimens collected from v–vi(vii) and in viii/ix.

***Stibeutes gravenhorstii* Foerster, 1850**

1 ♀, presumed British but without locality data, from C. Morley's collection.

***Stibeutes heinemanni* Foerster, 1850**

Many specimens. **England:** V.C.s 7, 22, 28, 29. **Scotland:** V.C.s 89, 96. Specimens collected from vi–viii(?ix). Females are macropterous or brachypterous in this species, but all ten British females in NMS are macropterous.

***Stibeutes heterogaster* (Thomson, 1885)**

Horstmann (2010) recorded this species from England and Scotland, partly on the basis of the specimens below.

Numerous specimens. **England:** V.C.s 7, 22, 23, 27, 28, 29, 58, 62. **Wales:** V.C. 52. **Isle of Man:** V.C. 71. **Scotland:** V.C.s 88, 89, 92, 97. Specimens collected from (?v)vi–ix, mostly in fens and wet moorland.

***Stibeutes rugiventris*** (Strobl, 1901)

**France:** 1 ♂, Lot-et-Garonne, Bernac, 26.vi–3.vii.1991 (*R. R. Askeew*). The specimen was determined by K. Horstmann.

***Theroscopus*** Foerster, 1850

Most males of this genus remain unidentified, and some will not have been distinguished from unidentified material provisionally sorted to *Phygadeuon* Gravenhorst. As we describe new species of *Theroscopus* in this paper, we provide a key for the macropterous females of the European species. We have not seen specimens of *T. boreaphilus* (Hellén): this species is included on the basis of a description of the holotype made by K. Horstmann (pers. comm.). The characters separating *T. pullator* (Gravenhorst) and *T. opaciotum* (Hellén) are partly based on notes also received from K. Horstmann.

The separation of *Theroscopus* and *Phygadeuon* is arbitrary. Some species like *Ph. gracilentus* Horstmann, *Ph. palus* sp. nov. and *T. alpator* Aubert are morphologically more or less intermediate. While all species of *Phygadeuon* with known hosts are parasitoids of Diptera: Brachycera, species of *Theroscopus* whose hosts are known are parasitoids of various cocoons, including those of Ichneumonoidea (cf. Horstmann, 1993a). [Horstmann (1970) lists *Digonochaeta setipennis* (Fallén) (= *Triarthria setipennis*) (Diptera: Tachinidae), which parasitises *Forficula auricularia* L. (Dermaptera), as host of *Theroscopus hemipteron*, which is an exceptional host for a *Theroscopus* species. However, it is possible that *Phygadeuon vexator* (Thunberg), a parasitoid of this tachinid, was the real host of *T. hemipteron* rather than the tachinid (K. Horstmann, pers. comm.).] The correct generic placement of some species will only be possible when their hosts are known – presuming, of course, that the difference in host associations reflects phylogeny. On the grounds of host records listed below we transfer *Hemiteles melanopygus* Gravenhorst, which is similar to *Ph. palus* sp. nov., from *Theroscopus* to *Phygadeuon*. The species *T. unguularis* (Thomson), *T. ochrogaster* (Thomson) and *T. mariae* sp. nov., which have robust ovipositors and heads only very weakly narrowed behind the eyes, are possibly related to *Ph. gracilentus* Horstmann and should perhaps also be transferred to *Phygadeuon* eventually. Their hosts are unknown, however, and therefore for the moment we leave (or describe) them in *Theroscopus*. The key below includes some undescribed species which will be described in another paper (Schwarz, in prep.) and some species of *Phygadeuon* that are particularly similar to *Theroscopus*, in part also to accommodate a new species in that genus. See also comments under *Orthizema*.

**Key to females of the European species of *Theroscopus* with macropterous females, including some closely similar species of *Phygadeuon***

- 1 Antenna with a white ring. Ovipositor very slender and with distinct teeth (Fig. 3). Ovipositor sheath longer than hind tibia. . . . ***T. megacentrus*** (Schjødt)
- Antenna without a white ring. Ovipositor varying from very slender to very

- strong; if ovipositor very slender than without distinct teeth (Figs 4–11). Ovipositor sheath shorter or longer than hind tibia. . . . . 2
- 2 Fifth segments of tarsi distinctly enlarged, hind tarsus with fifth segment longer and wider than second segment (Fig. 18). Head behind the eyes hardly narrowed. Ovipositor sheath somewhat longer than hind tibia. . . . .  
. . . . . *T. unguularis* (Thomson)
- Fifth segments of tarsi not or only a little enlarged, hind tarsus with fifth segment shorter than second segment and at most a little wider than second segment. Ovipositor sheath shorter or longer than hind tibia. Head behind the eyes varying from distinctly to hardly narrowed. . . . . 3
- 3 Head and thorax with conspicuous long black hairs, vertex with hairs longer than diameter of third segment of antenna. Antenna black basally. Hind femur black. Frons distinctly granulate. Wings hyaline and without brown patches. . . . .  
. . . . . *T. alpator* Aubert
- Head and thorax with hairs shorter, hairs often whitish, vertex with hairs at most as long as diameter of third segment of antenna. In most cases base of antenna entirely or partly orange or yellowish. Hind femur usually orange. Frons distinctly granulate or with a smooth background. Wings entirely hyaline, or with brown patches, or extensively brown. . . . . 4
- 4 Postpetiole wide and with fine but distinct longitudinal striation (Fig. 33). Second tergite of gaster with granulation and with more or less distinct longitudinal striae or ridges. Third segment of antenna 2.1–2.5 times as long as wide. Lower margin of clypeus in nearly all cases blunt, at least medially. . . . .  
. . . . . *T. horsfieldi* sp. nov.
- Postpetiole narrow or wide, with or without longitudinal striation. Second tergite of gaster usually without and more rarely with granulation and very rarely with more or less distinct longitudinal striae or ridges (in the last case third segment of antenna slenderer). Lower margin of clypeus sharp. . . . . 5
- 5 Inner side of pedicel widened apically (Fig. 17). . . . . 6
- Inner side of pedicel not widened apically. . . . . 7
- 6 Frons with a smooth background. Third segment of antenna 3.8–4.4 times as long as wide. . . . . *T. rufulus* (Gmelin)
- Frons distinctly granulate. Third segment of antenna 3.1–3.2 times as long as wide. . . . . *T. pedicellatus* Horstmann
- 7 Fore wing with a distinct brown band subapically, or most of fore wing brown but with a light patch below proximal part of pterostigma. Ovipositor sheath nearly always at least 0.9 times as long as hind tibia. . . . . 8
- Fore wing not darkened and without a brown band subapically, but very rarely uniformly darkened. Ovipositor sheath in most cases less than 0.9 times as long as hind tibia. . . . . 17
- 8 Ovipositor tip without teeth. . . . . *T. corsicator* (Aubert)
- Ovipositor tip with distinct teeth ventrally. . . . . 9
- 9 Antenna widened in its middle and flattened below; antenna distinctly attenuated apically. Propodeum distinctly granulate. Basal segments of flagellum yellowish. . . . . *Therospopus* sp. 1

- Antenna not or moderately widened in its middle and never distinctly flattened below, if antenna widened in its middle then not attenuated apically. Propodeum usually without granulation. Basal segments of flagellum orange or black or rarely yellowish. . . . . 10
- 10 Basal segments of flagellum yellowish. Postpetiole except hind margin distinctly granulate and without distinct longitudinal striation. Ovipositor tip with distance between second and third teeth about two times as long as distance between first and second teeth. . . . . *Theroscopus* sp. 2
- Basal segments of flagellum orange. Postpetiole usually without distinct granulation, but often with distinct longitudinal striation. Ovipositor tip with distance between second and third teeth about as long as or shorter than distance between first and second teeth. . . . . 11
- 11 Frons and second tergite of gaster distinctly granulate. Hind tibia slender. . . . . 12
- Frons and second tergite of gaster not granulate or at most very weakly granulate (in the last case hind tibia wide (Fig. 40)). . . . . 13
- 12 Propodeum lustrous and without granulation. Ovipositor tip about 3.3 times as long as high. . . . . *Theroscopus* sp. 3
- Propodeum with distinct granulation and matt. Ovipositor tip very short, 2.5 times as long as high (Fig. 11). . . . . *Theroscopus* sp. 6
- 13 Propodeum with apophysis robust (Fig. 41). Head behind the eyes as seen from above hardly narrowed. Frons with coarse punctures and with white hairs. . . . . *T. lamelliger* (Smits van Burgst)
- Propodeum with apophysis absent or moderate. Head behind the eyes as seen from above distinctly narrowed. Frons with fine or rarely moderate punctures and with brown or white hairs. . . . . 14
- 14 Head dorsally and mesoscutum with thick brown hairs. . . . . *T. hemipteron* (Riche)
- Head dorsally and mesoscutum with fine white hairs. . . . . 15
- 15 Hind tibia wide (Fig. 40). . . . . *Theroscopus* sp. 4
- Hind tibia slender. . . . . 16
- 16 Fore wing with a distinct dark band subapically. Upper frons with hairs long, about as long as diameter of an ocellus. Mesopleuron medially with scattered punctation and without striation, distinctly lustrous. . . . . *T. fasciatulus* Horstmann
- Fore wing with a rather indistinct dark band subapically. Upper frons with hairs short, about half as long as diameter of an ocellus. Mesopleuron medially with punctation and striation and hardly lustrous. (Third antennal segment 2.3–2.4 times as long as wide; if about 3.8–4.2 times as long as wide then compare *T. cf. rufulus* (Gmelin)). . . . . *Theroscopus* sp. 5
- 17 Ovipositor tip ventrally without distinct teeth (Fig. 4). Third segment of antenna about 3.8–5.0 times as long as wide. . . . . 18
- Ovipositor tip ventrally with distinct teeth (Figs 5–10). Third segment of antenna about 2.6–4.2 times as long as wide. . . . . 19

- 18 Frons distinctly granulate and more or less matt. Head seen from above more strongly transverse, 0.50–0.53 times as long as wide. Head behind the eyes strongly or moderately narrowed. Scape distinctly orange below and basal segments of flagellum (except narrow base of third segment) entirely black. . . . . ***T. pullator*** (Gravenhorst)
- Frons with a smooth background or weakly granulated and more or less lustrous. Head seen from above less transverse, 0.54–0.58 times as long as wide. Head behind the eyes weakly narrowed or moderately narrowed. Basal segments of flagellum often orange to a variable extent and/or scape black or rather indistinctly orange below. . . . . ***T. opacinotum*** (Hellén)
- 19 Antenna dark brown basally. Ovipositor sheath about as long as hind tibia. . . . . ***T. boreaphilus*** (Hellén)
- Antenna orange or whitish basally. Ovipositor sheath 0.6–1.0 times as long as hind tibia. . . . . 20
- 20 Ovipositor very robust and its tip without a nodus (Fig. 5). Hind tibia with long hairs dorsally, which are nearly as long as outer spur of hind tibia. . . . . ***T. mariae* sp. nov.**
- Ovipositor robust or moderately robust and its tip with a nodus (Figs 6–10). Hind tibia with hairs dorsally, in most cases distinctly shorter than outer spur of hind tibia. . . . . 21
- 21 Third segment of antenna 3.8–4.2 times as long as wide. Ovipositor tip slender, about 4.2 times as long as high and with a distinctly raised nodus. (If ovipositor tip slender and with distinctly raised nodus but third antennal segment only about 2.3–2.4 times as long as wide then compare *Theroscopus* sp. 5.). . . . . ***T. cf. rufulus*** (Gmelin)
- Third segment of antenna 2.4–3.5 times as long as wide. Ovipositor tip more robust and usually not distinctly raised (Figs 6, 7, 9, 10), if nodus distinctly raised then ovipositor tip short, 2.2–2.4 times as long as high (Fig. 8). . . . . 22
- 22 Basal flagellar segments whitish below. Ovipositor tip as in Fig. 10. . . . . ***T. naninae* sp. nov.**
- Basal flagellar segments orange. Ovipositor tip as in Figs 6–9. . . . . 23
- 23 Nodus comparatively strongly raised (Fig. 8). Head behind the eyes strongly or moderately strongly narrowed. . . . . ***Ph. melanopygus*** (Gravenhorst)
- Nodus hardly raised (Figs 6, 7, 9). Head behind the eyes weakly or hardly narrowed. . . . . 24
- 24 Malar space 1.2–1.5 times as long as basal width of mandible. Head behind the eyes in most cases weakly rounded (Fig. 42). . . . . ***Ph. palus* sp. nov.**
- Malar space 0.9–1.0 times as long as basal width of mandible. Head behind the eyes strongly rounded (Fig. 39). . . . . 25
- 25 Third segment of antenna 2.8–3.1 times as long as wide. Propodeum with area superomedia 0.8–1.4 times as long as wide. Ovipositor tip with nodus usually with a small notch and behind this with a small protuberance (Fig. 6). In nearly all cases at least second and third segments of gaster entirely orange. . . . . ***T. ochrogaster*** (Thomson)
- Third segment of antenna 2.3–2.6 times as long as wide. Propodeum with area

superomedia 1.2–1.3 times as long as wide. Ovipositor tip with nodus usually without a small notch and behind without a small protuberance (Fig. 7). Gaster with at most second tergite and base of third tergite orange. . . . .  
 . . . . . *Ph. gracilentus* Horstmann

***Theroscopus bonelli*** (Gravenhorst, 1815)

Horstmann (1993a) recorded this species from England.

**Wales:** 1 ♀, Dyfed, Coed Rheidol NNR, SN7477 (V.C. 46), 19.viii–2.ix.1988 (*A. P. Fowles*).

***Theroscopus esenbeckii*** (Gravenhorst, 1815) (= *subzonatus* (Gravenhorst, 1815); = *gravenhorstii* (Ratzeburg, 1844); = *inaequalis* Foerster, 1850)

This species was listed four times by Fitton *et al.* (1978) as doubtfully placed species of *Hemiteles* Gravenhorst.

Many specimens. **England:** V.C.s 9, 12, 15, 18, 40, 62, 67. **Wales:** V.C. 46. **Scotland:** V.C.s 83, 90, 103, 110, 111, 112 (Fair Isle). Specimens collected in vi/vii and from viii–x in boggy areas. Reared from cocoons of Lepidoptera, Incurvariidae: *Incurvaria pectinea* Haworth, coll. iii, em. vi (*K. P. Bland*) (1); Gracillariidae: *Calybites phasianipennella* (Hübner), coll. ix, em. ix/x (*J. R. Langmaid*) (1), *Aspilapteryx tringipennella* (Zeller) coll. vi, em. vi (*K. P. Bland*) (1); Tortricidae: *Cnephasia conspersana* Douglas, coll. vii, em. viii (*K. P. Bland*) (2), *Acleris hastiana* (Linnaeus) or *Ancylis subarcuana* (Douglas), coll. viii, em. ix (*M. F. V. Corley*) (1); and from a cocoon of ?*Banchus* sp. (Hymenoptera: Ichneumonidae) coll. vi, em. vii (*M. R. Shaw*) (1).

***Theroscopus fasciatulus*** Horstmann, 1979 (= *fasciatus* (Thomson, 1884))

This species was listed by Fitton *et al.* (1978) as a doubtfully placed species of *Hemiteles* Gravenhorst.

**England:** 1 ♀, Wiltshire, Savernake Forest, SU2176 (V.C. 7), 31.v.1990 (*K. Porter/NCC*); 1 ♀, Oxfordshire, Wychwood Forest, SP3417 (V.C. 23), 17.vii–14.viii.1990 (*K. Porter/NCC*); 1 ♀, Buckinghamshire, Burnham Beeches, Pumpkin Hill, SU9484 (V.C. 24), 5–31.viii.1996 (*J. W. Ismay*); 1 ♀, Cheshire, Abotts Moss, SJ5868 (V.C. 58), 5–25.viii.1986 (*R. R. Askeew*).

***Theroscopus hemipteron*** (Riche, 1791) (= *hemipterus* (Fabricius, 1793); = *scrupulosus* (Gravenhorst, 1829))

This species was listed twice by Fitton *et al.* (1978), once as a doubtfully placed species of *Hemiteles* Gravenhorst.

Many specimens. **England:** V.C.s 9, 22, 27. **Wales:** V.C. 46. **Scotland:** V.C.s 82, 103, 105. **Ireland:** V.C. H.30. **France:** Dordogne. **Germany:** Baden-Württemberg. **Madeira.** Specimens collected from vii–viii (British Isles), in v (France) and in iv (Madeira). Reared from a cocoon of *Osmia aurulenta* (Panzer) (Hymenoptera: Apidae) coll. in a *Helix* shell iii, em. iii (*G. R. Else*) (1), from a cocoon (possibly its own) associated with *Cynaeda dentalis* ([Denis & Schiffermüller]) (Lepidoptera: Pyralidae) (*M. Parsons*) (1), and 7 ♀ from a single cocoon of *Saturnia pavonia* (Linnaeus) (Lepidoptera: Saturniidae) coll. iv, em. iv (forced), from which the gregarious cryptine ichneumonid *Agrothereutes saturniae* (Boie) also emerged, of which it was probably a parasitoid (*M. T. Jennings*).



**Figs 30–36.** Western Palaearctic Cryptinae. 30–33, *Theroscopus horsfieldi* sp. nov., paratype ♀: 30, habitus laterally; 31, head in dorsal view; 32, face and clypeus; 33, base of gaster. 34–36, *Theroscopus mariae* sp. nov., paratype ♀: 34, habitus laterally; 35, head in dorsal view; 36, hind tibia in lateral view.

***Theroscopus horsfieldi* sp. nov.** (Figs 30–33)

Holotype (♀): [Scotland: Inverness-shire] 'Creag Meagaidh (7) NN417848 610m *Vaccinium myrtillus* heath 18.6.–10.7.1983 D. Horsfield' (in National Museums of Scotland, Edinburgh).

Paratypes (17 ♀, 3 ♂): **Scotland:** 6 ♀, 1 ♂, Creag Meagaidh, NN4284 (V.C. 97), 510 m, 17.vi–9.vii.1983 (*D. Horsfield*); 2 ♀, Creag Meagaidh, NN 4185 (V.C. 97), 885 m, *Rhacomitrium* heath, 18.vi–10.vii.1983 (*D. Horsfield*); 1 ♀, Creag Meagaidh, NN 4286 (V.C. 97), 975 m, *Nardus stricta* snow bed, 18.vi–10.vii.1983 (*D. Horsfield*); 2 ♂, Creag Meagaidh, NN 4184 (V.C. 97), 610 m, *Vaccinium myrtillus* heath, 18.vi–10.vii.1983 (*D. Horsfield*); 1 ♀, Inverness-shire, Cairn Gorm (V.C. 96), 15–26.vi.1938 (*A. R. Waterston*); 1 ♀, Dunbartonshire, Caldarvan, NS 4483 (V.C. 99), *Betula/Myrica*, 8–20.vi.83 (*I. C. Christie*); 1 ♀, Perthshire, Meall nam Tarmachan (V.C. 88), 800 m, 26.vi.1996 (*K. P. Bland*) (all the foregoing in NMS). **Austria:** 2 ♀, Salzburg, Hohe Tauern, Edelweißspitze, 47°07'N, 12°50'E, 2400–2570 m, 28.vii.2001 (*M. Schwarz*) (in coll. Schwarz); 1 ♀, Kärnten, Hohe Tauern, Tauerneck, 47°04'N, 12°49'E, 2050–2300 m, 1.viii.1995 (*M. Schwarz*) (in coll. Schwarz); 1 ♀, Kärnten, Hohe Tauern, In den Wänden, 47°04'N, 12°51'E, 2500–2550 m, 3.viii.1995 (*M. Schwarz*) (in coll. Schwarz).

This species is unique among the European species of *Theroscopus* on account of its blunt clypeus, and it is not closely related to any other known European species. The wide postpetiole with fine striation (Fig. 33) is another distinctive character.

Female. Antenna moderately thick and with 21–24 segments; third segment 2.1–2.5 times and sixth segment 1.3–1.6 times as long as wide. Face granulate and with fine punctures. Clypeus (Fig. 32) without granulation and with fine or moderately fine punctures, moderately convex, its lower margin without or with only very small paired teeth. Lower margin of clypeus not or only weakly (in nearly all cases except medially) depressed and therefore lower margin blunt, but in one small specimen distinctly depressed and thus lower margin sharp. Upper tooth of mandible somewhat longer than lower tooth. Malar space 1.0–1.4 times as long as basal width of mandible. Temple with weak granulation, which is sometimes hardly recognisable, and with fine scattered punctures. Frons granulate, with fine or moderately fine scattered punctures, often medially with a weak elevation which is about V-shaped. Head behind the eyes rounded and hardly narrowed (Fig. 31). Mesoscutum with a mainly smooth background, but some parts (near notaulus and at the centre) weakly granulate; mesoscutum with fine, or moderately fine, and somewhat scattered punctures. Notaulus short and usually only moderately distinct. Scutellum with scattered punctures, sometimes with distinct striae apically. Mesopleuron varying from nearly entirely with conspicuous transverse striation to having only some weak striae, in addition to the striation there are a few punctures, and there is also weak granulation behind; in front of speculum striation is often absent, but distinct punctures can be present. Sternaulus in its front half deep and with fine transverse ridges. Metapleuron finely rugose or granulate. Propodeum of moderate length and with all carinae present, anterodorsally with a more or less smooth background; the sculpture is more distinct apically than basally; propodeum apically sometimes finely rugose or distinctly granulate. Area superomedia 0.6–1.2 times as long as wide. Costula at or somewhat behind the middle of the area superomedia. Second pleural area of propodeum finely rugose or granulate, sometimes with some striae. Hind femur 3.5–4.2 times as long as wide. Tibiae without long hairs. Last tarsal segments not enlarged.



Fore wing with radial cell short. Radius beyond areolet bent. Areolet open with second intercubitus absent. Second recurrent vein with two distinctly separated bullae. Second discoidal cell with posterodistal corner at nearly a right angle. Nervulus distad of basal vein. Nervellus in hind wing intercepted at, or only a little below or a little above, the middle.

First segment of gaster (Fig. 33) wide apically and with fine median dorsal carinae. Postpetiole with fine longitudinal striae and granulate. Second tergite of gaster (Fig. 33) except hind margin distinctly granulate and longitudinally striate or with fine longitudinal ridges developed to a varying extent, in addition with scattered punctures. Third tergite of gaster lustrous and with very fine granulation (often hardly recognisable). Ovipositor sheath 0.6–0.7 times as long as hind tibia. Ovipositor moderately robust and with a distinct nodus, nodus sometimes with a small notch. Ovipositor tip 2.9–3.2 times as long as high, ventrally with distinct and moderately robust teeth.

Coloration: black. Basal 5 or 6 segments of antenna entirely or partly black (in some cases scape entirely black), rarely face medially, mandible partly, often tegula, legs entirely or partly (see below), tergites 2–3 or 2–4 of gaster, sometimes narrow hind margins of the apical tergites orange. Fore wing entirely or partly brownish. Pterostigma brown, white basally and apically. Palpi dark brown. Tegula black in some specimens. Second and third tergites of gaster can be black with orange only basally.

Specimens from Scotland have legs entirely orange or nearly so (hind coxa with its base or entire hind coxa can be black; one specimen has also parts of fore and middle coxae, parts of trochanters blackish and hind femur brown). Specimens from the Alps have more extensively dark legs, with fore coxa partly, middle and hind coxae, trochanters partly or entirely, parts of fore and middle femora, hind femur (except apically) black; hind tibia can be brown apically.

Body length: 3.5–5.6 mm.

Male. Similar to the female. Antenna with 22–23 segments; segments 12 or 13 to 15 with tyloids; third segment 2.3–2.7 times and sixth segment 1.4–1.7 times as long as wide. Malar space 0.9–1.1 times as long as basal width of mandible. Area superomedia 0.9–1.0 times as long as wide. Costula at or somewhat behind the middle of the area superomedia. Hind femur 3.7–3.8 times as long as wide. First segment of gaster less strongly widened apically than in the female.

Coloration: black. Most of mandible, gastral tergites 2–3 (tergite 2 sometimes partly black) and tergite 4 except laterally and most of legs orange. Legs with fore coxa partly, middle coxa mainly, hind coxa, trochanters and femora partly black or dark brown. Tegula brown or black. Fore wing brownish. Pterostigma brown, white basally and apically. Palpi dark brown.

Body length: 4.6–5.1 mm.

**Etymology.** Named after David Horsfield, who collected a large part of the type series.

***Theroscopus mariae* sp. nov.** (Figs 5, 34–36)

Holotype (♀): [Scotland] 'Caldarvan, Dumbs. NS 448838 Malaise trap, Betula/Myrica 31.8–19.9.83 I. C. Christie' [V.C. 99] (in National Museums of Scotland, Edinburgh).

Paratypes (12 ♀): **England:** 2 ♀, Oxfordshire, Barrow Farm Fen, SU4697 (V.C. 22), 19.viii–14.xi.1990 (*K. Porter/NCC*); 5 ♀, Shropshire, Whixall Moss (V.C. 40), ix.1991 (2 ♀) and x.1991 (3 ♀) (*S. Tilling*); 1 ♀, Surrey, Chobham Common (V.C. 17), 17.ix.1983 (*M. R.*

*Shaw*). **Scotland**: 2 ♀, Dunbartonshire, Caldervan, NS4483 (V.C. 99), 19–29.ix.1983 (*I. C. Christie*) (all the foregoing in NMS). **Austria**: 2 ♀, Oberösterreich, Wels, airfield, 48°10'N, 14°02'E, 17.ix.2007 (*M. Schwarz*) (in coll. Schwarz).

This species is similar to *T. ochrogaster* (Thomson) but differs by, among other characters, its coarse punctures, long hairs and its robust ovipositor without a nodus (Fig. 5). A good character for the new species is the presence of long erect hairs on the hind tibia as seen laterally (Fig. 36).

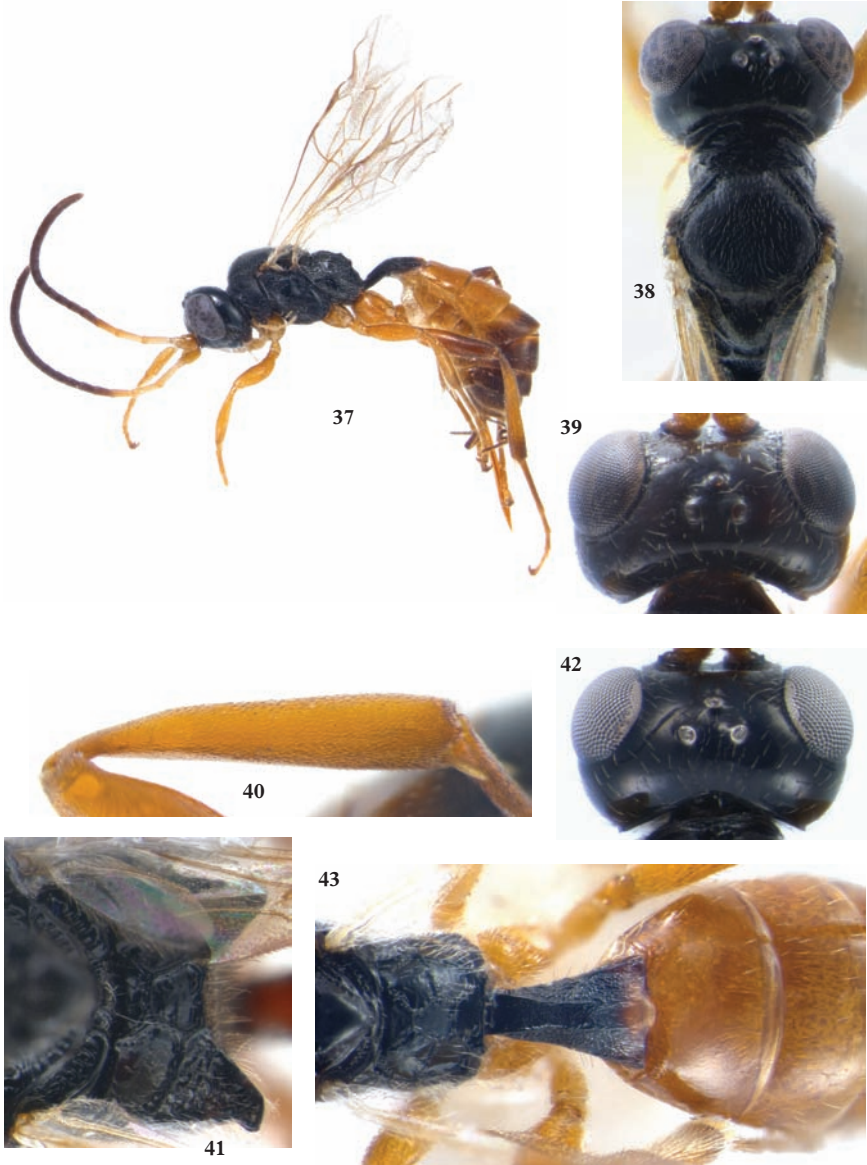
Female. Body including legs with long and erect white hairs; the longest hairs about 2 times as long as diameter of a lateral ocellus. Antenna thick and with 18–19 segments; third segment 2.4–2.6 times and sixth segment 1.2–1.5 times as long as wide. Head lustrous, only inner orbits and a narrow band on malar space granulate. Head usually with coarse, moderately coarse or rarely fine punctures. Face densely punctured, at least in some areas the distances between the punctures smaller than the diameter of the punctures. Frons with scattered punctures. Temple with very scattered punctures, distances between punctures many times the diameter of punctures. Clypeus not widened and with two sharp teeth. Upper tooth of mandible somewhat longer than lower tooth. Malar space 0.8 times as long as basal width of mandible. Head behind the eyes rounded and very weakly narrowed (Fig. 35).

Notaulus short but distinct. Mesoscutum lustrous and in its middle often granulate, with moderately coarse or coarse punctures, in its middle densely punctured, otherwise mesoscutum with scattered punctures. Scutellum with scattered punctures. Mesopleuron lustrous and with moderately coarse and scattered punctures, in addition mesopleuron with some transverse ridges. Mesopleuron with sternaulus in its front half deep and with transverse ridges. Metapleuron dorsally punctured, other parts with coarse rugosity. Propodeum of moderate length. Area superomedia hexagonal with anterior side narrower than posterior side, 0.8–0.9 times as long as wide, lustrous and with some punctures. Costula behind the middle of area superomedia. Second pleural area of propodeum rugose, in addition sometimes with punctures.

Fore wing with radial cell short. Radius behind areolet bent. Areolet closed with second intercubitus pale. Second discoidal cell with posterodistal corner at nearly a right angle. Nervulus distad of basal vein. Nervellus in hind wing reclivous and intercepted distinctly, or only a little, below the middle.

Hind femur 3.1–3.3 times as long as wide. Hind tibia with long erect hairs dorsally, these hairs longer than width of first segment of hind tarsus (Fig. 36). Last tarsal segments not enlarged.

Postpetiole of moderate width and granulate, entirely or only laterally with longitudinal striae, between the striae with some punctures. Second tergite of gaster except a wide hind margin finely granulate, somewhat lustrous and with scattered punctures, basally (variously extending) with fine longitudinal striae. Third tergite smooth, without granulation and without striae. Ovipositor sheath 0.9–1.0 times as long as hind tibia. Ovipositor very robust, with its tip slightly bent upwards. Ovipositor tip (Fig. 5) without nodus, but broadly rounded in profile; ovipositor tip about 2.2–2.5 times as long as high (because nodus is absent the length of the tip cannot be measured exactly); ovipositor tip in profile with a small protuberance subapically on upper side, teeth ventrally robust.



**Figs 37–43.** Western Palearctic Cryptinae. 37, 38, *Theroscopus naninae* sp. nov., holotype ♀: 37, habitus laterally; 38, head and mesoscutum in dorsal view. 39, *Theroscopus ochrogaster* (Thomson), ♀, head in dorsal view. 40, *Theroscopus* sp. 4, ♀, hind tibia in lateral view. 41, *Theroscopus lamelliger* (Smits van Burgst), ♀, propodeum. 42, 43, *Phygadeuon palus* sp. nov., paratype ♀: 42, head in dorsal view; 43, propodeum and base of gaster in dorsal view.

Coloration: black. Antennal segments 1–5 (the fifth segment apically variously extending darkened), mandible except teeth, palpi, tegula, tergites of gaster 2–3 or 2–4 and legs orange. Pterostigma brown, basally and apically white.

Body length: 3.5–4.9 mm.

Male unknown.

**Etymology.** Named after Maria Schwarz-Waubke, wife of the first author.

***Theroscopus megacentrus*** (Schjødt, 1839) (= *ornaticornis* (Schmiedeknecht, 1897); = *occisor* (Habermehl, 1923))

**England:** 1 ♀, Berkshire, Windsor Forest, SU9470 (V.C. 22), 10–26.iv.1992 (*K. Porter/NCC*); 1 ♀, Oxfordshire, Barrow Farm Fen, SU4697 (V.C. 22), 19.vi–19.vii.1990 (*K. Porter/NCC*). **Scotland:** 2 ♀, Argyll, Tainish NNR, NR7384 (V.C. 101), 10–26.vi.1984 (1 ♀) and 9.vii–5.viii.1984 (1 ♀) (*I. C. Christie*); 1 ♀, Wester Ross, Kishorn, NG8338 (V.C. 105), vii.1987 (*P. W. Brown*). Horstmann (1992) has recorded an English specimen reared from *Limnephilus sparsus* Curtis (Trichoptera: Limnephilidae).

***Theroscopus naninae* sp. nov.** (Figs 10, 37, 38)

Holotype (♀): [England] 'Walberswick O TM462733 11–25.8.88 E. Anglia Fen survey A. P. Foster/N.C.C. NMSZ 1992.161' [V.C. 25] (in National Museums of Scotland, Edinburgh).

This species has the basal flagellar segments whitish below, short whitish hairs, hyaline wings with no dark bands, and the ovipositor tip with an only weakly raised nodus and distinct teeth ventrally (Fig. 10). The only known specimen has the second recurrent vein with only one bulla, which may turn out to be a good character for this species.

Female. Body with short white hairs. Antenna slender, not distinctly thickened medially and with 19 segments; inner side of pedicel not widened apically; third segment 3.5 times and sixth segment 1.9 times as long as wide. Face granulate (except laterally) and with fine punctures. Clypeus not widened, with a smooth background and some fine punctures, lower margin sharp and with a pair of small teeth. Malar space 1.3 times as long as basal width of mandible. Temple smooth and with fine scattered hairs. Frons granulate and somewhat lustrous, with scattered punctures. Head behind the eyes strongly rounded and weakly narrowed (Fig. 38).

Notaulus short but distinct. Mesoscutum and scutellum lustrous and with fine punctures. Mesopleuron lustrous and with fine and scattered punctures, in addition mesopleuron with transverse ridges above and in its lower half. Speculum and mesopleuron below and in front of speculum without ridges. Mesopleuron with sternaulus in its front half deep and with transverse ridges. Metapleuron with some fine punctures and with some ridges behind. Propodeum of moderate length, with all carinae present except that basal area and area superomedia are confluent. Apical transverse carina a little more robust than other carinae. Area superomedia hexagonal, 1.1 times as long as wide, lustrous and with short striation at the margins. Costula about in the middle of area superomedia. Second lateral area of propodeum weakly granulate. Second pleural area of propodeum with rugosity. Fore wing with radial cell short. Radius behind areolet nearly straight. Areolet closed with second intercubitus present. Second recurrent vein with only one bulla.

Second discoidal cell with posterodistal corner at nearly a right angle. Nervulus distad of basal vein. Nervellus in hind wing intercepted below the middle.

Hind femur 4.1 times as long as wide. Hind tibia without long hairs dorsally. Last tarsal segments not enlarged.

First segment of gaster with very distinct median dorsal carinae. Postpetiole of moderate width and granulate (except hind margin), in addition with a few very weak longitudinal ridges. Second tergite of gaster except hind margin finely granulate, lustrous and with very scattered punctures. Third tergite smooth, without granulation. Ovipositor sheath 1.0 times as long as hind tibia. Ovipositor robust. Ovipositor tip (Fig. 10) with distinct and slightly raised nodus, ventrally with distinct teeth. Ovipositor tip about 3.4 times as long as high, in profile without a protuberance on upper side.

Coloration: black. Basal 5 segments of antenna (segments 2–5 whitish ventrally), mandible partly, palpi, tegula, postpetiole medioapically, tergites 2–3 and basal half of 4 of gaster and most of legs orange. Hind femur (except basal third), hind tibia basally and apically and hind tarsus with first segment blackish. Pterostigma brown, basally and apically white.

Body length: 4.3 mm.

Male unknown.

**Etymology.** Named after Nanina Shaw-Reade, sister of the second author.

***Theroscopus ochrogaster*** (Thomson, 1888) (= *rotundator* Aubert, 1989 **syn. nov.**)

The interpretation of *Phygadeuon ochrogaster* Thomson is based on the lectotype designated by Frilli (1973). According to Fitton (1982), the lectotype designation is invalid because the specimen is not a syntype, but Horstmann (1984) gave reasons why the lectotype can be accepted, and here we follow Horstmann. We have studied the holotype of *Theroscopus rotundator* Aubert.

This species is here recorded as British for the first time. Numerous specimens. **England:** V.C.s 7, 9, 22, 23, 24, 27, 28, 29, 32, 33, 59. **Isle of Man:** V.C. 71. **Scotland:** V.C.s 97, 99, 101. **France:** Dordogne. Specimens collected from (?v)vi–viii(?ix).

***Theroscopus opacinotum*** (Hellén, 1967)

This species is here recorded as British for the first time. **England:** 3 ♀, Cambridgeshire, Chippenham Fen, TL6569 (V.C. 29), 16–24.vi.1983, 25.viii–5.ix.1983 and 4–13.ix.1983 (♀ *Field*). There is also 1 ♀ from P. Cameron's collection with illegible data, perhaps not British.

***Theroscopus pedestris*** (Fabricius, 1775)

**Germany:** 1 ♀, Baden-Württemberg, Murrhardt, 5.ix.1906.

***Theroscopus pedicellatus*** Horstmann, 1998

This species is here recorded as British for the first time. Several specimens. **England:** V.C.s 22, 27. **Scotland:** V.C.s 97, 99, 101. Specimens collected from (?v)vi–vii(?viii).

***Theroscopus pullator*** (Gravenhorst, 1829) (= *notaulius* (Morley, 1947))

Fitton *et al.* (1978) listed this species twice, as a doubtfully placed species of *Hemiteles* Gravenhorst and in *Stiboscopus* Foerster.

Several specimens. **England:** V.C.s 7, 22, 23, 60. **Scotland:** V.C.s 77, 99. Specimens collected in v, (?vi)vii(?viii) and viii/ix, and also beaten from trees in iv (1 ♀) and x (1 ♀) which may suggest hibernation as an adult.

***Theroscopus rufulus*** (Gmelin, 1790) (= *litoreus* (Parfitt, 1882))

This species was listed twice by Fitton *et al.* (1978), once as a doubtfully placed species of *Hemiteles* Gravenhorst.

Numerous specimens. **England:** V.C.s 25, 27, 36, 69. **Wales:** V.C. 52. **Scotland:** V.C.s 88, 89, 96, 105. Specimens collected from iv–x. Reared from cocoons of *Hypera adspersa* (Fabricius) (Coleoptera: Curculionidae) on *Peucedanum palustre*, coll. vii/viii, em. viii (*M. R. Shaw*) (2), and from cocoons of *Hypera connaculata* (Herbst) on *Apium nodiflorum* coll. vii/viii, em. vii/viii (*M. J. Leech*) (4). The overall data clearly suggest that it is plurivoltine, and that it may be a specialist parasitoid of curculionid cocoons.

***Theroscopus unguularis*** (Thomson, 1884)

This species was listed by Fitton *et al.* (1978) as a doubtfully placed species of *Hemiteles* Gravenhorst.

Several specimens. **England:** V.C.s 22, 23, 27. Specimens collected from vii–viii(?ix) and in ix/x, always in fens.

***Megacara hortulana*** (Gravenhorst, 1829) (= *rusticellae* (Bridgman, 1886))

This species was listed by Fitton *et al.* (1978) in *Phygadeuon* Gravenhorst.

Numerous specimens. **England:** V.C.s 15, 21, 22, 23, 24, 27, 29. **Wales:** V.C. 52. **Scotland:** V.C.s 82, 83, 86, 88, 89, 99. **France:** Dordogne, Lot-et-Garonne, Saône-et-Loire. Specimens collected in iii/iv, iv/v and from (?v)vi–x(?xi). Reared from puparia of *Fannia* sp. (Diptera: Fanniidae) coll. in pigeon's nest iii, em. iv (*K. P. Bland*) (11), and em. iv–v from birds' nests (8, 3 sites).

***Megacara vagans*** (Gravenhorst, 1829)

This species was listed by Fitton *et al.* (1978) in *Phygadeuon* Gravenhorst.

Many specimens. **England:** V.C.s 1, 36. **Wales:** V.C. 52. **Scotland:** V.C. 75, 86, 96. **Ireland:** V.C. H.3. **France:** Dordogne. Specimens collected from vi–viii.

***Phygadeuon*** Gravenhorst, 1829

Very few species in this large genus can be determined reliably in the absence of a recent revision, and over 1500 specimens in the collection remain unidentified. Among them will be specimens that might better be placed in *Theroscopus* and (especially in the male sex) probably other genera.

***Phygadeuon acutipennis*** Thomson, 1884

**England:** 1 ♀, Cambridgeshire, Chippenham Fen, TL6569 (V.C. 29), 11–22.viii.1985 (*J. Field*). **Scotland:** 4 ♀, Wester Ross, Sheildaig, NG8252 (V.C. 105), vii.1991 (2 ♀) and viii.1991 (2 ♀) (*I. MacGowan*). Also 1 ♀ from C. Morley's collection (*A. Piffard*) without data.

***Phygadeuon clotho*** Kriechbaumer, 1892 (= *grossae* Horstmann, 1981)

Horstmann (1981) included specimens from England and Scotland in his description of *P. grossae*, which he later (Horstmann, 2001) synonymised with *P. clotho*.

Many specimens. **England:** V.C. 11, 22. **Wales:** V.C. 35, 45, 46. **Scotland:** V.C. 77, 83, 103, 109. **Germany:** Bayern. Specimens collected from vii–ix. Reared from puparia of *Cheilosia* spp. (Diptera: Syrphidae) collected as larvae in *Cirsium palustre* stems as follows: *C. grossa* (Fallén) (*G. E. Rotheray*) (8); *C. albipila* Meigen (*I. R. Hudson*; *M. Romstöck*, Germany) (3); *Cheilosia* sp. (*B. Barr*) (6). Also from puparia of indet. *Cheilosia* spp. in stem of Apiaceae (*R. E. Evans*) (1) and unidentified 'stem' (*R. E. Evans*) (1). Plurivoltine: emergence has been in vii/viii from hosts collected in vi, or v/vi in the year following collection in viii/ix.

***Phygadeuon cylindraceus*** Ruthe, 1859 (= *subvoldensis* Morley, 1947)

Fitton *et al.* (1978) listed this species twice.

**England:** 1 ♀, Cumbria, Sandscale Haws, SD2075 (V.C. 69), 18.vi.1999 (*P. J. Chandler*). **Scotland:** 1 ♀, 3 ♂, West Lothian, Linlithgo Loch (V.C. 84), ex puparia of *Trichopalpus fraternus* (Meigen) (Diptera: Scathophagidae) in coot's nest, coll. 7.viii.1987, em. 3.ix.1987 (*J. M. Nelson*). The specimens were all determined by K. Horstmann, the reared series doubtfully.

***Phygadeuon elegans*** (Foerster, 1850)

Horstmann (1993*a*) recorded this species from England.

Several specimens. **England:** V.C. 29. **Wales:** V.C. 41, 45. **Scotland:** V.C. 77, 109. Specimens collected in v, vii and from ix–x. One was reared from the puparium of an unidentified species of cyclorrhaphous Diptera, coll. viii in soil, em. the following v.

***Phygadeuon forticornis*** Kriechbaumer, 1892

**England:** 3 ♀, Norfolk, Catfield, TG3720 (V.C. 27), 6–16.viii.1980 (*M. R. Shaw*); 1 ♀ Cambridgeshire, Chippenham Fen, TL6569 (V.C. 29), 11–22.viii.1985 (*J. Field*).

***Phygadeuon fraternae*** Horstmann, 2001

Horstmann (2001) included 5 ♀, 1 ♂ specimens from Scotland (in NMS) as paratypes in his description of this species.

**Scotland:** 4 ♀, 1 ♂ (paratypes) Dunbartonshire, Caldaran (V.C. 109), ex *Cheilosia fraternae* (Meigen) (Diptera: Syrphidae) puparia, coll. as larvae in *Cirsium palustre* stems/rosettes 22.viii.1985, em. vii.1986 (*G. E. Rotheray*); 1 ♀ (paratype), Midlothian, Pentland Hills, NT 1859 (V.C. 83), ex puparium of *C. fraternae*, coll. as larva in *Cirsium palustre* root 5.x.1985, em. 5.vii.1986 (*D. M. Robertson*). A further ♀ from the Caldaran locality, labelled by Horstmann as a 'var.' of this species and excluded from the type series, was reared from a puparium of *Cheilosia proxima* (Zetterstedt) collected as larva in *Cirsium palustre* rosette x.1984, em. vii.1985 (*G. E. Rotheray*). Subsequently another ♀, also labelled by Horstmann as a 'var.', was reared from a *C. fraternae* puparium (det. *G. E. Rotheray*), Lanarkshire, Barons Haugh (V.C. 77), coll. iv, em. v.1995 (*B. Barr*).

***Phygadeuon fumator*** Gravenhorst, 1829

**Scotland:** 1 ♀, Midlothian, Hermitage of Braid, NT2570 (V.C. 83), ex puparium of *Hydrophoria linogrisea* (Meigen) (Diptera: Anthomyiidae) under

the bark of a fallen *Fagus*, coll. 7.v.1995, em. 12.v.1995 (*G. E. Rotheray*). The specimen is only doubtfully determined (by K. Horstmann).

***Phygadeuon gracilentus*** Horstmann, 1997 (= *gracilicornis* Horstmann, 1993, preocc.)

Horstmann (1993*a*) designated an English specimen as holotype, and also cited a Scottish paratype, in his description of this species. One paratype (not British) belongs to *Phygadeuon palus* sp. nov.

Many specimens. **England:** V.C.s 7, 28, 29, 36, 58. **Scotland:** V.C. 88, 97. Specimens collected from (?v)vi–viii.

***Phygadeuon leucostigmus*** Gravenhorst, 1829

**England:** 2 ♀, Dorset, Worbarrow Bay, SY8680 (V.C. 9), 17–24.vii.2005 (♂. *Hunnisset*).

***Phygadeuon melanopygus*** (Gravenhorst, 1829) **comb. nov.**

This species was listed by Fitton *et al.* (1978) as a doubtfully placed species of *Hemiteles* Gravenhorst.

**England:** 2 ♀, Berkshire, Silwood Park, ex puparium of *Sphaerophoria scripta* (Linnaeus) (Diptera: Syrphidae), 7.viii.1957 (*T. J. White*) (1 ♀) and ex puparium of *Sphaerophoria* sp., 6.vi.1956 (1 ♀). **Isle of Man:** 1 ♀, The Curraghs, Goshan, SC3595 (V.C. 71), 23–30.vii.1995 (*S. M. Crellin*).

**Scotland:** 1 ♀ Inverness-shire, Abernethy Forest (V.C. 95), 26.v–2.vi.1988 (*D. Phillips*). **France:** 1 ♀, Côte d'Or, Val Suzon, 13–14.vii.2003 (*M. R. Shaw*).

***Phygadeuon palus* sp. nov.** (Figs 9, 42, 43)

Holotype (♀): [**Wales**] 'Magor Marsh, Gwent ST426868 (2) 28.9.88 NCC Welsh Peatland Survey. P. Holmes NMSZ 1996.023' [V.C. 35] (in National Museums of Scotland, Edinburgh).

Paratypes (28 ♀): **England:** 1 ♀, Oxfordshire, Wychwood Forest, SP3417 (V.C. 23), 4–23.v.1990 (*K. Porter*/NCC); 3 ♀, Norfolk, Strumpshaw, TG3307 (V.C. 27), 21.viii–15.ix.1989 (*A. P. Foster*/NCC); 1 ♀, Norfolk, Reedham, TG3619 (V.C. 27), 22.viii–5.ix.1989 (*A. P. Foster*/NCC); 1 ♀, Norfolk, Sea Mere, TG0300 (V.C. 27), 16.ix.1988 (*A. P. Foster*/NCC). **Wales:** 1 ♀, Anglesey, Cors Erddreiniog, SH4681 (V.C. 52), 14–27.7.1988 (*P. Holmes*/NCC); 4 ♀, Pembrokeshire, The Ritec, SM1001 (V.C. 45), 30.ix.1987 (*P. Holmes*/NCC); 1 ♀, Pembrokeshire, Portheliddy Moor, SM8031 (V.C. 45), 29.ix.1987 (*P. Holmes*/NCC); 7 ♀, Pembrokeshire, Cors Penally, SM1198 (V.C. 45), 22.vii.1987 (1 ♀), 30.ix.1987 (6 ♀, one in BMNH) (all *P. Holmes*/NCC); 1 ♀, Pembrokeshire, Dowrog Common, SM7827 (V.C. 45), 29.ix.1987 (*P. Holmes*/NCC); 1 ♀, Pembrokeshire, Western Cleddau, SM9131 (V.C. 45), 29.ix.1987 (*P. Holmes*/NCC); 1 ♀, Pembrokeshire, St. Davids Airfield, SM7826 (V.C. 45), 12.x.1987 (*P. Holmes*/NCC); 1 ♀, Pembrokeshire, Cwm Dewi, SN0139 (V.C. 45), 28.ix.1987 (*P. Holmes*/NCC) (apart from the indicated specimen in BMNH, all the foregoing in NMS). **Austria:** 1 ♀, Oberösterreich, Teichstätt NW Straßwalchen, 48°02'N, 13°12'E, 31.v.1992 (*M. Schwarz*) (in coll. Schwarz); 1 ♀, Oberösterreich, Aschenberg NE St. Roman, 48°29'N, 13°38'E, 1.ix.1999 (*M. Schwarz*) (in coll. Schwarz); 1 ♀, Oberösterreich, Langzwettl N Zwettl/Rodl, 48°29'N, 14°17'E, 27.vii.1982 (*M. Schwarz*) (paratype of *Phygadeuon gracilicornis* Horstmann, 1993, preocc. (= *Phygadeuon gracilentus* Horstmann 1997)) (in coll. Schwarz); 1 ♀, same data except 10.ix.1982 (in coll Schwarz); 1 ♀, same data except 22.vii.1985 (in coll. Schwarz); 1 ♀, Oberösterreich, Glashütten near Reichenau/Mühlkreis, 1.viii.1985 (*M. Schwarz*) (in coll. Schwarz). **Czech Republic:** 1 ♀, Trinec, Sosna, 9.v.1988 (*V. Barták*) (in Biologiezentrum, Linz, Austria). The specimens were collected in fens or other wetland habitats, mostly in pitfall traps.



The holotype is a macropterous specimen. This species is similar to *Ph. melanopygus* (Gravenhorst) but can easily be distinguished by its ovipositor tip (Fig. 9). *Phygadeuon palus* sp. nov. can also be confused with *Ph. gracilentus* Horstmann, from which it can be separated by its more extensively orange gaster and its longer malar space. In *Ph. gracilentus* Horstmann only the second segment and base of the third segment of the gaster can be orange.

Female. Brachypterous or macropterous; in brachypterous specimens fore wing 1.4–2.1 times and in macropterous specimens 2.3–2.5 times as long as hind tibia; the relative wing length is correlated with the body length, small specimens have the shortest wings and larger specimens are macropterous.

Antenna thick and widened to the apex; third segment 2.6–3.4 times and sixth segment 1.5–1.7 times as long as wide. Head lustrous and not granulate except for a stripe at malar space. Face with fine or moderate punctures, distances between punctures very variable. Clypeus distinctly separated from face and with scattered somewhat coarse punctures, lower margin depressed and with a pair of small teeth. Upper tooth of mandible somewhat longer than lower tooth. Malar space 1.2–1.5 times as long as basal width of mandible. Temple with very fine and scattered hairs. Frons and vertex with very fine and moderately spaced hairs. Head behind the eyes weakly narrowed and rounded (Fig. 42).

Thorax lustrous and without granulation. Mesoscutum and scutellum with very fine hairs. Notaulus short. Mesopleuron only above and sometimes also on front side with very fine punctures. Sternaulus deep anteriorly and with distinct transverse ridges. Metapleuron with very fine punctures and in some cases with some rugosity below.

Propodeum (Fig. 43) of moderate length and with all carinae. Propodeum dorsally lustrous and with a smooth background or partly indistinctly or weakly granulate, close to the carinae with rugosity. Area superomedia hexagonal and 0.6–1.4 times as long as wide. Costula a little or distinctly behind the middle of the area superomedia. Second pleural area of propodeum sometimes entirely rugose.

Macropterous specimens: fore wing with radial cell short. Radius behind areolet bent. Areolet open with second intercubitus absent. Second recurrent vein with two bullae or with one bulla. Second discoidal cell with posterodistal corner at nearly a right angle. Nervulus opposite or distad of basal vein. Nervellus in hind wing intercepted distinctly below the middle.

Hind femur 4.2–4.5 times as long as wide. Hind tibia without long erect hairs dorsally. Fifth tarsal segments not enlarged.

First segment of gaster (Fig. 43) with distinct median dorsal carinae, ending at about midlength of postpetiole. First segment of gaster dorsally elevated at base of postpetiole (as in *Ph. melanopygus* (Gravenhorst)). Postpetiole of moderate width, granulate and with longitudinal striae, apically smooth. Second tergite of gaster except hind margin finely granulate and lustrous, with scattered hairs (mainly subapically and laterally). Third tergite smooth and without granulation. Ovipositor sheath 0.6–0.7 times as long as hind tibia. Ovipositor moderately robust. Ovipositor tip 2.2–2.7 times as long as high, with distinct nodus dorsally and distinct teeth ventrally (Fig. 9).

Coloration: black. Base of antenna (basal 5 or 6 or rarely up to 8 segments), mandible except teeth, palpi, tegula, sometimes postpetiole medioapically, most of gaster beyond first segment and legs orange. Tergite 6 laterally or tergites 5–6 laterally and in dark specimens also tergite 6 dorsally and tergite 7 dark brown or

blackish. Sometimes base of middle tibia, often base of hind tibia and sometimes hind tibia apically brown. In some specimens thorax laterally with distinct reddish patches. Pterostigma of fore wing brown, basally and apically narrowly pale. Body length: 2.2–5.1 mm.

Male unknown.

**Etymology.** *Palus* is the Latin word for fen, referring to the habitat in which the species occurs.

***Phygadeuon paradoxus*** (Bridgman, 1889)

**England:** 1 ♀, Manchester, Fletcher Moss (V.C. 59), 4.v.1977 (*M. R. Shaw*).

***Phygadeuon rotundipennis*** Thomson, 1884

Many specimens. **England:** V.C. 59. **Wales:** V.C.s 44, 45, 46, 49, 52. **Isle of Man:** V.C. 71. **Scotland:** V.C.s 82, 86, 92, 97, 99, 109. Specimens collected from v–x. Reared from puparia of *Delina nigrita* (Fallén) (Diptera: Scathophagidae) mining *Dactylorhiza*, coll. as puparia viii, em. vi the following year (*K. P. Bland*) (2).

***Phygadeuon trichops*** Thomson, 1884

**Scotland:** 1 ♀, Fife, Loch Leven NNR (V.C. 85), ex puparium of *Lispe tentaculata* (De Geer) (Diptera: Muscidae), coll. viii.1994, em. 1994 (*I. MacGowan*). The specimen is only doubtfully identified (by K. Horstmann).

***Phygadeuon vexator*** (Thunberg, 1822)

**England:** 1 ♀, Yorkshire, Rotheram (V.C. 63), ex puparium of *Triarthria spinipennis* (Meigen) (Diptera: Tachinidae) coll. iii.1975, em. 24.iv.1975 (*T. H. Ford*); 1 ♂, Warwickshire, Newbold on Avon (V.C. 38), ex puparium of *T. spinipennis* coll. 5.iii.1977, em. 14.iv.1977 (*T. H. Ford*); 1 ♂, Berkshire, Great Shefford (V.C. 22), ex puparium of *T. spinipennis* coll. 10.iv.1977, em. 30.iv.1977 (*T. H. Ford*). Also 1 ♀, 1 ♂ labelled as reared from acorns harbouring *Andricus quercuscalicis* auctt. (?nec Burgsdorf) (Hymenoptera: Cynipidae) (*K. Schönrogge*), but these had been kept in large batches and the ♀ is mounted with a puparium of *T. spinipennis*: since this tachinid is a common and regular parasitoid of *Forficula auricularia* Linnaeus (Dermaptera) it is likely that first earwigs and subsequently *P. vexator* had invaded the galls or rearing cages.

***Ceratophygadeuon*** Viereck, 1924

Some males of this genus in NMS remain unidentified.

***Ceratophygadeuon gracilicornis*** Horstmann, 1979

This species is here recorded from Britain for the first time. **England:** 1 ♀, Norfolk, Catfield, TG3720 (V.C. 27), 7–18.vii.1984 (*R. T. J. Jarvis*).

***Ceratophygadeuon parvicaudator*** (Aubert, 1965)

This species is here tentatively recorded from Britain for the first time. Several specimens. **England:** V.C.s 22, 27. **Germany:** Baden-Württemberg,

Ingersheim. Specimens collected in vi/vii and (?viii)ix(?x). The English specimens are all from fens. The determination of all specimens recorded here is doubtful.

***Ceratophygadeuon varicornis*** (Thomson, 1885) (= *maritimus* Horstmann, 1979)

Horstmann (1993*c*) has already recorded this species from England on the basis of specimens in NMS.

**England:** 3 ♀, Cambridgeshire, Chippenham Fen NNR, TL6569 (V.C. 29), 25.vi–6.vii.1983 (1 ♀), 24.vii–3.viii.1983 (1 ♀) and 11–22.viii.1985 (1 ♀) (♂. *Field*); 1 ♀, Norfolk, Santon Downham, TL8188 (V.C. 28), 20.vii–1.viii.1984 (♂. *Field*).

***Cephalobaris eskelundi*** Kryger, 1915

*Cephalobaris* was placed by Townes (1970) in its own subtribe, but Horstmann (1992) synonymised *Cephalobaridina* with *Phygadeuontina*.

This species is here recorded from Britain for the first time. **England:** 1 ♀, 1 ♂, Norfolk, Cranberry Rough, TL9293 (V.C. 28), 12–26.ix.1988 (*A. P. Foster/NCC*).

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