

# The braconid parasitoids (Hymenoptera: Braconidae) of *Kermania pistaciella* Amsel (Lepidoptera: Tineidae: Hieroxestinae) in Iran

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Key words: Hymenoptera; Braconidae; *Chelonus*; *Microchelonus*; *Centistidea*; *Paracentistidea*; Lepidoptera; Tineidae; *Kermania pistaciella*; pistachio twig borer moth; new species; Palaearctic; Iran.

Two species of Braconidae (*Chelonus kermakiae* (Tobias, 2001) (Cheloninae) and *Centistidea pistaciella* spec. nov. (Miracinae)) have been reared from the pistachio twig borer moth (*Kermania pistaciella* Amsel) (Tineidae). Both species are described and illustrated; *Centistidea pistaciella* spec. nov. is included in a new subgenus (*Paracentistidea* subgen. nov. with *C. pistaciella* spec. nov. as type species) and a key to the Palaearctic and North Oriental species of the genus *Centistidea* Rohwer is added.

## Introduction

The pistachio twig borer moth, *Kermania pistaciella* Amsel, 1964 (Lepidoptera: Tineidae: Oinophilini), has been a minor pest in pistachio orchards in Iran. Owing to frequent spraying of chemicals (including insecticides) between 1970-1990, since 1980 it has become an important pest in Iran (Mehrnejad, 2002), as it is now in Turkey (Mart et al., 1995). The adult moth appears in late March-early April to lay its eggs in flower and fruit clusters, and during high pest populations also on new shoots and petioles. The newly hatched larvae directly penetrate into the cluster tissues from which they bore into the twigs. It causes severe economic damage by fruit drop and twig weakening. There is one generation per year (Mehrnejad, 2001).

Cocoons of *K. pistaciella* were collected once a week in five different pistachio production areas of Rafsanjan, the main pistachio plantation region of Iran. The sampling period was from 10 March to 20 April in 1995, 1999 and 2000; during the latter year an additional four areas were sampled. A sample of minimally 100 cocoons were collected from the twigs and every cocoon was kept in a single vial and stored under controlled conditions (24°-26°C). In total, 13,365 cocoons were collected of which 45.5% were found to be parasitised. The most common parasitoid was a koinobiont endoparasitoid belonging to the genus *Chelonus* Panzer, 1806 (= *Microchelonus* Szépligeti, 1908; Hymenoptera: Braconidae: Cheloninae) described as *Microchelonus kermakiae* by Tobias (2001). It accounted for 82.5% of the total parasitism and was present between 12.3-50.8% (mostly 37-50%) of the host cocoons per sample. Only one other braconid parasitoid was found and this only rarely: a species of the genus *Centistidea* Rohwer, 1918 (Braconidae: Miracinae) was four times reared. The braconid cocoons were attacked by secondary parasitoids (Ichneumonidae: Cryptinae): *Gelis exareolatus* (Foer-

ster, 1850) (4.5% of the total parasitism) and *Gelis liparae* (Giraud, 1863) (2.4%). The ectoparasitoid *Dibrachys boarmiae* (Walker, 1863) (= ? *cavus* (Walker, 1835); Chalcidoidea) accounts for 6.0% (it may be a hyperparasitoid of the Braconidae), and a *Pteromalus* spec. for 4.5% (Mehrnejad, 2002).

In addition, ants and spiders predated the moth's cocoons in the field. Ants and spiders climbed up the trees and made an irregular hole on the cocoons, then fed upon the larvae and pupae of both moth or wasp. The activity of these predators was significant particularly where the pistachio orchards were kept free of chemical application. *Dibrachys boarmiae* has been reared and released in 2000 and 2001 with an effectiveness of 75%. A combined release with the endoparasitoid *Chelonus kermakiae* (Tobias) may make the biological control of the pistachio twig borer moth even more effective.

*Chelonus kermakiae* (Tobias, 2001) **comb. nov.** is redescribed and illustrated below, because it has been only described in a key (in Russian), without any figures of the male (Tobias, 2001) and with few figures of the female. The original description is based on a small series (2 ♂♂ + 2 ♀♀) reared from "*Kermakia* sp." (miswriting for *Kermania*) and the gelechiid moth *Schneidereria pistaciicola* (Danilevsky, 1955). In addition *Centistidea pistaciella* spec. nov. is described and illustrated because biological information on members of the genus *Centistidea* Rohwer is rare and this record is important for understanding the biological relations within the Miracinae. So far most host records concern mining larvae of Nepticulidae, but members of the genus *Centistidea* obviously occur on other hosts.

For recognition of the subfamilies Cheloninae and Miracinae, see van Achterberg (1990, 1993, 1997), for a key to the genera of Cheloninae, see Zettel (1990), and for the terminology used in this paper, see van Achterberg (1988).

## Descriptions

### Subfamily Cheloninae Foerster, 1862

#### Genus *Chelonus* Panzer, 1806

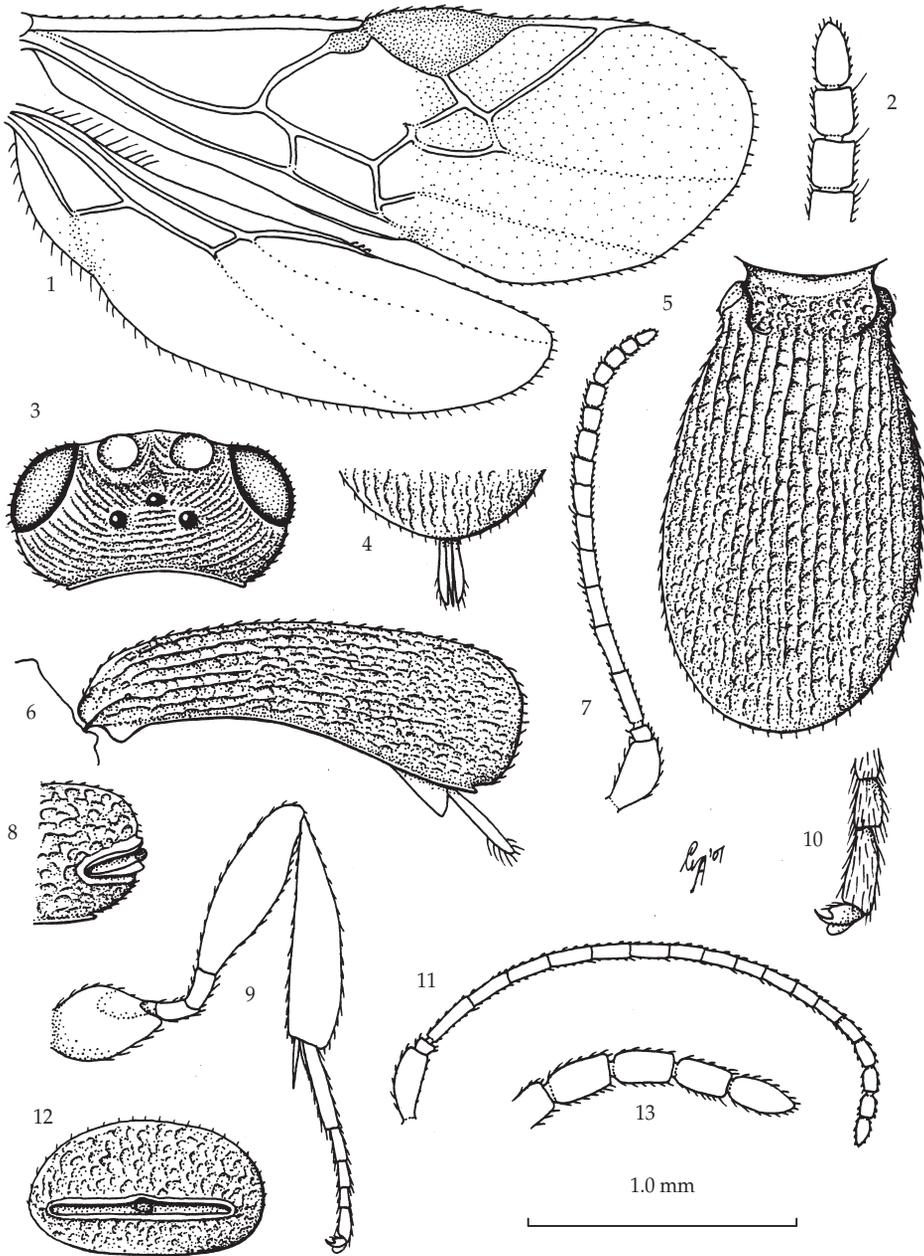
#### *Chelonus kermakiae* (Tobias, 2001) comb. nov. (figs 1-13)

*Microchelonus kermakiae* Tobias, 2001: 149 (in key, ♀), 153 (in key, ♂).

Material.—Redescribed ♀ (RMNH), "Iran, Rafsanjan, ex *Kermania pistaciella* (Tineidae) on *Pistacia vera*, 25.iii.2000, R. Mehrnejad RMNH'00". Additional specimens (RMNH, TMA, ZISP, NMS): 31 ♀♀ + 21 ♂♂, topotypical and from same host. Identification confirmed by Dr V.I. Tobias.

Holotype, ♀, length of body 2.7 mm, of fore wing 3.4 mm.

Head.—Antenna hardly widened submedially (fig. 7), with 16 segments, scapus twice as wide as third segment (fig. 7), length of third segment 1.2 times fourth segment, third, fourth and penultimate segments 3.4, 2.6 and 1.7 times their maximum width, respectively (figs 2, 7); length of maxillary palp 0.4 times height of head; face slightly convex, finely and largely obliquely rugose; clypeus finely and rather remotely punctate, with smooth interspaces, straight medio-ventrally, without tubercle; frons weakly concave, largely superficially rugulose, laterally distinctly rugose, without



Figs 1-13, *Chelonus kermakiae* (Tobias), ♀ (but 8, 11-13 of ♂), Iran, Rafsanjan. 1, wings; 2, 13, apex of antenna; 3, head, dorsal aspect; 4, apex of carapace, dorso-apical aspect; 5, carapace, dorsal aspect; 6, carapace, lateral aspect; 7, 11, antenna; 8, apex of carapace, lateral aspect; 9, hind leg; 10, inner hind claw; 12, apex of carapace, apical aspect. 1, 3-9, 11, 12: 1.0 × (= scale-line); 2, 10, 13: 2.5 ×.

median carina (fig. 3); vertex finely transversely rugose; OOL:diameter of posterior ocellus:POL = 6 (or 10 if measured horizontally):3:10; in dorsal view length of eye 1.6 times temple; temples directly narrowed behind eyes and densely rugulose (fig. 3); occipital carina complete, medium-sized and dorsally curved; length of malar space 1.2 times basal width of mandible.

Mesosoma.— Length of mesosoma 1.3 times its height; side of pronotum coarsely punctate-reticulate; propleuron coarsely reticulate-rugose; side of mesoscutum reticulate; mesopleuron medially and dorsally coarsely rugose-reticulate, ventrally rather coarsely and densely punctate; mesosternum more sparsely punctate; mesosternal sulcus smooth and narrow anteriorly, disappearing in coarsely rugose area posteriorly; metapleuron coarsely reticulate; mesoscutum medio-posteriorly coarsely rugose, laterally and along notaulic courses widely rugose, in between courses rather remotely punctate, interspaces smooth and partly larger than diameter of punctures; middle lobe of mesoscutum with punctate-reticulate median band; scutellum weakly convex and longitudinally rugose; side of scutellum coarsely crenulate; metanotum medio-posteriorly obtusely protruding; propodeum reticulate, with short median carina anteriorly, posterior part almost perpendicular to short dorsal part, with pair of minute blunt teeth medio-posteriorly and lateral teeth obsolescent.

Wings.— Fore wing (fig. 1): r:3-SR:SR1 = 5:5:26; 2-SR:3-SR:r-m = 9:5:5; 1-R1 0.65 times as long as pterostigma; 2-R1 0.3 times vein 1-R1; 1-M evenly curved; basal half of wing normally yellowish setose, but slightly less setose than dark brown setose apical half of wing. Hind wing: cu-a reclivous; M+CU:1-M:1r-m = 27:18:5.

Legs.— Hind coxa punctulate, largely smooth; tarsal claws rather small and with medio-ventral lobe (fig. 10); length of femur, tibia and basitarsus of hind leg 3.1, 4.8 and 5.1 times their maximum width, respectively; hind tibia only densely setose; hind tibial spurs 0.4 and 0.5 times as long as hind basitarsus; second-fourth segments of fore tarsus comparatively slender and telotarsus distinctly enlarged (fig. 5).

Metasoma.— First tergite rather coarsely longitudinally rugose, as long as its apical width, widened subbasally because of flange-like dorsal carinae (fig. 5); in dorsal view carapace 1.75 times as long as its maximum width, elliptical (fig. 5); second and third tergites densely finely rugose-reticulate (fig. 5); third tergite rounded apically (fig. 4) and in lateral view subtruncate and ventral opening remains 0.1 times of length of carapace removed from apex (fig. 6); in lateral view carapace apically 1.7 times higher than basally; ovipositor straight, its sheath 0.11 times as long as fore wing (fig. 6).

Colour.— Black; first metasomal tergite largely ivory, except laterally; scapus, and ventrally second-seventh antennal segments orange-brown, dorsally more or less infuscate and remainder of antenna dark brown; palpi yellowish-brown; coxae largely dark brown or blackish; telotarsi dark brown, contrasting with remainder of yellowish tarsi; femora, trochanters and trochantelli brownish, but hind femur largely dark brown; hind tibia with faint dark subbasal and apico-dorsal patches, remainder of legs brownish-yellow with middle and hind tibial spurs whitish; tegulae, pterostigma and viens of apical half of fore wing dark brown; veins of basal half of fore wing and of hind wing yellow; parastigma yellow and contrasting with pterostigma.

Male.— Very similar to female; apical opening of metasoma about 11 times wider than high in apical view (fig. 12), occupying apical 0.2 of carapace in lateral view (fig.

8); subapical antennal segments about twice as long as wide (fig. 13); hind femur largely yellowish; antennal segments 18(5), 19(12) or 20(2).

Variation.— Length of fore wing of ♀ 2.3–2.7 mm, and of body 3.2–3.4 mm; second-seventh antennal segments brown ventrally, more or less infucate; ivory patch of first tergite may be anteriorly narrow petiolate or covering complete first tergite, rarely also second tergite ivory medio-basally; length of fore wing ♂ 2.5–2.7 and of body 3.0–3.7 mm; first tergite basally largely or completely dark brown; antennal segments (except scapus ventrally) more or less dark brown or antenna basally yellowish as in females.

Notes.— This species fits in the genus *Microchelonus* Szépligeti as used by e.g., Tobias (1986, 2001), but this genus is not tenable (probably even not as subgenus); see van Achterberg & Polaszek (1996) and Braet & van Achterberg (2001). *C. kermakiae* is characterized by having the metasomal apical opening of the male very transverse (figs 8, 12), the hind tibia, tarsus and parastigma pale, the vein r of fore wing almost as long as vein 3-SR (fig. 1), and the scapus and third antennal segment comparatively slender and yellowish in the female. A similar wide slit-like opening of the male carapace is present in *Chelonus cereris* (Wilkinson, 1932) from South Africa, but this species has the second metasomal tergite distinctly rugose-striate, the mesoscutum more coarsely sculptured, the hind leg completely dark brown and the parastigma infuscate.

In the key by Tobias (1986) the species runs to *Chelonus vescus* Kokujev, 1899, which is a replacement name for *C. minutus* Szépligeti, 1889 (not Costa, 1884). *C. vescus* was described from Hungary and the male lectotype should be in TMA (under no. 549) but was not available for study when the first author visited Budapest. Instead two females from Hungary and Albania identified by Dr J. Papp as *C. vescus* were examined, which are not conspecific with the *Chelonus* from *Kermania pistaciella*; the metasoma is more robustly oval and evenly dark brown, and is basally more slender, the parastigma, hind tarsus and base of the antenna are dark brown, and the hind tibia is basally and submedially slightly paler but largely dark brown.

Specimens of *Chelonus silvestrii* Papp, 1998 (= *C. orientalis* Silvestri, 1907, not Szépligeti, 1902, and described from Turkey) from Israel and Yemen differ by having a smaller apical opening of the carapace of the male (about 2.5 times wider than high), the antenna basally and apical half of the hind tibia dark brown, and vein r of the fore wing longer than vein 3-SR.

*Chelonus naethrus* Narendran & Sumodan, 1992, from India has the hind femur, apical third and base of the hind tibia dark brown, the propodeal tubercles distinctly acute and medium-sized, the mesoscutum very coarsely rugose-reticulate, and the first and second metasomal tergites rather coarsely longitudinally striate.

*Chelonus versatilis* Wilkinson, 1932, from Sudan has much darker legs and the apical opening of the carapace of the males is distinctly wider. Males of *C. incisus* Tobias, 1986, from Russia (Central Ural region) have similarly pale hind tibia and wide opening of the carapace but the male antenna has 23–24 segments, with the subapical segments only slightly longer than wide, vein 1-R1 of fore wing about as long as the pterostigma, the metasoma (except for its apical third) longitudinally rugose, the head densely punctate dorsally and the mesoscutum (except posteriorly) densely punctate.

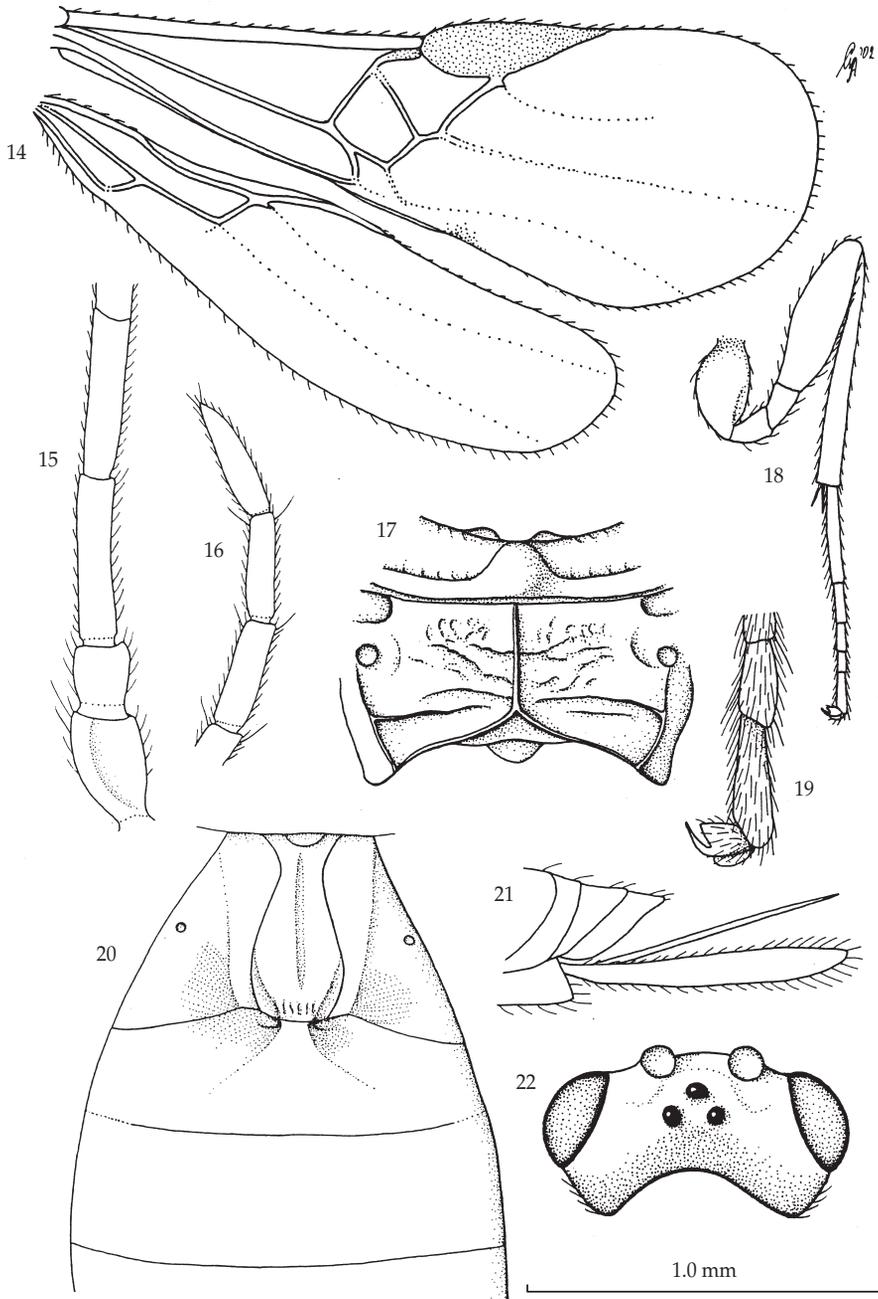
**Subfamily Miracinae Viereck, 1918**  
**Genus *Centistidea* Rohwer, 1914**  
 (figs 14-29)

This genus is very similar to (and frequently included in) the genus *Mirax* Hali-day, 1833 (a genus containing parasitoids of small leaf miners, mainly Nepticulidae), but can be separated by having the dorsal face of the propodeum with a strong median carina (figs 17, 24), if rarely largely absent then antero-medially the propodeum is rugose; posterior depressions of the scutellum medium-sized to large, and close to each other in the subgenus *Centistidea*, if obsolescent (fig. 24) or narrow and widely removed from each other (fig. 17) (= members of the new subgenus *Paracentistidea*), then the tarsal claws with a distinct lobe (fig. 19); notauli usually shallowly impressed anteriorly. *Centistidea pistaciella* spec. nov. is the first species of the genus known to parasitize boring Tineidae.

Distribution.— Almost cosmopolitan (not yet known from the NW Palaearctic and Afrotropical regions).

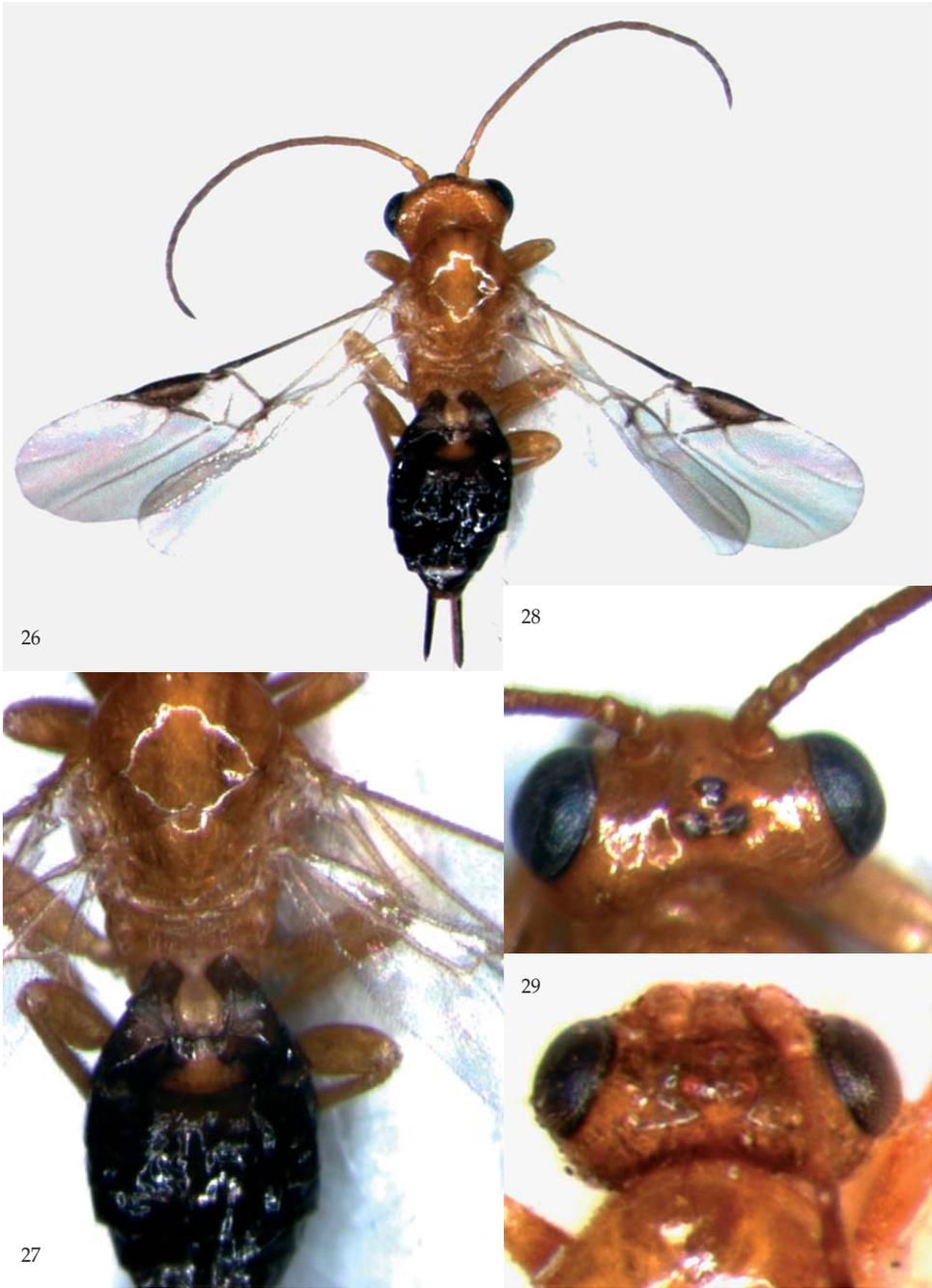
**Key to Palaearctic and North Oriental species of the genus *Centistidea* Rohwer**

1. Posterior depressions of scutellum narrow or obsolescent and widely separated (figs 17, 24); setose part of ovipositor sheath about twice as long as first tergite (or hind basitarsus; fig. 21); wing membrane (except basally) moderately infuscate (fig. 26); notum of first metasomal segment comparatively robust, hardly narrowed posteriorly, 1.8-2.5 times as long as its maximum width (figs 20, 23, 27); first tergite medially yellowish and laterally brown (fig. 26); second tergite largely sclerotized, without fine striations; mesosoma completely yellowish (fig. 26); pair of membranous spots of side of pronotum obsolescent; tarsal claws with distinct lobe (fig. 19); parasitoids of Tineidae; SW Palaearctic; subgenus *Paracentistidea* nov. .... 2
- Posterior depressions of scutellum large and almost touching each other; setose part of ovipositor sheath about as long as first tergite (or hind basitarsus) or shorter; wing membrane subhyaline; notum of first segment more slender, distinctly narrowed posteriorly, 2.4-4.0 times as long as its maximum width; first tergite unicolourous; second tergite with fine striations laterally; mesosoma usually at least partly brownish or blackish; pair of membranous spots of side of pronotum distinct; tarsal claws simple; parasitoids of Gracillariidae; E Palaearctic; subgenus *Centistidea* Rohwer ..... 3
2. Medial area of first metasomal tergite distinctly widened subapically and its length 1.8-2.1 times its maximum width (figs 20, 27); propodeum with transverse elements, including distinct transverse carina connected to lateral carina (fig. 17); medio-posterior depressions of more or less developed (fig. 17); head more transverse (fig. 28); Iran; [parasitoid of Tineidae] ..... *C. pistaciella* spec. nov.
- Medial area of first tergite subparallel-sided and its length about 2.5 times its maximum width (fig. 23); propodeum longitudinally striate, sculpture without transverse elements, and no distinct transverse carina connected to lateral carina (fig. 24); medio-posterior depressions of obsolescent (fig. 24); head less transverse (fig. 29); Afghanistan ..... *C. tortilis* (Papp, 1984) comb. nov.



Figs 14-22, *Centistidea pistaciella* spec. nov., ♀, holotype. 14, wings; 15, base of antenna; 16, apex of antenna; 17, metanotum and propodeum, dorsal aspect; 18, hind leg; 19, inner hind claw; 20, first-third metasomal tergites, dorsal aspect; 21, ovipositor sheath, lateral aspect; 22, head, dorsal aspect. 14, 18: 0.8 ×; 15, 16, 20: 1.8 ×; 17: 1.7 ×; 19: 2.5 ×; 21, 22: 1.0 × (= scale-line).

3. Median carina of propodeum absent or nearly so, propodeum rugose medially and smooth laterally (fig. 13 in Papp & Chou, 1996); China (Taiwan) ..... *C. fereta* (Papp & Chou, 1996) comb. nov.
  - Median carina of propodeum at most posteriorly absent, at least 0.5 times length of propodeum in dorsal view and no isolated rugosity medially (cf. fig. 17) ..... 4
4. Vein 1-R1 of fore wing distinctly vein-like (fig. 12 in Maetô, 1995); dorsal length of eye 1.1-1.2 times temple (fig. 4 l.c.); head yellowish; Japan; [parasitoid of Gracillariidae] ..... *C. sii* (Maetô, 1995)
  - Vein 1-R1 of fore wing absent or nearly so, pterostigma without vein-like appendix, at most triangularly protruding (fig. 11 in Maetô, 1995); dorsal length of eye 1.2-2.4 times temple (fig. 3 l.c.), if 1.2-1.3 times then head rusty brown ..... 5
5. Third antennal segment 1.3-1.6 times as long as fourth segment (fig. 6 in Papp & Chou, 1996); mesoscutum blackish-brown ..... 6
  - Third antennal segment 1.0-1.1 times as long as fourth segment (fig. 7 l.c.); colour of mesoscutum variable ..... 7
6. Median carina of propodeum absent behind level of costulae and its antero-dorsal part about 1.5 times as long as metanotum medially; vein 1-SR of fore wing distinctly developed, up to 0.4 times as long as vein 1-M; Japan, Korea, Far East Russia ..... *C. irruptor* (Papp, 1987)
  - Median carina of propodeum present behind level of costulae and its antero-dorsal part about 2.5 times as long as metanotum medially (fig. 27 in Papp & Chou, 1996); vein 1-SR of fore wing less developed, up to 0.2 times as long as vein 1-M; China (Taiwan) ..... *C. taiwanica* (Papp & Chou, 1996)
7. Median carina of propodeum absent behind level of costulae (fig. 13 in Maetô, 1995); mesoscutum yellowish, at most with brownish tinge ..... 8
  - Median carina of propodeum present behind level of costulae (fig. 14 in Maetô, 1995); mesoscutum more or less dark brown ..... 9
8. Vein 1-CU1 of fore wing almost as long as vein 2-CU1 and widened; hind basitarsus robust, about 4 times as long as wide in lateral view and second segment about 1.5 times; Far East Russia and Mongolia to Taiwan and Vietnam (Tonkin) .... *C. mogra* (Papp, 1987)
  - Vein 1-CU1 of fore wing about 0.7 times as long as vein 2-CU1 and slender; hind basitarsus less robust, at least 5 times as long as wide in lateral view and second segment about 3 times; China (Guizhou) ..... *C. zhaoi* Chen & He, 1997
9. Dorsal length of eye 1.5-1.7 times temple; dorsally head yellowish; costulae of propodeum weaker than median carina (fig. 14 in Maetô, 1995); Japan; [parasitoid of Gracillariidae] ..... *C. kumatai* (Maetô, 1995)
  - Dorsal length of eye 1.2-1.3 times temple; dorsally head brown and/or blackish; costulae of propodeum about as strong as median carina ..... 10
10. Notum of first metasomal segment about 2.5 times its maximum width and maximum width about 1.5 times its minimum width (figs 5-8 in Belokobylskij, 1989); anterior part of median carina of propodeum (= part of carina in front of costulae) about as long as its posterior part; vein 1-CU1 of fore wing widened; third antennal segment about 1.2 times length of fourth segment; vein r of fore wing obsolescent; Far East Russia ..... *C. sculpturator* (Belokobylskij, 1989)
  - Notum of first segment about 4.0 times its maximum width and maximum width



Figs 26-28, *Centistidea pistaciella* spec. nov., ♀, holotype; fig. 29, *C. tortilis* (Papp), ♂, holotype. 26, habitus, dorsal aspect; 27, detail of mesosoma and base of metasoma, dorsal aspect; 28, 29, head, dorsal aspect.

about 3.0 times its minimum width (fig. 1 in Wu et al., 2000); anterior part of median carina of propodeum at least twice as long as its posterior part; vein 1-CU1 of fore wing slender; third antennal segment about as long as fourth segment; vein r of fore wing medium-sized; China (Hubei) .... *C. immittis* Wu, Chen & Huang, 2000

### Subgenus *Paracentistidea* van Achterberg, nov.

Type species: *Centistidea pistaciella* spec. nov.

Etymology.— From “para” (Greek for “near”) and the generic name *Centistidea* Rohwer. Gender: feminine.

Diagnosis.— Pair of membranous spots of side of pronotum obsolescent; pair of posterior depressions of scutellum narrow or obsolescent and widely separated (figs 17, 24); mesosoma completely yellowish (fig. 26); wing membrane (except basally) moderately infusate; tarsal claws with distinct lobe (fig. 19); notum of first metasomal segment comparatively robust, hardly narrowed posteriorly, 1.8-2.5 times as long as its maximum width (figs 20, 23, 27); second tergite largely sclerotized, without fine striations (fig. 27); setose part of ovipositor sheath about twice as long as first tergite (or hind basitarsus; fig. 21).

Distribution.— SW Palaearctic (two species).

Biology.— Parasitoid of boring larvae of Tineidae.

*Centistidea (Paracentistidea) pistaciella* spec. nov.

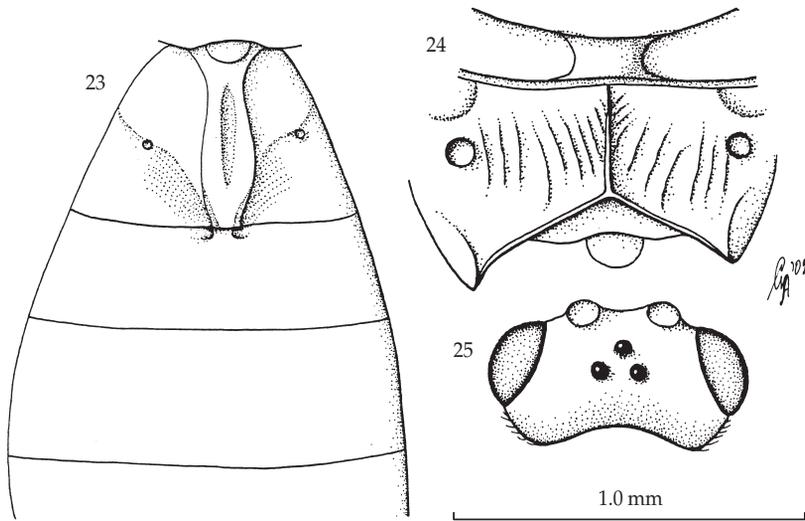
(figs 14-22, 26-28)

Material.— Holotype, ♀ (RMNH), “Iran, Rafsanjan, ex *Kermania pistaciella* (Tineidae) on *Pistacia vera*, 25.iv.2000, R. Mehrnejad RMNH’00”. Paratypes (RMNH): 3 ♀♀, topotypical and from same host.

Holotype, ♀, length of body 2.7 mm, of fore wing 2.8 mm.

Head.— Antenna with 14 segments, slender, scapus compressed and apically subtruncate (fig. 15); third segment as long as fourth segment, third, fourth and penultimate segments 4.3, 4.3 and 3.0 times their maximum width, respectively (figs 15, 16); length of maxillary palp with 4 visible segments (and labial palp with 3 visible segments), and 0.7 times height of head; face distinctly convex medially, flattened laterally, smooth; clypeus 1.7 times wider ventrally than high, smooth and evenly convex, ventral margin straight medially, thin and lamelliform; frons weakly concave behind antennal sockets, medially slightly convex, smooth, without median carina (fig. 22); vertex flattened, smooth, sparsely setose and stemmaticum protruding; OOL:diameter of posterior ocellus:POL = 10:3:4; in dorsal view length of eye 1.6 times temple; temples directly narrowed behind eyes and smooth (figs 22, 28); malar suture distinct; length of malar space 1.8 times basal width of mandible; mandible distinctly twisted, and second tooth nearly as long as first tooth.

Mesosoma.— Length of mesosoma 1.1 times its height; side of pronotum and propleuron smooth; pronotum vertical anteriorly and without pronope; side of mesoscutum smooth, without carina; mesopleuron smooth; mesosternal sulcus smooth and obsolescent; metapleuron smooth, convex, with large pit antero-dorsally; mesoscutum sparsely setose, smooth; notauli only anteriorly shallowly impressed;



Figs 23-25, *Centistidea tortilis* (Papp), ♂, holotype. 23, first-third metasomal tergites, dorsal aspect; 24, metanotum and propodeum, dorsal aspect; 25, head, dorsal aspect. 23: 1.8 ×; 24: 2.5 ×; 25: 1.0 × (= scale-line).

scutellar sulcus absent, except for indistinct suture and minute pit; scutellum weakly convex and smooth, medio-posteriorly with pair of small incisions and depressions, removed from each other by width of depression (fig. 17); side of scutellum superficially rugulose; metanotum medially distinctly convex, convexity reaching up to scutellum (fig. 17); propodeum with coarse and somewhat irregular and complete median carina, surrounded by transverse and oblique incomplete carinae, and laterally with distinct costa-like carinae (fig. 17), posterior part not well differentiated from dorsal part.

Wings.— Fore wing (fig. 14): r obsolescent; SR1 only unpigmented, largely absent; 2-SR about as long as width of pterostigma; 1-R1 obsolescent; 1-M 1.9 times as long as m-cu. Hind wing: cu-a weakly reclivous; M+CU:1-M:1r-m = 22:16:5.

Legs.— Hind coxa smooth; tarsal claws rather large and with large acute lobe (fig. 19); length of femur, tibia and basitarsus of hind leg 3.5, 11.8 and 5.4 times their maximum width, respectively (fig. 18); hind tibia densely setose; hind tibial spurs 0.25 and 0.30 times as long as hind basitarsus; hind tarsus distinctly compressed.

Metasoma.— Length of first tergite 1.9 times its maximum width and 2.5 times its apical width, distinctly widened after basal constriction (figs 20, 27); second tergite smooth, except for basal fine striations, largely sclerotised, without well-defined medial area (fig. 20); medial length of second tergite 0.8 times median length of third tergite; third tergite smooth; ovipositor straight, its sheath 0.32 times as long as fore wing and distinctly widened, but narrowed apically (fig. 21).

Colour.— Yellow; metasoma (except sclerotised part of first tergite and second tergite medio-basally) and ovipositor sheath, blackish-brown; antenna (except yellow scapus and pedicellus), palpi and legs pale yellowish; most veins and pterostigma

dark brown, but veins of basal fifth of fore wing yellowish; wing membrane moderately infusate, basally slightly less than apically.

Variation.— Length of body 2.7-2.8 mm, and of fore wing 2.7-2.8 mm; length of first tergite 1.8-2.1 times its maximum width and 2.0-2.7 times its apical width; length of ovipositor sheath 0.29-0.32 times length of fore wing; second metasomal tergite may be completely dark brown (similar to *C. tortilis*).

Note.— The new species is closely related to *C. tortilis* (Papp, 1984) **comb. nov.** of which only the male holotype from Afghanistan is known; *C. tortilis* has the sclerotised part of the first tergite much more slender (fig. 23); the head less transverse (figs 25, 29) and the sculpture of the propodeum lacks transverse elements and costa-like carinae (fig. 24).

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RMNH stands for the Nationaal Natuurhistorisch Museum, Leiden; NMS for the National Museums of Scotland (Edinburgh); TMA for the Hungarian Museum of Natural History (Budapest) and ZISP for the Zoological Institute of the Academy of Sciences (St. Petersburg).

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