

The Palearctic species of the genus *Chrysopophthorus* Goidanich (Hymenoptera: Braconidae: Euphorinae)

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The genus *Chrysopophthorus* Goidanich, 1948, is reported for the first time from Northwest Europe (*C. hungaricus* (Zilahi-Kiss, 1927) from The Netherlands), and *C. petiolus* Chou, 1986 (described from Taiwan) is reported from France. The Palearctic species are keyed, partly illustrated, and new records are given.

Introduction

The genus *Chrysopophthorus* Goidanich, 1948, belongs to the *Wesmaelia*-group (= *Aridelus*-*Wesmaelia*-*Chrysopophthorus* lineage of Shaw (1984)) of the Euphorini (Shaw, 1985). It is a small genus with eight described species: three from the Neotropics, three from the Palearctic (including montane parts of Taiwan), one from the Nearctic, and one from the Oriental region. An undescribed species has been collected in Malagasy (Shaw, 1985). It is easily recognizable by the combination of the elongate cylindrical first metasomal tergite (figs 2, 9), the setose and distinctly protruding ovipositor sheath, and the presence of vein r-m of fore wing, forming a small second submarginal cell which is narrowed anteriorly or distinctly petiolate (figs 4, 11).

Recently, through the kindness of Mr M.J. Gijswijt (Ankeveen) and Mr P.L.Th. Beuk (Leiden), I received some specimens of the genus from localities which extend considerably the range of two species, one from South and Central Europe to Northwest Europe (*C. hungarica* (Zilahi-Kiss, 1927)) and one from Taiwan to France (*C. petiolus* Chou, 1986).

The knowledge of the biology of the genus is limited; they are koinobiont endoparasites of adult green lacewings (Chrysopidae). The biological range has been investigated by Séméria (1976); *C. hungarica* (Zilahi-Kiss) was reared only from *Chrysoperla carnea* (Stephens, 1836) and *Mallada* (= *Anisochrysa*; Brooks & Barnard, 1990) spp. (i.e. *M. flavifrons* (Brauer, 1851), *M. genei* (Rambur, 1842), *M. iberica* (Navas, 1903), and *M. picteti* (MacLachlan, 1880)) and not from (four) *Chrysopa* spp. The only other species reared is *Chrysopophthorus elegans* Tobias, 1961, which has been reared from *Chrysoperla carnea* (Stephens) (Tobias, 1986). According to Principi et al. (1979), *Mallada clathrata* (Schneider, 1845) and *M. prasina* (Burmeister, 1839) are also parasitized. Both sexes of adult Chrysopinae are attacked; often unsuccessfully, because of the defense reaction of the adult host. The larva emerges from the apical part of the abdomen of the host, moults (leaving the exuvia partly in the host), and has no external feeding phase. It crawls away from the host in search of a place suitable for spinning its cocoon; the cocoon is elongate, thick-walled and white. The

host may remain alive after the parasite has emerged and females remain even capable of laying eggs (Principi et al., 1979).

For a discussion on the phylogenetic relationships of the genus, see Shaw (1985). For the identification of the subfamily Euphorinae, see van Achterberg, (1990, 1993) and for the terminology used in this paper, see van Achterberg (1988, 1993).

Key to Palaearctic species of the genus *Chrysopophthorus*

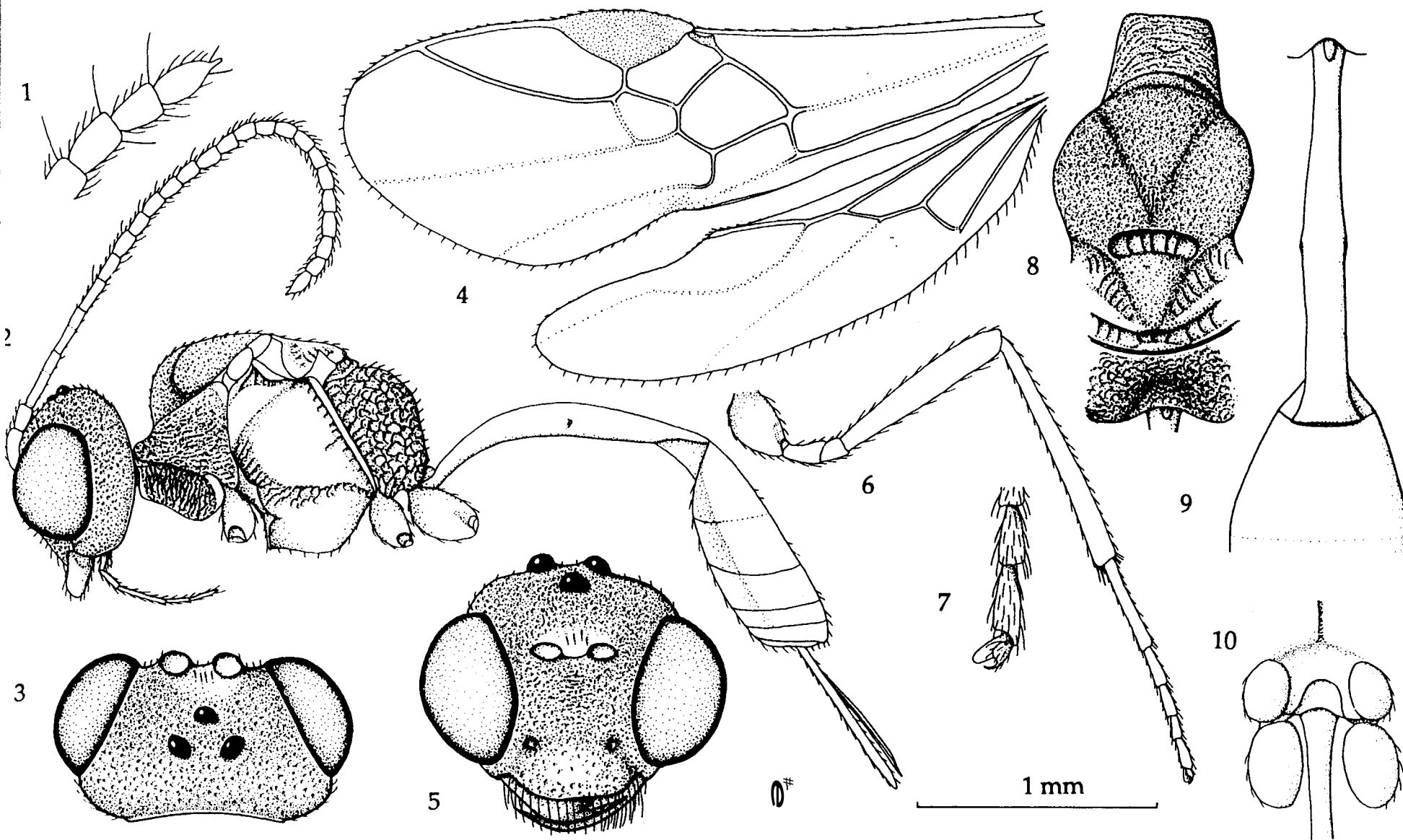
1. Distance between anterior tentorial pits about 0.9 times minimum width of face; margin of clypeus evenly curved medio-ventrally *C. elegans* Tobias
- Distance between anterior tentorial pits 0.5-0.7 times minimum width of face (figs 5/16); margin of clypeus slightly concave or straight medio-ventrally (figs 5, 16) 2
2. Second submarginal cell of fore wing sessile (fig. 4); first metasomal tergite distinctly widened apically, its length 3.6-5.6 times its apical width (fig. 9), exceptionally longer; vein SR1 of fore wing slightly curved (fig. 4); vein 1r-m of hind wing somewhat shorter than vein 1-M (fig. 4); sixth segment of maxillary palp about as long as fifth segment; temple in dorsal view somewhat shorter, compared to length of eye (fig. 3); penultimate segment of antenna of ♀ robust, about 1.5 times as long as wide (figs 1, 2); propodeum reticulate medio-posteriorly (fig. 8); middle lobe of mesoscutum similarly sculptured as lateral lobes (fig. 8); notauli shallow, usually narrow and without wide rugose area posteriorly (fig. 8) *C. hungaricus* (Zilahi-Kiss)
- Second submarginal cell of fore wing long petiolate (fig. 11); first tergite hardly widened apically, its length about 7 times its apical width (fig. 18); vein SR1 of fore wing distinctly curved (fig. 11); vein 1r-m of hind wing about as long as vein 1-M (fig. 11); sixth segment of maxillary palp about twice as long as fifth segment (fig. 17); temple in dorsal view somewhat longer, compared to length of eye (fig. 16); penultimate segment of antenna of ♀ less robust, at least twice as long as wide (figs 12, 15); propodeum smooth medio-posteriorly (fig. 14); middle lobe of mesoscutum much denser sculptured than lateral lobes (fig. 14); notauli deep, wide, with wide rugose area posteriorly (fig. 14) *C. petiolus* Chou

Descriptions

Chrysopophthorus Goidanich, 1948 (figs 1-18)

Chrysopophthorus Goidanich, 1948: 83-92; Mason, 1964: 1005-1006; Shenefelt, 1969: 29; Shaw, 1985: 315-316; Tobias, 1986: 225. Type species (by original designation): *C. chrysopiniaginis* Goidanich, 1948 (= *Heliomorpha hungarica* (Zilahi-Kiss, 1927) [examined]).

Diagnosis (largely supplementary to the diagnoses by Mason (1964) and Shaw (1985)).— Length of body 3.5-4.0 mm; antenna much shorter than body or fore wing (fig. 4), not situated on a protuberance and with 22-27 segments, apex of antenna with spine (figs 1/17), scapus medium-sized, more or less compressed and largely smooth, its apex truncate (figs 2, 12), pedicellus slightly petiolate, comparatively large (figs 2, 12); distance between antennal sockets about equal to diameter of an antennal socket



Figs 1-10, *Chrysopophthorus hungaricus* (Zilahi-Kiss), ♀, France, Grimaud, but 10 from Sospel. 1, apex of antenna; 2, habitus; 3, head, dorsal aspect; 4, wings; 5, head, frontal aspect; 6, hind leg; 7, outer hind claw; 8, mesosoma, dorsal aspect; 9, first and second metasomal tergites, dorsal aspect; 10, insertion of first tergite, ventral aspect. 1, 7: 2.5 × scale-line; 2, 4, 6: 1.0 ×; 3, 5, 8-10: 1.4 ×.

(fig. 5) or less; maxillary and labial palpi with 6 and 3 segments, respectively, labial palp short compared to maxillary palp (figs 2, 17); occipital carina complete, connected to hypostomal carina far above base of mandible (fig. 2); eyes glabrous and large (fig. 5, smaller in males); face largely flattened; clypeus wide and high (figs 5, 13); malar suture present, shallow; mandibles long, strongly twisted, overlapping each other for at least three-quarters of mandible, with long apical tooth (figs 5, 13); pronope absent or shallow and slit-like; prepectal carina complete, angulate (fig. 2); postpectal carina absent, at most tuberculate in front of middle coxa; mesosternal sulcus distinct, crenulate; precoxal sulcus complete, sculptured, shallowly impressed (fig. 2); remainder of mesopleuron largely smooth; notauli complete (fig. 14), but may be hardly impressed (fig. 8); scutellum with minute transverse depression medio-posteriorly (figs 8, 14); propodeum distinctly concave medio-posteriorly (figs 8, 14; less in males), at least laterally coarsely reticulate, without areola or median carina; vein SR1 of fore wing more or less curved; vein 1-R1 of fore wing long; veins 1-M+CU1 and 2-1A of fore wing unsclerotized; vein r of fore wing short and (sub)-vertical (figs 4, 11); vein r-m of fore wing present, usually unsclerotized (but if rather sclerotized then not distinctly tubular), and may be short (fig. 11); vein 1-SR short, oblique; parastigma rather small; pterostigma wide (fig. 4); vein m-cu of fore wing postfurcal; vein M+CU of hind wing much longer than vein 1-M; vein 1r-m of hind wing medium-sized (figs 4, 11); marginal cell of hind wing wide basally and narrow apically (fig. 11); hind coxa simple; apex of inner side of hind tibia with setal comb; tarsal claws simple, wide subbasally, short and narrow apically (fig. 7); first metasomal tergite tubular, curved in lateral view (fig. 2), and (sub)parallel-sided, very elongate (figs 9/15), its sternite immovably joined for most of its length, its dorsal and dorso-lateral carinae absent, its length 3.6-10.4 times its apical width, dorsope and laterope absent, basally flat; insertion of first tergite without lamella ventrally, condylus near bases of middle coxae (fig. 10); spiracle of first tergite submedially situated (fig. 2); metasoma smooth, at most with some oblique lateral striae of first tergite; second and following tergites enclosing sternites (fig. 2); dorsal setae of metasoma mainly in one subapical row per tergite; ovipositor distinctly protruding (fig. 2), normal, nearly straight, without teeth; length of ovipositor sheath 0.2-0.3 times fore wing; ovipositor sheath normally setose, slender, its apex membranous, acute.

Distribution.— Cosmopolitan, except Australian region.

Biology.— Koinobiont endoparasites of adult Chrysopidae-Chrysopinae.

Chrysopophthorus elegans Tobias, 1961

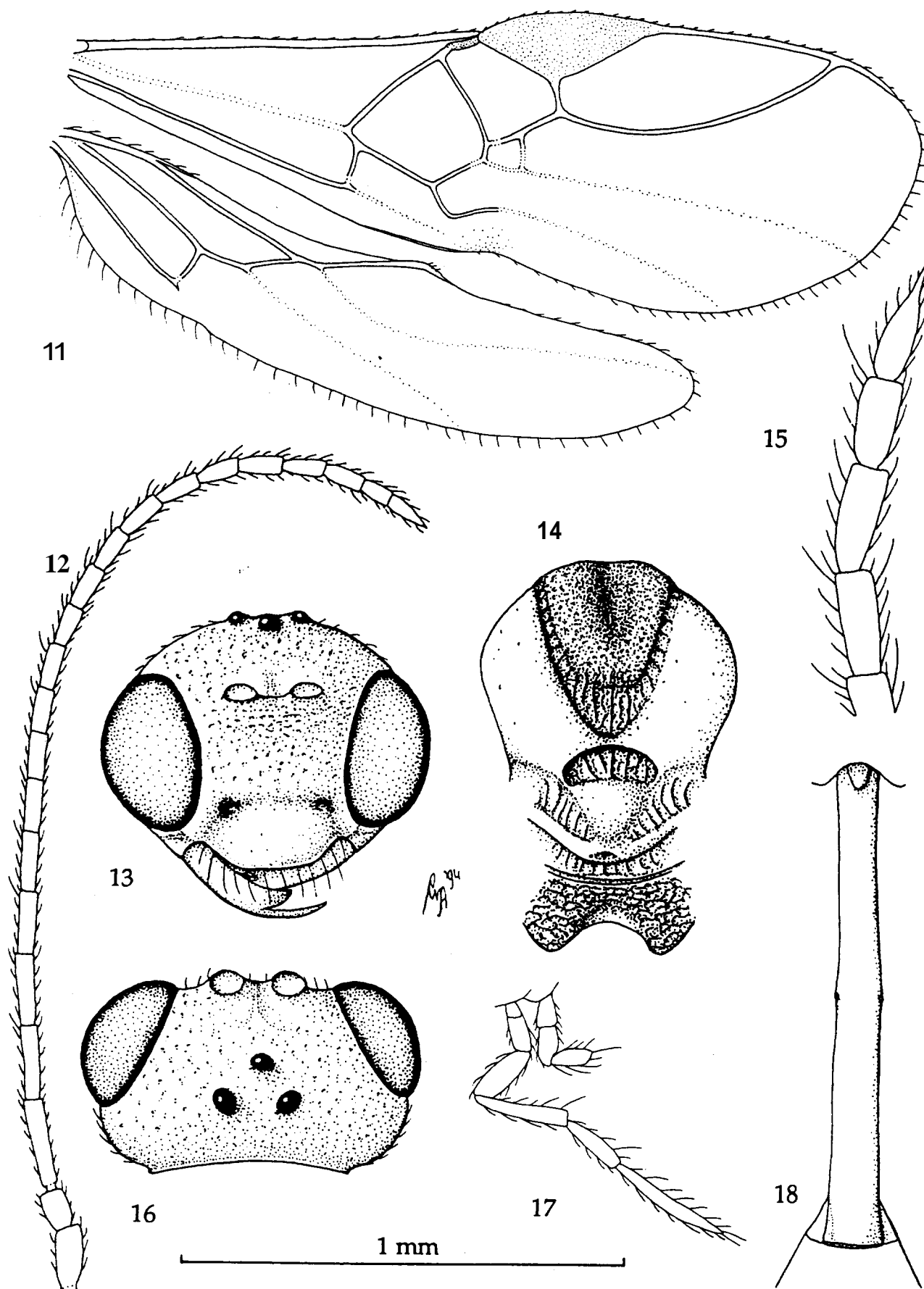
Chrysopophthorus elegans Tobias, 1961: 161; Mason, 1964: 1008 (redescription); Shenefelt, 1969: 29; Tobias, 1986: 225.

Distribution.— Azerbaidzhan, Moldavia.

Note.— No specimens were available; the interpretation of this species is based on Mason's (1964) notes.

Chrysopophthorrshungaricus (Zilahi-Kiss, 1927) (figs 1-10)

Heliomorpha hungarica Zilahi-Kisc, 1927: 15-16[examined].



Figs 11-18, *Chrysopophthorus petiolus* Chou, 9, France, Montréal les S. 11, wings; 12, antenna; 13, head, frontal aspect; 14, mesosoma, dorsal aspect; 15, apex of antenna; 16, head, dorsal aspect; 17, maxillary and labial palpi; 18, first metasomal tergite, dorsal aspect. 11:0.7 x scale-line; 12-14, 16, 18: 1.0 x; 15:2.5 x; 17: 1.7 x.

Chrysopophthoriis hungaricus; Macon, 1964: 1008 (redescription of holotype); Shenefelt, 1969: 29; Tobias, 1986: 225.

Chrysopophthorris chrysopimuginis Goidanich, 1948: 83-92; Macon, 1964: 1008 (synonymy); Séméria, 1976: 102-127; Principi et al., 1979: 248-272.

Material. — 1 ♂ (RMNH), "NL [= Netherlands], Happert (N-B), Cartierheide [= heath], Am[ersfoort]-coor.: 146/7-370, 5.vi.1994, P.L.Th. Beuk"; 1 ♀ (RMNH), "France (Var), Grimaud, 11.ix.1986, M.J. Gijswijt, RMNH'86"; 1 ♀ (RMNH), "France (06), Cospel, 1.vi.1991, M.J. Gijswijt"; 1 ♀ (RMNH), "France Drôme, M.J. Gijswijt", "Arpavon, 10 km E Nyons, 19.ix.1987, on *Tilia*"; 1 d (RMNH), "France, Drôme, M.J. Gijswijt", "4 km SW Séderon, on *Tilia*, 29.ix.1987"; 3 ♂ (RMNH), "España, Prov. Jaén, M.J. Gijswijt", "Sa. de Cazorla Cabanas, 1500 m, 25.v.1992"; 1 ♀ (RMNH), "Italia-Mar. prov. Pes. & Ur., M.J. Gijswijt", "Fossombrone, 20.v.1993"; 1 ♂ (RMNH), "Museum Leiden, S. Greece, Lakonia, 7 km S. of Monemvasia, 10.vii.1980, G. Christensen"; 1 ♀ (RMNH), "Islas Canarias, Los Cristianos, 10-20.iii.1980, J.B. Woischrijn".

The redescription by Mason (1964) may be enlarged as follows: length of body **3.2-4.1** mm, of fore wing **2.5-3.3** mm; antennal segments of ♀ **22(1), 23(2), 24(1), 25(2)**, and of ♂ **21(1), 23(1), 24(5)**; length of third antennal segment of ♀ **1.2-1.3** times fourth segment, penultimate segment of ♀ about **1.5** times its width (fig. 1); sixth segment of maxillary palp about as long as fifth segment; distance between anterior tentorial pits 0.6-0.7 times minimum width of face (fig. 5); length of malar space 0.3 times basal width of mandible; margin of clypeus straight or slightly concave medially (fig. 5); propleuron and complete propodeum coarsely rugose; marginal cell of hind wing parallel-sided apically; vein 1r-m of hind wing somewhat shorter than vein 1-M; length of first metasomal tergite **3.6(♂)-5.6(♀)** times its apical width (according to Mason (1964) upto 8 times); length of ovipositor sheath **0.22-0.26** times fore wing.

Distribution.— Azerbaijan, Czechia, France, Greece, Hungary, Italy, Netherlands, Romania, Spain (including Canary Islands).

Note.— Unknown from the boreal zone; the record from The Netherlands is the first from Northwest Europe. It seems unlikely to be an accidental introduction considering the habitat where the specimen was found and the absence of strong southern winds in the weeks before its collection.

Chrysopophthorus petiolus Chou, 1986
(figs 11-18)

Chrysopophthorus petiolus Chou, 1986: 159-161, figc 1-9.

Material.— 1 ♀ (RMNH), "France, Drôme, M.J. Gijswijt", "Montréal lec S., 13 km ENE Nyons, 16.ix.1987".

The French specimen differs from the original description (Chou, 1986) as follows (in brackets data from Chou (1986)): length of eye in dorsal view 1.8 times temple (**2.2-2.4** times); distance between anterior tentorial pits 0.55 times minimum width of face (0.6-0.7 times); face, frons, vertex and temple sparsely punctate (figs 13, 16; densely punctate); middle lobe of mesoscutum with median depression (fig. 14; according to fig. 4 in Chou (1986) absent or nearly so); length of marginal cell of fore wing **2.8** times its maximum width (fig. 11; according to fig. 9 (l.c.) 2.6 times); petiolus of second submarginal cell of fore wing distinctly longer than oblique part of vein 2-SR (fig. 11; of about equal length); length of first metasomal tergite 7.1 times

its apical width (8.8-9.0 times); precoxal sulcus, dorsally mesosoma (behind mesoscutum), metapleuron and metasoma (behind first tergite) dark brown (yellowish-brown to brownish); length of ovipositor sheath 0.27 times length of fore wing (0.28 times). The differences are likely to be clinal, so I refrain from naming the specimen from France as a new species.

Distribution.— Taiwan, France.

Acknowledgements and abbreviations

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