

European *Phalacrotophora* (Diptera: Phoridae)

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Introduction

Hitherto six species of scuttle fly of the cosmopolitan genus *Phalacrotophora* Enderlein were known from Europe, of which only two were recorded from Britain and the Netherlands (Disney, 1991). The larvae of these two species, *P. berolinensis* Schmitz and *P. fasciata* (Fallén), are parasitoids of the pupae of Coccinellidae (ladybird beetles) (Disney, Majerus & Walpole, 1994). The larval habits of the other four European species have remained unknown. However, we can now report on one of these species from the Netherlands, *P. delageae* Disney, and that it also parasitizes ladybird pupae. Its hitherto unknown male very closely resembles that of *P. berolinensis*. We present these new data below, add the description of a further new species from the Netherlands, and provide a new key to the European *Phalacrotophora*.

Phalacrotophora beuki Disney sp. n.

(Figs 14, 15)

Female.

Head. Upper half of frons brown, but orange from level of antero-lateral bristles forwards. At level of anterior ocellus it is slightly broader than midline length, but narrows anteriorly (being slightly less than midline length at level of antero-lateral bristles). Antials much lower on frons than antero-lateral bristles and close to single pair of supra-antennals, which are scarcely differentiated from 2–3 adjacent hairs. Rest of hairs on frons restricted to upper half and numbering 20–22. Bristles of median row in an almost straight transverse row and approximately equally spaced, the pre-ocellars being about as far apart as antials. Third antennal segment brownish yellow, pear-shaped, and with arista situated well before tip. Two basal segments of arista yellow, third segment brown. Yellow palps with six short to medium-length dark bristles near to or on the lower margin in apical third. Labrum orange-brown, almost as long as third antennal segment, but greatest breadth distinctly more than breadth of latter. Labella relatively broad.

Thorax. Scutum yellowish orange. Each side with a fine humeral bristle, three notopleurals, an intra-alar, a post-alar, a pre-scutellar dorsocentral, and two acrostichal bristles (the inner one being further forward than the outer one). Scutellum coloured as scutum, but a little browner on sides, with an anterior pair of hairs (only as strong as those on top of scutum) and a posterior pair of bristles. Mesopleuron bare. Pleural regions orange except for brown patches on pteropleuron.

Abdomen. Tergites 1–3 yellowish orange, 3 with a pair of papillae (as in *P.*

berolinensis). Tergite 4 largely brown laterally, but yellowish orange along broad median band. The composite tergite 5+6 represented by a weakly defined, pale, brownish orange region with minute scattered hairs. Bordering each lateral margin of this tergite, a broad longitudinal band of dense hairs. Tergite 7 elongate, ill-defined, yellow, it and terminal segments of abdomen as in Fig. 15.

Legs. Pale dusky yellow. All metatarsi slender, that of hind leg as in Fig. 14. With 4-6 differentiated hairs below basal half of hind femur, of which 2-3 are more bristle-like. About a dozen differentiated antero-ventral hairs on outer half of hind femur.

Wing. 2.4-2.5 mm long. Costal index 0.43. Costal ratios 4.15 : 1.73 : 1. Costal cilia 0.10 mm long. No hair at base of vein 3. Two subequal bristles on axillary ridge clearly longer than costal cilia. All veins yellowish grey. Membrane yellowish grey.

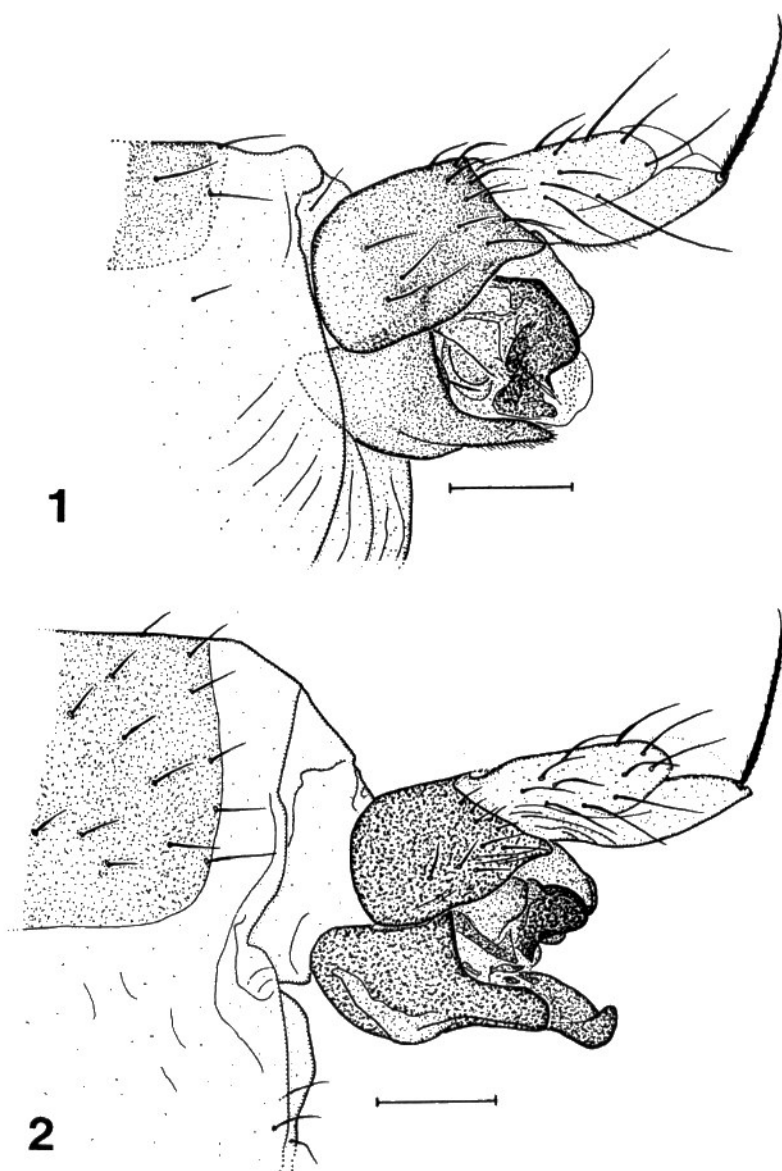
Haltere. Dusky yellow knob with a brown stem.

Holotype ♀, **Netherlands**: Gelderland, Rijswijk, Steenfabriek Roodvoet, amersf.-coör.: 153-441, on tree trunk, 19.vi.1993 (*P. L. Th. Beuk*) (Zoologisch Museum, Universiteit van Amsterdam).

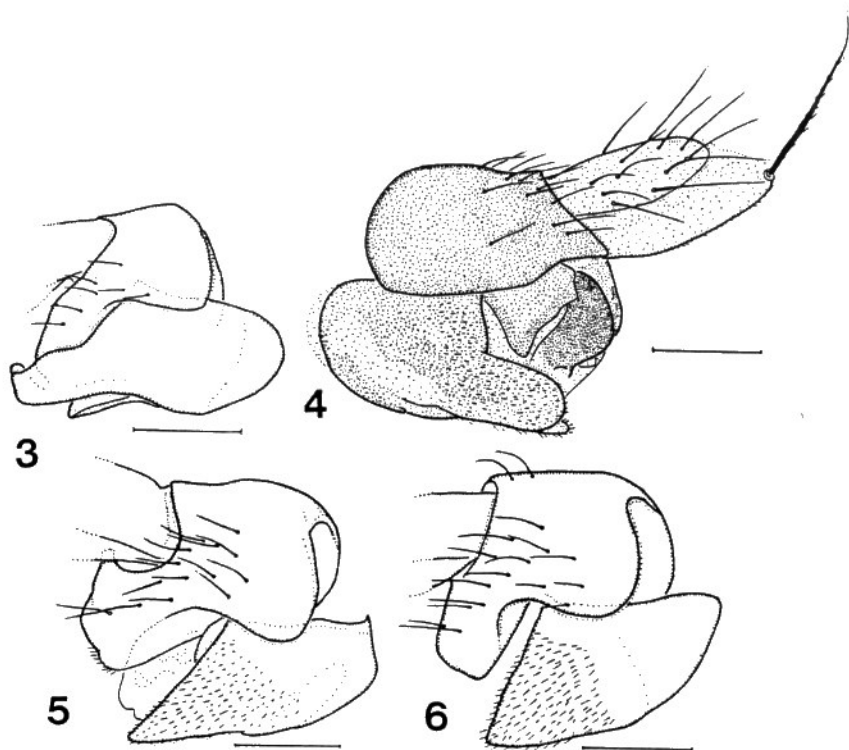
Affinities

This species is distinguished from the other European species in the key below. In the keys to Australasian, eastern Palaearctic and Oriental species (Borgmeier, 1967) this species runs out at couplets 16 or 18. It differs from *P. gigantea* Beyer by having the costa less than half the wing length instead of more than half. It differs from *P. quadrimaculata* Schmitz, which has been redescribed since the key (Disney & Chazeau, 1990), by having shorter hairs ventro-laterally on abdominal segment 8 and by the dense fields of hairs dorso-laterally on segments 5+6. In the keys to New World species (Borgmeier, 1971) the new species runs to couplet 6 or goes astray at couplet 15. It differs from *P. nedae* (Malloch) by the pale dusky yellow, not glossy black, hind metatarsus. In the key to Afrotropical species (Beyer, 1965) it runs to couplets 2 or 4. It differs from *P. triguttata* Beyer by lacking the oval patch on the wing between the bases of the first two thin veins. It differs from *P. braunsi* (Brues) in having a largely orange-yellow, not dark brown, thoracic scutum and in having the anterior scutellars reduced to short hairs.

The recognition of this new species, along with the first record of *P. delageae* from the Netherlands (see below), raised the possibility that *Phora nigrocincta* de Meijere (1907), which was described from the Netherlands, might not be a synonym of *P. fasciata* after all. The type-series of *P. nigrocincta*, comprising two males and 12 females, was reared from pupae of *Coccinella* collected at Meerssen (province of Limburg). Subsequently, de Meijere himself (1918) synonymized this species with *P. fasciata*. Twelve specimens of the hitherto scattered type-series of *P. nigrocincta* have now been located in the Zoological Museum, Amsterdam. They have been reassembled and properly labelled. A female with a well-extended abdominal segment 8 has been designated the lectotype (its original labels being: Meerssen / uit *Coccinella* / pop / VII.04 / Kempers; n. sp. *Phora* / det. Becker / *Aphiochaeta* / *fasciata* Fall. / det. de Meijere). This specimen, along with the rest of the series, is undoubtedly *P. fasciata*. We thus confirm the synonymy proposed by de Meijere.



Figs 1, 2. *Phalacrotophora* males, left faces of hypopygia. 1, *P. berolinensis*; 2, *P. fasciata*. (Scale bars = 0.1 mm.)



Figs 3-6. *Phalacrotophora* males, hypopygia. 3, *P. fasciata*, right faces of epandrium and hypandrium; 4, 5, *P. delageae* (4) left face of hypopygium; (5) right faces of epandrium and hypandrium; 6, *P. berolinensis*, right faces of epandrium and hypandrium. (Scale bars = 0.1 mm.)

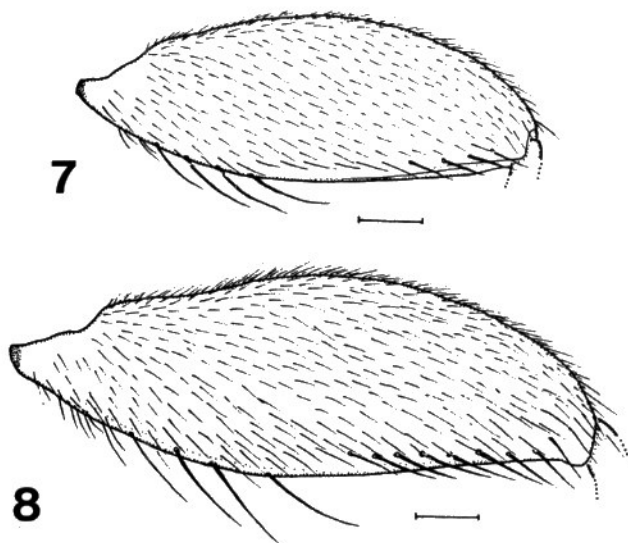
***Phalacrotophora delageae* Disney, 1979**

Phalacrotophora delageae Disney, 1979: 543. Holotype ♀, France: Montpellier (A. Delage) (Delage Collection, Montpellier) [examined].

[*Phalacrotophora fasciata* ♀ Delage & Lauraire, 1974: 497, fig. 2. Misidentification.]

This species was only known from the holotype until one of us (PLThB) reared three males and three females from three pupae of the ladybird *Adalia bipunctata* (Linnaeus), collected 30 June 1991 at Wageningen (Gld), Droeendaalsesteeg, Holland. The larvae emerged and pupated, and the adults subsequently emerged in July 1991. The three females were readily identified as *P. delageae*, but the males appeared to be *P. berolinensis*. However, detailed study has shown that they differ slightly from this species. It is concluded that they are the hitherto unknown males of *P. delageae*. It is clear, however, that if these males had not been associated in reared series with the females of *P. delageae*, they would have been misidentified as *P. berolinensis*.

The males of *P. delageae* tend to be a little larger than those of *P. berolinensis*, but they lie within the upper part of the range of variation for *P. berolinensis*. Counts of various setae indicate that those of some series are more numerous in *P. delageae* than in *P. berolinensis*, but the ranges for the two species overlap. Indeed it is not easy to separate the males of these two species, despite the females being easily distinguished. We distinguish the males in the new key to the European *Phalacrotophora* (see below), which replaces that of Delage & Lauraire (1974), and caution against records of *P. delageae* and *P. berolinensis* based upon isolated males only.

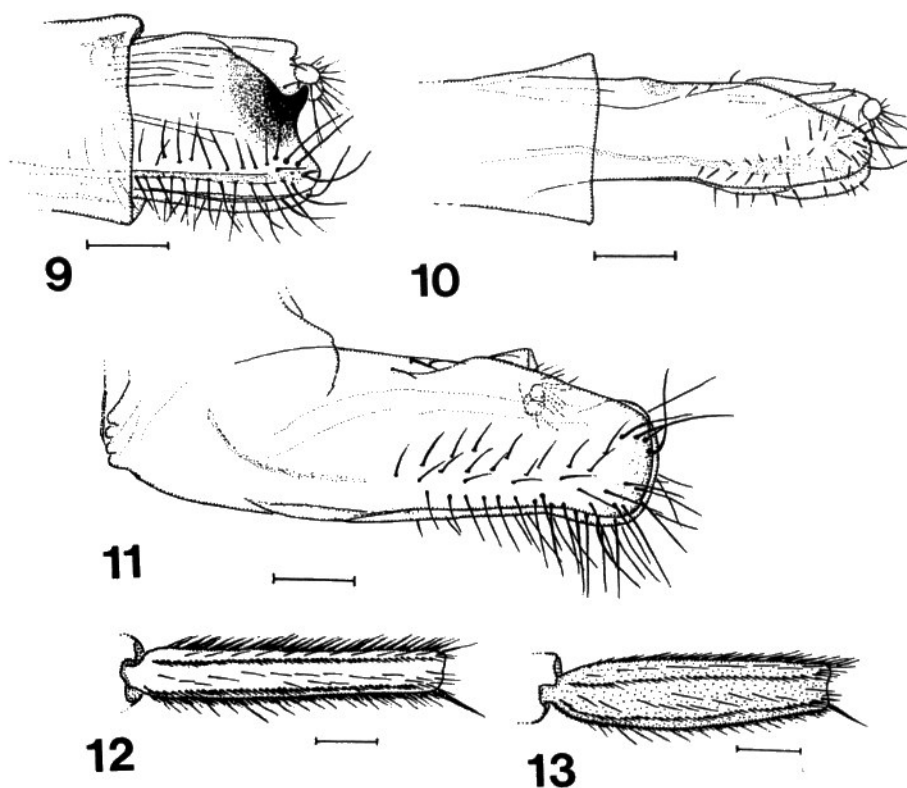


Figs 7, 8. *Phalacrotophora* males, anterior faces of hind femora. 7, *P. berolinensis*; 8, *P. delageae*. (Scale bars = 0.1 mm.)

Key to European *Phalacrotophora*

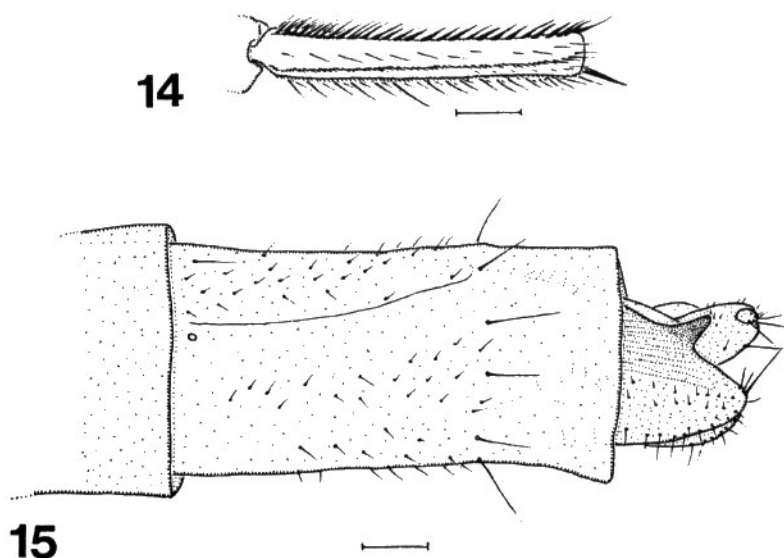
It is possible that *P. spectabilis*, only described from the female sex, is the unknown female of *P. pictofasciata*, only described from the male sex. Schmitz (1925) considered this to be impossible ('unmöglich'). However, the sexual dimorphism, which the hypothesis of conspecificity would thereby imply, is less than is the case with many other Phoridae (Disney, 1994). Reared series or pairs caught mating should resolve this problem.

- | | | |
|---|------------------------------|-------------------------|
| 1 | Mesopleuron bare | 2 |
| – | Mesopleuron with hairs | <i>paradoxa</i> Schmitz |
| 2 | Males | 3 |
| – | Females | 6 |



Figs 9–13. *Phalacrotophora* females. 9–11, left faces of abdominal segment 8 and beyond (9) *P. berlinensis*; (10) *P. fasciata*; (11) *P. delageae*. 12, 13, anterior faces of hind metatarsi (12) *P. delageae*; (13) *P. fasciata*. (Scale bars = 0.1 mm.)

- 3 Scutellum with four almost equal bristles *pictofasciata* Schmitz
- Scutellum with anterior pair of bristles clearly weaker and shorter than posterior pair, and frequently reduced to fine hairs 4
- 4 Right lobe of hind margin of hypandrium clearly longer than left lobe and as in Figs 2, 3 *fasciata* (Fallén)
- Right lobe of hypandrium subequal to left lobe and more triangular (Figs 5, 6) 5
- 5 Antero-ventral row of setae on outer half of hind femur more strongly differentiated (Fig. 8). With at least ten differentiated postero-dorsal, spine-like hairs on hind tibia. With 9–16 upper post-ocular bristles each side of head. Hypopygium as in Figs 4, 5 *delageae* Disney
- With more weakly differentiated row of antero-ventral setae on outer half of hind femur (Fig. 7). With 7–12, usually 10 or fewer, differentiated postero-dorsal hairs on hind tibia. With 7–12 upper post-ocular bristles each side. Hypopygium as in Figs 1, 6 *berolinensis* Schmitz



Figs 14, 15. *Phalacrotophora beuki* sp. n. female. 14, anterior face of hind metatarsus; 15, left face of terminal abdominal segments. (Scale bars = 0.1 mm.)

- 6 Scutellum with four almost equal bristles *spectabilis* Schmitz
- Scutellum with anterior pair of bristles clearly weaker and shorter than posterior pair, and frequently reduced to fine hairs 7
- 7 The postero-lateral borders of abdominal segment 8 with a dark, thorn-like projection each side (Figs 9, 15) 8
- No such projections on abdominal segment 8 (Figs 10, 11) 9
- 8 Abdominal tergites 1–4 brown. Abdominal segment 8 with relatively long hairs ventro-laterally (Fig. 9). Dorso-lateral regions of segments 5–6 with at most 30 minute hairs (all <0.03 mm long) bordering the ill-defined tergite *berolinensis* Schmitz
- Abdominal tergites 1–3 largely orange, contrasting with brown lateral thirds of tergite 4. Abdominal segment 8 with relatively short hairs ventro-laterally (Fig. 15). Dorso-lateral regions of segments 5+6 with at least 150 hairs, many being >0.03 mm long, each side of ill-defined tergite *beuki* Disney
- 9 Abdominal segment 8 with long hairs ventro-laterally (Fig. 11). Hind metatarsus dusky pale yellow, not swollen (Fig. 12) *delageae* Disney
- Abdominal segment 8 with short hairs ventro-laterally (Fig. 10). Hind metatarsus typically dark brown, somewhat swollen (Fig. 13) *fasciata* (Fallén)

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References

- Beyer, E. M. 1965. Phoridae (Diptera Brachycera). *Explor. Parc. natn. Albert Miss G. F. de Witte (1933-1935)* 99: 1-211.
- Borgmeier, T. 1967. Studies on Indo-Australian phorid flies, based mainly on material in the Museum of Comparative Zoology and the United States National Museum. Part II (Diptera, Phoridae). *Studia Ent.* 10: 81-276.
- 1971. Further studies on phorid flies, mainly of the Neotropical Region (Diptera, Phoridae). *Studia ent.* 14: 1-176.
- Delage, A. & Lauraire, M.-Cl. 1974. Mise au point sur le genre *Phalacrotophora* (Dipt. Phoridae) et description de l'ovipositor d'une femelle parasite. *Annls Parasit. hum. comp.* 49: 495-500.
- Disney, R. H. L. 1979. A new species of *Phalacrotophora* (Dipt. Phoridae) from France. *Annls Parasit. hum. comp.* 54: 533-536.
- 1991. Family Phoridae. In Soós, A. & Papp, L. (Eds), *Catalogue of Palaearctic Diptera* 7: 143-204. Budapest.
- 1994. *Scuttle Flies: The Phoridae*. London.
- Disney, R. H. L. & Chazeau, J. 1990. The recognition and biology of *Phalacrotophora quadripunctata* (Diptera: Phoridae) parasitising *Olla v-nigrum* (Coleoptera: Coccinellidae) used in attempts to control the *Leucaena* psyllid. *Annls Parasit. hum. comp.* 65: 98-100.
- Disney, R. H. L., Majerus, M. E. N. & Walpole, M. J. 1994. Phoridae (Diptera) parasitising Coccinellidae (Coleoptera). *Entomologist* 113: 28-42.
- Meijere, J. C. H. de 1907. Eerste supplement op de Nieuwe Naamlijst van Nederlandsche Diptera. *Tijdschr. Ent.* 50: 151-195.
- 1918. Tweede supplement op de Nieuwe Naamlijst van Nederlandsche Diptera. *Tijdschr. Ent.* 58: 293-320.
- Schmitz, H. 1925. Drei neue europäische Phoriden des ungarischen National-Museums. *Annls Mus. natn. hung.* 22: 119-123.