

# Four new species of *Pteromalus* Swederus (Hymenoptera: Chalcidoidea: Pteromalidae) and redescriptions of three other species

M.J. Gijswijt

Gijswijt, M.J. Four new species of *Pteromalus* Swederus (Hymenoptera: Chalcidoidea: Pteromalidae) and redescriptions of three other species.

Zool. Med. Leiden 72 (7), 30.iv.1999: 165-175, figs 1-9.— ISSN 0024-0672.

M.J. Gijswijt, Wessel ten Damstraat 2, 1244 RA Ankeveen, The Netherlands.

Key words: Chalcidoidea; Pteromalidae; *Pteromalus*; new species; redescriptions; Spain; Portugal; France; Greece; *Euphorbia*.

A key to the European species of the *Pteromalus altus* group is presented. The relationship between this group and species of the genus *Euphorbia* (Euphorbiaceae) is confirmed. One new species: *P. villosae*, associated with *Euphorbia villosa* Waldst. & Kit. is presented. Two new species of the *albipennis* group: *Pteromalus almeriensis* and *P. costulata* are presented. In addition one species of the *P. vibulenus* group: *P. tethys* is added. Information on *P. sylveni* Hedqvist, *P. osmiaae* Hedqvist and *P. discors* Graham is given.

## Introduction

Graham (1969), in his revision of the Pteromalidae of Western Europe, arranged the species of the genus *Habrocytus* Thomson, 1878 (now a subgenus of *Pteromalus* Swederus, 1795) in several species-groups. One of them was called the *altus*-group (pp. 537-538). More recently, he added several new species to this group and he observed that at least some of them were associated with fruits of *Euphorbia* species (Graham, 1984).

He also noticed that species of the *Eurytoma fuscipennis* group (Chalcidoidea: Eurytomidae) live on *Euphorbia* as well. Species of both genera are on the plants at the time when the fruits are ripening, however, the precise host relationships are still uncertain. Often, two species, one of the genus *Eurytoma* Illiger, 1807 and one of the genus *Pteromalus* frequent a specific *Euphorbia* host at the same time. Whether *Pteromalus* parasitises *Eurytoma* has not been confirmed. I never found remains of a second larva in fruits, that contained a nearly full grown larva. This could indicate that both are at least partly phytophagous.

No key to the species of the *Pteromalus altus* group was given by Graham (1984); to facilitate identifications, I add keys to males and females of this group.

Dr K.-J. Hedqvist (Vallentuna, Sweden) kindly loaned me holotypes and paratypes of the species *Pteromalus sylveni* and *P. osmiaae*, which he described in 1979. The descriptions are short and therefore, the species are difficult to identify. I recognised both as valid species and my redescriptions given here may help to identify them.

Dr J. Noyes (Natural History Museum, London) sent me the holotype of *Pteromalus discors* Graham, 1992, on loan. Some remarks in the description may confuse students. A short redescription, given in this paper, will hopefully overcome these problems.

**Morphological terms and abbreviations**

The terminology used is as in Graham (1969) except for the following (fig. 1):

Lower face: used for area below antennal toruli, and bounded laterally by the orbits and malar sulci (more or less "frons" in Graham).

Upper face: area between lower edge of antennal toruli and median ocellus, defined laterally by the inner orbits (more or less "face" in Graham).

Mouth: = "oral fossa" in Graham

M = marginal vein

PM = postmarginal vein

ST = stigmal vein

OD = longest diameter of lateral ocellus

F1, F2 etc.= funicle segments. NB: the anelli are not counted as funicle segments.

The surface to be measured must be at right angles to the line of sight.

In measuring breadth and length of head in dorsal view it is essential to orientate the head in such a position that the occipital surface just disappears and the observer is looking down vertically on the ocellar triangle.

**Depositories**

MJG M.J. Gijswijt, Ankeveen

RMNH Nationaal Natuurhistorisch Museum/Naturalis, Leiden

ZMA Zoologisch Museum Amsterdam, afd. Entomologie, all in The Netherlands.

**The *Pteromalus altus* group**

Definition.— Clypeus truncate or at most slightly emarginate, without a median fovea, flat. Pronotal collar rounded. Propodeum shorter than half scutellum with panels of median area uniformly reticulate; nucha with transversely orientated lengthened areoles and separated from median area by an obvious fossa; plicae at most slightly converging. Gaster longer than broad but not longer than combined length of head and mesosoma.

**Key to the females of the *Pteromalus altus* group**

- 1 Length of body 1.6-1.7 mm. Malar space 0.30-0.33 times length of eyes ..... *P. larzacensis* Graham  
 Note: associated with *Euphorbia* (?) *sequierana* Necker according to Graham (1984)
- Larger species with relatively longer malar space ..... 2
- 2 Length of body at least 3.0 mm, setae on wing surface brown ..... 3
- Either length of body less than 3 mm, or pilosity of wings pale ..... 4
- 3 Head and mesosoma dark blue with bronzy reflections. Basal cell near basal vein usually with 2 rows of setae; sometimes basal cell partly pilose; underside of costal cell with two complete rows of setae, the second one may be interrupted, apical third more densely setose. Scape not reaching median ocellus: length of scape 0.9 length of upper face. Wings infumate ..... *P. fuscipennis* (Walker)

Note: associated with *Euphorbia amygdaloides* L. and possibly with other species

- Body vivid green. Basal cell bare; underside of costal cell with second row of setae most often existing only in apical half of cell. Scape reaching at least middle of frontal ocellus, as long as upper face. Wings not infumate .... *P. villosae* spec. nov.  
Note: associated with *Euphorbia villosa* Waldst. & K.
- 4 Length of body 3.0-3.7 mm. Pilosity of wings pale and inconspicuous. Gaster 2.00-2.55 times as long as broad. [Malar space about 0.4 length of eye] .....  
..... *P. serratae* Graham  
Note: associated with *Euphorbia serrata* L.
- Length of body less than 3 mm; pilosity of wings pigmented; gaster relatively shorter ..... 5
- 5 Malar space 0.55 length of eye; funicle slender: F1 nearly twice as long as broad and hardly stouter than pedicellus, F4 quadrate ..... *P. moravicus* Graham  
Note: associated with *Euphorbia spinosa* Linnaeus, and others.
- Malar space less than 0.50 length of eye; funicle stout and more or less clavate, F1 at most quadrate, F2-F6 transverse; scapus reaching to middle of median ocellus; body colour bright green ..... *P. altus* Walker  
Note: associated with several species: *Euphorbia amygdaloides* L., *E. esula* L., *E. matritensis* Bois. and possibly other species.

### Key to males of the *Pteromalus altus* group

(the male of *P. villosae* is not known)

- 1 All funicle segments longer than broad ..... *P. moravicus* Graham
- At most F1 longer than broad ..... 2
- 2 Basal cell setose for at least proximal two-third ..... *P. fuscipennis* (Walker)
- Basal cell with at most three setae ..... 3
- 3 M 1.1-1.2 times ST ..... *P. larzacensis* Graham
- M at least 1.3 times ST ..... 4
- 4 Length of body less than 2 mm, tibiae infuscate ..... *P. altus* Walker
- Length of body more than 2 mm, tibiae testaceous ..... *P. serratae* Graham  
Note: the unknown male of *P. villosae* spec. nov. may key out here).

### Descriptions of species

*Pteromalus almeriensis* spec. nov.

(figs 2-6)

Type material.— Holotype: ♀ (RMNH), "ESPANA, prov. Almería, Mojácar, M.J. Gijswijt" "/Tryp. galls on *Artemisia*, 16-28 iv 1990". Paratypes (MJG, RMNH, ZMA): 1 ♀, "ESPANA, Murcia, M.J. Gijswijt" "Aledo, 29.iv.1986, *Artemisia*"; 1 ♀, same data without "*Artemisia*"; 1 ♀, "ESPANA, Almería, M.J. Gijswijt" "Darrical, langs Al 461, 16.v.1986"; 5 ♂♂, 2 ♀♀, "ESPANA, prov. Almería, M.J. Gijswijt" "MOJACAR, 12.iv.1990"; 2 ♂♂, 2 ♀♀, same data but 13.iv.1990; 13 ♂♂, 4 ♀♀, same data but 14.iv.1990; 2 ♂♂, same data but 17.iv.1990; 1 ♂, 1 ♀ same data but 18.iv.1990; 1 ♀, same data but 23.iv.1990; 3 ♂♂, 2 ♀♀, "ESPANA, prov. Almería, Mojácar, M.J. Gijswijt" "/Tryp. gall on, *Artemisia*, 6-10.v.1990" ; 5 ♂♂, 1 ♀, same data but 16-28.iv.1990; 2 ♂♂, 2 ♀♀, same data but 16-28.iv.1990 and "free pupa in gall"; 1 ♂, same data "ectopar. on larva in gall"; 1 ♂, "ESPANA, prov. Almería, M.J.

Gijswijt" "CARBONERAS, 21.iv.1994"; 1 ♂, same data but 22.iv.1994; 1 ♂, same data but 22.iv.1990; 3 ♂♂, "ESPANA, prov. Almería, M.J. Gijswijt", "TURRE, 15.iv.1990"; 1 ♂, "ESPANA, prov. Almería, M.J. Gijswijt", "CARBONERAS, Sra Cabrera, 6.iv.1995"; 1 ♀, "ESPANA-Alm., MOJACAR, /galls *Pteulidaspidis*, tavar. 27.iv.1996, M.J. Gijswijt"; 1 ♂, same data but 9.v.1996; 2 ♂♂, 1 ♀, same data but 20.iv.1996 and with "ectopar. op larve".

Description of female.— Morphology: head in dorsal view 2.4-2.5 times as broad as long, temples 1/3 length of eye, POL 1.2-1.4 OOL, OOL 2.3-2.4 OD; in frontal view the head is 1.3-1.4 times broader than high, malar space 0.5-0.6 times length of eye, mouth twice as long as malar space, eye 1.4-1.5 times longer than broad; lower edge of toruli situated in middle of face: length of lower face 0.95 times upper face.

Antennae (fig. 2) with scapus as long as upper face and 0.8-0.9 times length of eye, pedicellus plus flagellum about as long as breadth of head, slightly tapering distally, F1 twice as long as broad, following segments slightly shorter, sensilla small, in three to four irregular rows on F2-F4 and in two rows on F5 and F6.

Mesosoma 1.4 times as long as broad, 0.8 times as broad as head; pronotum 0.18-0.20 times as long as mesoscutum, pronotal collar rounded, posterior margin at least laterally smooth; scutellum about as long as broad; propodeum (fig. 3) with median area 2.1-2.3 times as broad as long and about 0.4 times as long as scutellum, lateral plicae very sharp and strongly converging till posterior margin of nucha; panels of median area rather regularly reticulate, pilosity of callus extending till plicae. Forewing (fig. 4): costal cell:M:St:PM=100:37:33:48; stigma moderately large, its distance to wing margin slightly more than twice its height; costal cell with complete hairrow on lower surface, distally with some additional setae, basal vein with 5-8 setae, speculum on upper surface interrupted by about 10 scattered setae below distal half of M. Hind femur 4.3-4.5 times as long as broad.

Gaster 3.1-3.7 times as long as broad, 1.9-2.1 times as long as mesosoma; last tergite 2.2-2.5 as long as basally broad.

Length: 3.9-6.2 mm, most specimens 5-6 mm.

Colour: head and mesosoma dark bluish-green, sometimes with golden reflections; gaster dark blue-green with a violet band across on apical part of each tergite. Flagellum black; coxae and femora except tips concolorous with mesosoma; tips of femora, tibiae and tarsi yellow or testaceous, middle- and hind tibiae infuscate in the middle, last tarsal segments black; wing veins and tegulae brown.

Description of male.— Morphological differences: head in dorsal view 2.2-2.4 times as broad as long, OOL 1.6-1.8 OD; antenna (fig. 5): pedicellus + flagellum 1.1-1.2 times breadth of head; sensilla on funicle segments less numerous.

Mesosoma 1.5-1.6 times as long as broad, pronotum 0.15 times as long as mesonotum, scutellum 1.0-1.3 times longer than broad, propodeum (fig. 6) with medium area 1.4-1.6 times broader than long with a transversely aciculate nucha that occupies about 1/3 of the sclerite, plicae sharp till hind margin and nearly parallel along nucha. Hind femur 4 times as long as broad.

Length: 2.7-3.2 mm.

Colour as in female, but gaster often with a transparent spot proximally. Especially in smaller specimens only the ventral plica is light. Occasionally the whole gaster is dark.

Biology.— Ectoparasite of larvae of *Ptoelidaspidis tavaresiana* Bezzi, 1920 (Diptera,

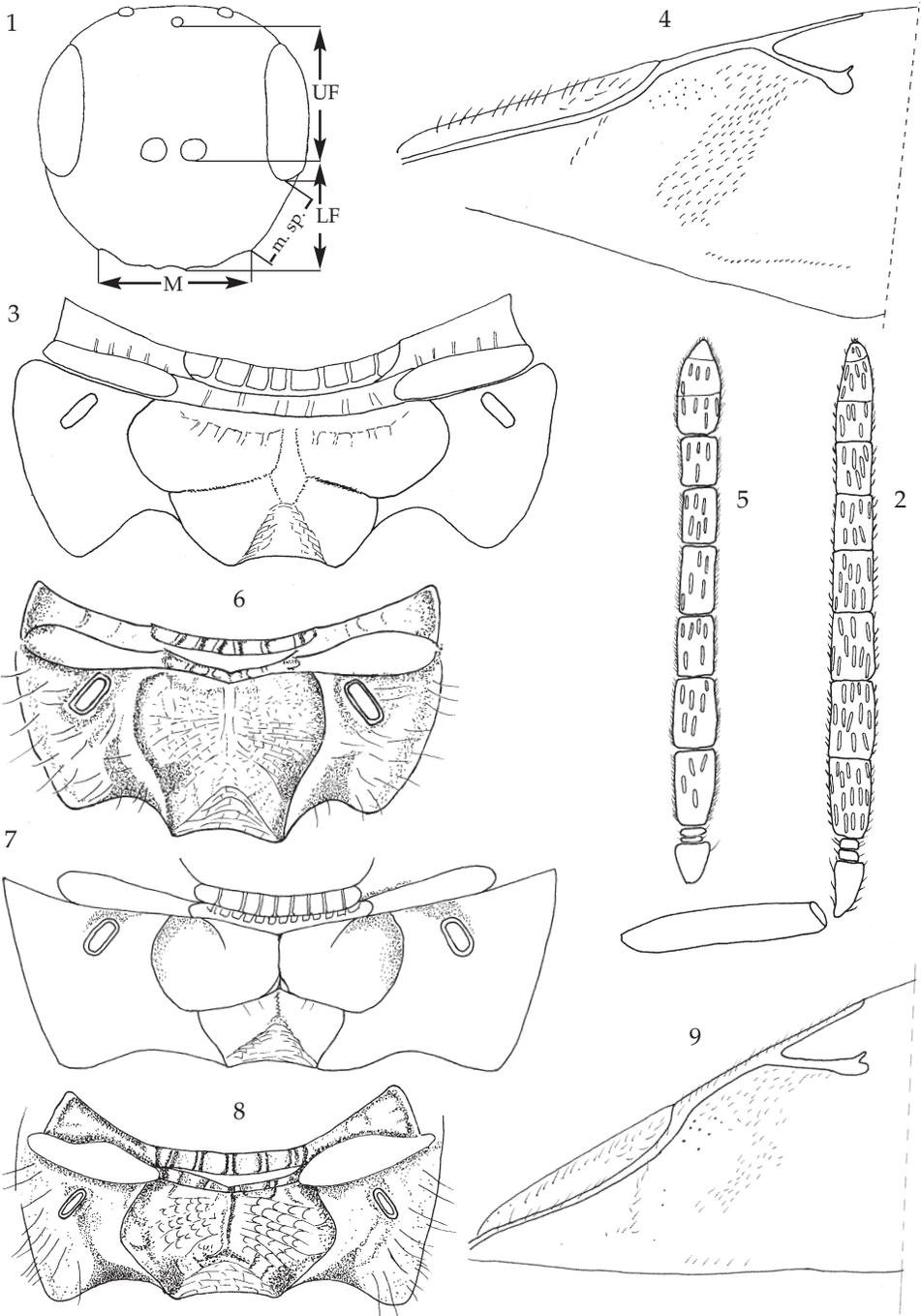


Fig. 1, morphology head: UF = upper face, LF = lower face, M = mouth, m. sp. = malar space; figs. 2-6, *P. almeriensis* spec. nov.; fig. 7, *P. costulata*: spec. nov.; figs. 8-9, *P. tethys* Hedqvist. 2, antenna of ♀; 3, 7, 8, propodeum of ♀; 4, 9, fore wing of ♀; 5, flagellum of ♂; 6, propodeum of ♂.

Tephritidae) in galls on *Artemisiae herba-alba* Asso.

Distribution.— Spain, mainly known from the province of Almería.

Discussion.— *P. almeriensis* belongs to a cluster of species in the *albipennis* group including *P. musaeus* Walker, 1844 and *P. myopitae* (Graham, 1969) characterised by a complete row of setae on the underside of the costal cell and by toruli situated in the middle of the face. The females can be separated from the other species by the elongate funicle segments which bear numerous and small sensilla, and by the funicle, which is slightly tapering distad. Both females and males have the median panels of propodeum more regularly reticulate. Males most often have a pale mark on the gaster basally.

*Pteromalus costulata* spec. nov.

(fig. 7)

Type material.— Holotype ♀ (RMNH), "ESPANA, prov. Almería, GERGAL, M.J. Gijswijt" "/Tryp. gall on, *Helichrysum, serotinum*, 16-26.v.1990". Paratypes (MJC, RMNH, ZMA): 5 ♀♀, same data as holotype; 3 ♀♀ "ESPAÑA, prov. Málaga, M.J. Gijswijt" "EL CHORRO, 25 km SW ANTEQUERRA, on *Senecio linifolia*, 16.v.1994"; 1 ♀, "ESPAÑA, prov. Málaga, M.J. Gijswijt", "Casares, 8-10.vi.1986"; 1 ♀, "ESPAÑA-Mál., VÉLEZ MÁLAGA, 7.v.1994"; 1 ♀, "ESPAÑA-Mál., RONDA, 29.v.1994, M.J. Gijswijt"; 1 ♀, "ESPANA, prov. Almería, M.J. Gijswijt", "MOJACAR, 12.iv.1990"; 2 ♀♀, same data but 13.iv.1990; 1 ♀, same data but 14.iv.1990; 2 ♀♀, "ESPANA, prov. Almería, M.J. Gijswijt", "SAN JOSÉ, 25.iv.1990"; 1 ♀, "ESPANA, prov. Almería, M.J. Gijswijt", "CARBONERAS, 22.iv.1990"; 1 ♀, "ESPANA, prov. Granada, M.J. Gijswijt" "TORROX, 4.v.1990"; 1 ♀, "ESPANA, prov. Granada, M.J. Gijswijt", "GRANADA, Sa Nevada 1200 m, 8.v.1990"; 1 ♀, "ESPANA Valencia, MORAIRA, 16-30.v.1981, B. van Aartsen"; 1 ♀, ESPANA, Cuenca, M.J. Gijswijt" "Contreras, along rio Cabriel, 22-26.v.1987"; 1 ♀, "ESPANA, prov. Soria, M.J. Gijswijt", "15 km S EL, BURGO DE OSMÁ, 3.vii.1990, on *Card. crispus*"; 2 ♀♀, "PORTUGAL, A. Alentego, M.J. Gijswijt", "PORTALEGRE 700 m, Sa. de Mamede, 22.v.1990"; 2 ♀♀, "FRANCE, Drôme, M.J. Gijswijt", "SÉDERON, Col de l'homme mort, 15.viii.1988"; 1 ♀, "ELLAS Pelopon., prov. Argolida, M.J. Gijswijt" "MIKINES, 21.iv.1989"; 1 ♀, "ELLAS Ipiros, prov. Joanina, M.J. Gijswijt", "PAPINGO 40 km, NNW Joanina, 800 m meadow, 19.vi.1989"; 1 ♀, "ELLAS, Kriti, M.J. Gijswijt", "Anogia, 25.iv.1978".

Description of female.— Morphology: in dorsal view the head is 1.9-2.2 times as broad as long and 1.1-1.2 times broader than mesoscutum; POL 1.2-1.4 times OOL, OOL 2.1-2.5 times OD; temples 0.2-0.3 length of eye. In frontal view the mouth is 2.2-2.7 times broader than length of malar space, the latter half as long as an eye; lower face 0.8 times shorter than upper face, scape 4.9-5.8 times as long as broad, its length 0.8 times length of upper face and just reaching median ocellus. Pedicellus plus flagellum 0.8-0.9 times as long as breadth of head; pedicellus 1.3-1.45 times longer than broad, F1 1.2-1.3 times longer than broad, longer and broader than pedicellus, F2 quadrate or nearly so, F6 transverse.

Mesosoma 1.4-1.5 times broader than long; length of pronotum 0.2 times length of mesoscutum, front margin not carinate; scutellum 1.1 times longer than broad; median area of propodeum (fig. 7) 1.7-2.1 times broader than long, with a strong costula and only some diverging keels on the further shiny area, nucha nearly half as long as propodeum; hind femur 3.7-3.9 times longer than broad. Forewing 2-2.2 times longer than broad, hairrow on underside of costal cell interrupted, rarely complete, basal cell and basal vein bare, costal cell:M:PM:ST=100:44:48:36.

Gaster 1.9-2.3 times longer than broad, last tergite about as long as broad at base.

Colour: dark with coppery reflections, antennae dark with scape testaceous at base, rarely wholly dark testaceous. Coxae and femora dark green, tibiae brown, testaceous apically, first two or three tarsal segments testaceous, last segments brown. Wings hyaline, veins testaceous, stigma brown.

Length: 2.8-3 mm.

Male.— Unknown.

Distribution.— France, Spain, Portugal.

Biology.— Reared from tephritid galls on *Helichrysum serotinum* Borss.

Comments.— This species looks like *P. intermedius* (Walker, 1834), but it has a shorter pronotum, that is not sharply marginate, a shorter gaster, that rarely is longer than twice its breadth and a sharp costula on the propodeum.

*Pteromalus discors* Graham, 1990

*Pteromalus discors* Graham, 1990: 117, ♀.

The collection of the Nationaal Natuurhistorisch Museum in Leiden included a female of this species in the Heylaerts collection of Lepidoptera. It was reared from *Oreopsyche vesubiellae* (Millière) (Lepidoptera, Psychidae), collected in France, Alpes Maritimes, St Martin Lantosque on 24.v.1880, "Larva in corpore 1 (imagineis)". Graham noticed this specimen among a series of *Elasmus vesubiellae* (Millière, 1878), but he did not include this specimen in his description. Dr J. Noyes, London kindly loaned me the holotype and a comparison of the description and the two specimens in question showed a discrepancy for several characters which may hamper species recognition. Therefore I here give a redescription of the female.

In dorsal view the head is 2.25-2.3 times as broad as long and 1.2-1.25 times broader than mesoscutum; POL 1.3 OOL in holotype but 0.94 in the Heylaert specimen. OOL 2.4-2.6 times OD. The temples are 0.5 times apparent length of eyes. In frontal view the clypeus is slightly emarginate and not truncate. Mouth 1.8 times malar space, the latter 0.6-0.7 length of eye. The lower edge of the toruli is placed in the middle of the face and not in the lower position as originally described: the lengths of the lower face are 0.9 and 1.0 length of upper face in the holotype and the other specimen respectively; the scape is as long as the upper face and 0.9 length of eye; pedicellus plus flagellum 1.3 times breadth of head; pedicellus 1.3-1.4 times as long as broad; F1 1.6-1.9 times as long as broad, the following segments relatively shorter but still longer than broad: F6 1.2-1.5 times longer than broad.

Mesosoma 1.6 times as broad as long; pronotum 0.15-0.2 length of mesoscutum; scutellum 1.15-1.3 times as long as broad; median area 1.5-1.6 times broader than long; length of costal cell: M:PM:ST=100:46:55:35; basal cell bare, basal vein with 2-3 setae.

The gaster of the holotype is 1.8 times longer than broad and 1.4 times longer the mesosoma. The gaster of the other specimen is strongly telescoped. The last tarsal tergite is 0.7 times longer than broad.

The colour is as described by Graham: head and thorax dark blue-green, gaster green with golden reflections in places. Antennae fuscous; sensilla pale and conspicu-

ous. Coxae and femora coloured like the body; trochanters and tibiae mainly fuscous; knees, stripe on fore tibia, tips of mid and hind tibiae testaceous; tarsi testaceous, darkening to fuscous at tips. Wings hyaline, venation brownish-testaceous. Length: 2.5-2.6 mm.

Distribution.— France.

Biology.— Reared from (possibly an adult of) *Oreopsyche vesubiellae* (Millière) (Lepidoptera, Psychidae).

Comments.— The species is like *P. almeriensis* spec. nov. by having the flagellum stout proximally and slightly tapering distad, while the sensilla are very numerous and placed in three to four irregular rows on F1 and in three on F2. *P. almeriensis* differs from *discors* by its longer gaster (3 times as long as broad, and twice as long as mesosoma) and a longer last gastral segment.

*Pteromalus osmia* Hedqvist, 1979

*Pteromalus osmia* Hedqvist, 1979: 156-157, ♂ ♀.

The holotype (female) much resembles *P. vopiscus* (Walker, 1839). The differences are: POL 0.9 times shorter than OOL. Funicle segments 2-6 quadrate to transverse. Pronotal collar rounded. Median carina of propodeum sharp and complete. Forewing hyaline. The gaster of *P. osmia* is more slender with the last tergite about 1.1 times longer than broad instead of at most as long as broad in *P. vopiscus*.

The male (one paratype) differs from the female in colour: it is more greenish, the antennae are testaceous, with the flagellum darkened dorsally. Except for the coxae, the legs are wholly testaceous. The clypeus is reticulate in the middle part. This is invisible in the holotype, but that may not differ much. The clypeus of female *P. vopiscus* is wholly striate.

*Pteromalus sylveni* Hedqvist, 1979

*Pteromalus sylveni* Hedqvist, 1979: 155-156, ♂ ♀.

Redescription of holotype (female).— Morphology: in dorsal view the head is 2.15 times broader than long; POL 1.5 times OOL and OOL is 1.9 OD; gena one third eye length and the head is 1.25 times broader than mesoscutum. In frontal view mouth is 2.7 times larger than length of malar space, the latter 0.4 length of eye; lower face is as long as upper face. Antenna with scape as long as upper face and 0.9 length of eye; pedicellus plus flagellum about as long as breadth of head; pedicellus 1.4 times longer than broad and very slightly shorter than F1, F1 and F2 1.6-1.7 times longer than broad, F6 quadrate.

Mesosoma 1.7 times longer than broad; pronotum 0.15 length of mesoscutum; scutellum as long as broad; median area of propodeum 1.6 times broader than long. Forewing 2.2 times longer than broad, ratios costal cell:M:PM:ST=100:56:51:34.

Gaster 2.4 times longer than broad and 1.45 length of mesosoma, last tergite 0.8 times shorter than long.

Length: 2.97 mm.

Colour: head and mesosoma blue-green; gaster blue-green with a broad violet band on each tergite. Scape testaceous, flagellum light brown; coxae concolorous with body, femora green, tibiae infuscate, hind tibiae more strongly so.

Male (paratype).— Differs from female in having a pale spot on basal part of gaster and testaceous femora.

Comments.— *Pteromalus sylvenii* resembles *P. varians* (Spinola, 1808) (= *P. grandis* Walker, 1835), the only difference being the colour of the female femora (dark in *P. sylvenii*, yellow in *P. varians*). Moreover there is a striking difference in hosts: *P. varians* is a parasite of *Anthonomus pomorum* in flower galls of apples, *P. sylvenii* was reared from berries of *Juniperus*. For the moment I leave the two as valid species.

*Pteromalus tethys* spec. nov.

(figs 8-9)

Material.— Holotype: ♀ (RMNH), "ELLAS, Rhodos, A.C. & W.N. Ellis" "Lindos, 10-17.iv.1970". Paratypes: (MJG, RMNH, ZMA) GREECE: 6 ♀♀, same data as holotype; 1 ♂, same data but 20.iv.1970; 1 ♂, 1 ♀, "ELLAS FOURNOIL, 3 km S FOURNOIL, 200-300m. 15.vi.1997, J.P. Duffels"; 3 ♀♀, "ELLAS Pelopon. prov. Argolida, M.J. Gijswijt" "MIKINES, 21.iv.1989"; 2 ♀♀, ELLAS, Ster. Ell., Etolia-Akar, M.J. Gijswijt" "ANDIRIA, 21.iv.1989"; SPAIN: 1 ♂, "ISLAS BALEARES, Mallorca" "Pto de Pollensa, 10-16.vii.1969, A.C. & W.N. Ellis"; 3 ♀♀, 1 ♂, same data, 19-20.viii.1969; 1 ♀, "ISLAS BALEARES, Mallorca", "Ciudad de los Lagos, 17.viii.1969, A.C. & W.N. Ellis"; 1 ♀, "ISLAS BALEARES, Mallorca" "3 km NW v. Alcadia, 22.viii.1969, A.C. & W.N. Ellis"; 1 ♀, "ISLAS BALEARES, Mallorca" "Monasterio de Lluch, 19.viii.1969, A.C. & W.N. Ellis"; 1 ♀, "ESPANA, prov. Soria, M.J. Gijswijt" "UCERO 1100 m, on *Junip. thurif.*, 18-26.vi.1990"; 1 ♀, "Museum Leiden, Spanje, Estepona, 3.x.1952, Bär, Blöte & Osse"; FRANCE: 2 ♀♀, "FRANCE, Corse, "mondung van de Fiume Secco" "4 km O v. Calvi, 28-29.viii.1971, A.C. & W.N. Ellis", 4 ♀♀, "FRANCE, Corse, Vizzavona" "1100-1200 m, 6.viii.1978, A.C. & W.N. Ellis", 1 ♀, same data but 900-1100 m, 5.viii.1971, 1 ♀, FRANCE, CORSE, CALVI, 13-27.vii.1971", "Fam. v. Oorscot, Fam. Coene"; 1 ♀, "Museum Leiden, Corsica, 1050 m, 2 km W. v. Vizzavona, 11.viii.1956, R. Blöte"; "CYPRUS, LAPITHOS, 0-200 m, 14.vi.1971, M.J. & J.P. Duffels", 1 ♀, "CYPRUS, KYRENIA, 9.vi.1971, M.J. & J.P. Duffels".

Description of female.— Morphology: in dorsal view the head is 2.0-2.1 times as broad as long, POL:OOL=1.4-1.5, temples 1/3 of length of eye or slightly longer; in frontal view the head is 1.1-1.2 times broader than high, mal.sp. about half as long as oral fossa and 0.4-0.5 times as long as eye. Lower edge of antennal toruli situated only slightly above lower eyeline: length of lower face 0.55 times upper face. Antenna with scape 0.8 times length of eye, not reaching lower edge of median ocellus, combined length of pedicellus and flagellum as long as breadth of head or slightly shorter, F1 and F2 longer than broad, F6 slightly transverse or quadrate. Eyes 1.4-1.6 times as long as broad.

Breadth of mesosoma 0.8-0.9 times breadth of head, 1.4-1.5 times as long as broad, pronotum 0.2 times as long as mesonotum, scutellum as long as broad. Propodeum (fig. 8): length about 1/3 that of scutellum, regularly reticulate, with plicae strongly converging along hinder part, median area at least 2.3 times as broad as long. Spiracles away from frontal margin.

Forewing (fig. 9): underside of costal cell with complete hairrow, basal vein with 10-13 setae. Costal cell:M:S:PM=100:42:34:55.

Length of gaster 1.3-1.5 times combined length of head and mesosoma and about

twice as long as mesosoma. Due to severe collapse of gaster post mortem, its breadth cannot be accurately measured in any of the specimens. In the type specimens the gaster is 3-6 times as long as broad. Last tergite 1.7-2.3 times as long as basally broad.

Colour: body black, slightly coppery tinged, stronger so on sides of gaster; propodeum and first gastral tergite sometimes greenish. Antennae brown, paler beneath, in some specimens wholly brown. Femora concolorous with mesosoma, tibiae and tarsi yellowish-testaceous, mid and hind tibiae infuscate, last tarsal segments black. Wing veins brownish, tegulae brown with a black spot.

Length: 2.7-4.0 mm.

Male.— The only male specimen, supposed to be conspecific, differs from the females as follows: colour more greenish, tibiae less infuscate. POL:OOL=1.9; oral fossa 2.2 times malar space; toruli situated somewhat higher on the face: distance of lower edge to front edge of clypeus 0.7 that to median ocellus. Propodeum more regularly reticulate, its length about 2/3 that of scutellum.

Length: 2.6 mm.

Biology.— Unknown.

Notes.— *P. tethys* is related to *P. vibulenus* (Walker, 1835). It differs from that species by having longer fore wings, which at least reach apex of gaster, a longer gaster, which is twice as long as mesosoma (1.5 times in *vibulenus*), and a broader propodeum (less than twice as broad as long in *vibulenus*).

*Pteromalus villosae* spec. nov.

Material.— Holotype, ♀ (RMNH), "FRANCE-64, St. PALAIS, on *Euphorbia villosa*, 8.vi.1997, M.J. Gijswijt". Paratypes: 24 ♀♀ (MJG, RMNH, ZMA), same data as holotype.

Female.— Head in dorsal view twice as long as broad; POL 1.15-1.25 POL; OOL about twice OD; temple 0.3-0.4 apparent length of eye. In frontal view the mouth is 2.2-2.3 times malar space, the latter half as long as eye; lower face is as long as upper face. Pedicellus plus flagellum 0.9 times breadth of head; scape as long as upper face and 0.8-0.85 times as long as eye; pedicellus 1.45 times as long as broad, F1 longer than pedicellus and 1.5-1.75 times as long as broad, F2 1.2-1.4 times longer than broad, F6 transverse: 0.9 times longer than broad.

Mesosoma 0.5-0.6 times as long as broad, pronotum 0.15 length of mesonotum, scutellum about 1.3 times longer than broad, middle part of propodeum twice as long as broad or slightly broader. Forewing: costal cell: M:PM:ST=100:53:50:33.

Gaster 2.2-2.5 times longer than broad, 1.5-1.65 times longer than mesosoma; last segment as long as basally broad.

Colour: green - blue-green, tergites 1-4 of gaster with broad, 5-6 with small purplish cross bands on apical margins, tergite 7 with a broad purple band in frontal half. Scape testaceous, darkened apically, pedicellus testaceous, dorsally fulvous, F1-F2 testaceous, rest of flagellum brown, sometimes ventrally lighter. Wing veins and setae on surface dark brown. Coxae and femora green, fore tibiae testaceous, middle and hind tibiae darkened in posterior half.

Length: 3.3-3.6 mm.

Male.— Unknown.

Biology.—Associated with *Euphorbia villosa* and found piercing the fruits.

Comments.—*P.villosae* resembles *P. fuscipennis* (Walker, 1834), and can be distinguished from that species by the bare basal cell and the bright green colour.

### Acknowledgements

I acknowledge with thanks the following gentlemen: B. van Aartsen ('t Harde), who identified the Tephritid species and J. v.d. Assem (Leiden), who critically read the manuscript; many of his suggestions are incorporated. K.-J. Hedqvist (Vallentuna) and J. Noyes (London) kindly sent me type material on loan.

### References

- Graham, M.W.R. de Vere, 1969. The Pteromalidae of North-western Europe (Hymenoptera: Chalcidoidea).— Bull. Br. Mus. nat. Hist. Ent., Suppl. 16: 1-908.
- Graham, M.W.R. de Vere, 1984. New Chalcidoidea mainly from France, including several species of *Eurytoma* and *Pteromalus* associated with *Euphorbia*.— J. nat. hist., 18:495-520.
- Graham, M.W.R de Vere, 1990. Two new species of European Pteromalidae (Hym., Chalcidoidea).— Entomol. Mon. Mag. 128: 115-117.
- Hedqvist, K.-J., 1979. Two new species of the genus *Pteromalus* Swed. from Sweden (Hymenoptera: Chalcidoidea, Pteromalidae).— Ent. scand. 10: 155-157.

Received: 22.vii.1998

Accepted: 30.vii.1998

Edited: C. van Achterberg

