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## **A Survey of *Meteorus* HALIDAY, 1835 of Turkey \*)** (Hymenoptera, Braconidae, Euphorinae)

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### **Abstract**

Seven species of *Meteorus* HALIDAY, 1835 from Turkey are determined. Four of these species are new to the fauna of Turkey. An illustrated key is provided for the species of *Meteorus* in Turkey. Distribution and known hosts are mentioned.

### **Zusammenfassung**

Sieben Arten der Gattung *Meteorus* HALIDAY, 1835 werden für die Türkei nachgewiesen, von denen vier Arten neu für die Fauna der Türkei sind. Ein Bestimmungsschlüssel für die in der Türkei vorkommenden *Meteorus*-Arten wird vorgeschlagen. Verbreitung und bekannte Wirte werden angegeben.

### **Introduction**

The taxonomy of the parasitic Hymenoptera is the least known of any group of insects and until recent years the Braconidae have received even less interest than most other Parasitica. Therefore, there is a great need for taxonomic work in most parts of the family. Many species of Braconidae use as hosts insects which are important economically as pests of crops. The need for programmed "biological" control is already becoming more urgent than the effectiveness of chemical methods of pest control declines. The use of parasitoid insects in the control of pest species has not met more than sporadic success. To

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be effective in biological control an intimate knowledge of the biology of the insects involved is essential, and this depends upon an accurate knowledge of their taxonomy.

Species of *Meteorus* HALIDAY, 1835 are primary parasites of the larvae of either Lepidoptera or Coleoptera. Most species of *Meteorus* are solitary parasitoids, but *M. heliophilus* FISCHER and *M. rubens* (NEES) are gregarious (LYLE 1914; TOBIAS 1976). The mature larvae of some species of the genus spin a cocoon suspended by a thread, and it is from this habit of which the name of the genus is derived. Among the exceptions to this are the gregarious species, which spin their cocoons together in loose heaps, and several species that parasitize wood-boring beetles, which form stalkless cocoons within the beetles' burrows. The species of *Meteorus* overwinter as eggs or as larvae within the body of the host or as mature larvae within the cocoon (LYLE 1914). Rearing data suggest that at least some species of *Meteorus* overwinter in different host species other than those they use for their summer generations.

To date, a total of 200 species of *Meteorus* have been reported in the world and approximately 50 species are found in the Palaearctic region (HUDDLESTON, 1980).

### Material and Methods

Adult specimens of *Meteorus* were collected from various habitats of Turkey between 1980 and 1999. Sweeping nets and light traps were used to obtain samples on grass-type plants. A part of specimens are obtained from larvae of Lepidoptera, which are pests of the crops. Collected samples were then pinned and labeled according to taxonomic rules and regulations. The specimens are deposited in the collection of the Zoological Museum of Department of Biology, Trakya University.

Relevant literature was used for taxonomical examination of materials. The specimens were identified mostly using the keys of HUDDLESTON (1980) and TOBIAS (1986).

The morphological terms used in this paper are defined in RICHARDS (1977). Length of ovipositor sheath defines the part extended beyond apex of metasoma in dorsal view.

The names of collecting places with grid numbers, collecting dates (as far as known) are listed for 7 species found in Turkey. The distribution of species is shown in fig. 1.

Although *M. obsoletus* WESMAEL has already been known from Turkey, we have not found it in our study, but we include it in this paper.

The following abbreviations are used in the text: OOL = ocular-ocellar line; POL = postocellar line; Noct. = Nocturnal; BMNH = British Museum of Natural History, London; IFF = Institut für Forstentomologie und Forstschutz, Vienna; IRSNB = Institut Royal des Sciences Naturelles de Belgique, Brussels; MZ = Museo Zoologia, Naples; NIAS = Plant Disease Herbarium and Insect Museum, National Institute of Agricultural Sciences, Yatabe; NHM = Naturhistorisches Museum, Vienna; NMV = National Museum of Victoria, Melbourne; NR = Naturhistoriska Riksmuseet, Stockholm; UDE = University Department of Entomology, Uppsala; USNM = U.S. National Museum of Natural History, Washington D.C.; ZI = Zoologiska Institution, Lund; ZSBS = Zoologische Sammlung des Bayerischen Staates, Munich.

The host records are an assemblage of the data given in previous papers (FISCHER 1957a, 1957b, 1957c, 1959a, 1959b, 1966, 1970a, 1970b; PAPP 1973; TOBIAS 1986).

Figures were drawn and measurements taken using a camera lucida attached to a

stereomicroscope.



Fig. 1 Distribution of *Meteorus*-species in Turkey. 1: *Meteorus politutele* SHENEF., 2: *M. versicolor* (WESM.), 3: *M. pulchricornis* (WESM.), 4: *M. rubens* (NEES), 5: *M. gyrator* THUNB., 6: *M. ictericus* (NEES), 7: *M. unicolor* (WESM.).

### Key to the *Meteorus* species of Turkey

- 1 Second metasomal tergite sculptured, 1st metasomal tergite in basal third with two deep pits (fig. 6). Head above up to occipital ridge and mesosoma, except smooth middle part of scutellum, with coarse and fairly dense punctation, weakly lustrous. Head behind eyes distinctly narrowed, temples somewhat shorter than eye. First metasomal tergite lacking pedicel, dorsal pits located anterior to its middle. Mesonotum in middle with longitudinal ridge. Body 7 - 8 mm ..... *M. politutele* SHENEFELT
- Second metasomal tergite smooth, 1st tergite lacking dorsal pits (fig. 11) or they are weakly developed and located usually in middle part of tergite ..... 2
- 2 First metasomal tergite lacking two longitudinal furrows (sometimes weak depressions present, differing little from depressions between longitudinal folds in middle of tergite (fig. 11) ..... 3
- First metasomal tergite with two distinct longitudinal furrows, closed anteriorly and open posteriorly at border between pedicel and broadened part of tergite (fig. 26) 7
- 3 Base of 1st metasomal tergite yellow or whitish, contrasting with darker broader part of tergite. Wings normally developed, recurrent vein antefurcal (fig. 8) or interstitial. Eyes and ocelli large. Antennae 29-33 segmented (fig. 7). Ovipositor 1.5 - 2.0 times as long as 1st metasomal tergite. Propodeum rugose-punctate. Color variable, usually body light colored. Body 3.5 - 5.5 mm ..... *M. versicolor* WESMAEL
- First metasomal tergite uniformly colored, usually dark, rarely basally lighter colored than in broader part, but not whitish and not contrasting light colored ..... 4
- 4 Stigma dark brown, basally or also anterior margin light colored. Clypeus densely punctate, matte, distinctly bulged, with dense light colored erect hairs. Face slightly less high than wide, head distinctly narrowed behind eyes, ocelli large. Claw with

- basal prominence. Ovipositor slightly shorter than metasoma. Sternauli broad, rugose; propodeum coarsely rugose. Body light colored (cf. also couplet 10 -) ..... *M. pulchricornis* WESMAEL
- Stigma yellow ..... 5
- 5 Antennae setiform, usually longer than body, 28-34 segmented (fig. 7). Propodeum uniformly reticulate-rugose. Claw with basal prominence. Recurrent vein somewhat interstitial (fig. 8). Margins of 1st metasomal tergite contiguous over longer distance below (cf. also couplet 3) ..... *M. versicolor* WESMAEL
- Antennae filiform, not as long as body, 24-28 segmented (fig. 16) (in male setiform, but usually not more than 28 segmented) ..... 6
- 6 Temples slightly shorter than eye. Recurrent vein interstitial or almost interstitial (fig. 18). Face 2 times as wide as high. Ocelli large, distance between posterior ocellus and eye approximately 1.5 times ocellar diameter. Propodeum rugose. Ovipositor 2 times as long as 1st metasomal tergite. Color of body distinctly variable: from entirely dark brownish yellow to black. Body 3.5 - 6.0 mm ..... *M. rubens* NEES
- Temples much shorter than transverse diameter of eye. Recurrent vein postfurcal. Claw with basal prominence. Ovipositor valves much shorter than metasoma. Head behind eyes distinctly roundly narrowed, temples one-third as long as eye. Mesosoma black, pronotum and metasoma except first tergite dark brown or yellow; legs yellow. Body 4-5 mm. Parasitoid of *Tortrix viridana* L., *Gypsonoma dealbana* FRÖL., *Rhopobota ustomaculana* CURT. (Tortricidae). Moldavia, Western Europe, Turkey . . . . *M. obsoletus* WESMAEL
- 7 Recurrent vein falling in 2nd radiomedial cell or interstitial (fig. 23). Face with clypeus at most slightly higher than wide. Distance between posterior ocelli 1.5 times ocellar diameter. Propodeum with somewhat distinct longitudinal ridge against uniformly rugose background, lacking pentangular areola in middle. Body light colored; 1st metasomal tergite and often upper part of mesosoma somewhat dark. Body 4-6 mm ..... *M. gyrator* THUNBERG
- Recurrent vein antefurcal (fig. 28), sometimes almost interstitial ..... 8
- 8 Stigma yellow, sometimes slightly dark brownish, transparent ..... 9
- Stigma dark brown, with light colored spot at base, sometimes light colored on anterior margin ..... 10
- 9 Ovipositor valves as long as metasoma or slightly longer. Antennae filiform, 26-33-segmented (fig. 27). Recurrent vein usually greatly shifted from 1st radiomedial vein (fig. 28). Claw with basal prominence. Color variable. Body 4-6 mm (cf. also couplets 10) ..... *M. ictericus* NEES
- Ovipositor valves much shorter than metasoma. Antennae setiform (fig. 32). Recurrent vein almost interstitial (fig. 33). Sternauli wide, rugose (like upper part of mesothorax). Notauli fairly wide, rugose. Propodeum coarsely reticulate-rugose, with depression in middle, with ridge above. Face half as high as wide. Hindwing 0.64 times as long as fore wing. Body dark brownish yellow, 4-5 mm . *M. unicolor* WESMAEL
- 10 Propodeum above with smooth sculpture. Frons smooth. Antennal segments in apical half longer than wide. Face almost as high as wide. Ocelli large, diameter of posterior ocellus equal ocellocular distance or about 2/3 of it. Claws distinctly curved with large basal prominence. Eyes large, protuberant. Antennae 26-33 segmented. Ovipositor

2.5 to 3 times as long as 1st metasomal tergite. First metasomal tergite longitudinally rugose. Hindwing 0.80 times as long as fore wing. Color variable; often body dark colored, while head, pronotum and legs are dark brownish yellow. (cf. also couplet 9)

..... *M. ictericus* NEES

- Propodeum entirely rugose; if above with smooth sculpture, then very short and frons punctate. Apical antennal segments as long as wide or slightly shorter. Height of face much less than its width. Face almost as high as wide. Clypeus densely punctate, matte, with dense erect hairs, distinctly and uniformly bulged. Claws lacking basal prominence (cf. also couplets 4) ..... *M. pulchricornis* WESMAEL

### *Meteorus politutele* SHENEFELT, 1969 (figs 2-6)

*Meteorus politus* TELENGA, 1950: 295, Lectotype designated by TOBIAS 1986, USSR, Uzbekistan, Guzar, V.1929 (ZI St.Petersburg).

*Meteorus politutele* SHENEFELT, 1969: 86, new name for *M. politus* TELENGA, 1950, not PROVANCHER, 1886 (TOBIAS 1986: 184).

Distribution: USSR, Uzbekistan, Guzar.

Hosts: Unknown.

Description. ♂: Length of body 4.2 mm, of fore wing 3.4 mm, of mesosoma 1.2 mm, of metasoma 1.9 mm, of ovipositor sheath 1.0 mm.

Antennae 30-segmented, long, slender; all flagellar segments distinctly longer than broad (fig. 2). Head contracted behind eyes distinctly narrowed, temples somewhat shorter than eye in dorsal view; face half as high as wide. Ocelli large,  $OO = 1.1$  times  $OD$ . Eyes large, protuberant, moderately convergent. Malar space slightly shorter than basal breadth of mandible (3:4). Face not strongly protuberant and punctate. Clypeus strongly protuberant, evenly convex, finely and densely rugose-punctate with dense short hairs. Mandibles small, delicate and strongly twisted. Pronotum laterally reticulate-rugose. Mesonotum in middle with longitudinal ridge. Notauli foveolate, broadened and rugose anteriorly, coalescing posteriorly into a reticulate-rugose area. Sternaulus rugose, often becoming reticulate-rugose anteriorly but never broadened. Rest of mesopleuron polished, punctate except dorsally where it is reticulate-rugose.

Wings: Fore wing 0.8 times as long as length of body,  $r$  0.4 times as long as 3-SR,  $m-cu$  slightly postfurcal,  $cu-a$  inclivous (fig. 3). Hind wing 0.85 times as long as fore wing,  $1+M : 1r-m : 2-SC+R : SC+R1 = 6 : 11 : 5 : 20$  (fig. 4).

Legs: Long, thin; hind coxa rugose (fig. 5).

Propodeum strongly reticulate-rugose, without distinct carinae.

Tergite one 1.8 times as long as wide at apex, longitudinally striate, dorsal pits located anterior of middle, laterally with a few rugae but never with glymmae, second metasomal tergite delicately longitudinally striate (fig. 6). Ovipositor 0.23 times length of metasoma.

Colour yellow except for the notauli, the sternaui, the subalar area of the mesopleurae, the propodeum and tergite one which are reddish brown; the tip of the gaster is often darkened and sometimes the preceding tergites.

Variations: Orijinal örnek 7-8 mm oldugu halde bizim örnek 4.2 mm.

Material examined: Samsun-Mercimek, 40°46'60N/36°16'0E, 29.6.1993, 1. Yalova-Safran Deresi, 40°36'0N/29°10'60E, 11.9.2001, ♂. New for Turkey!

*Meteorus versicolor* (WESMAEL, 1835) (figs 7-11)

*Perilitus versicolor* WESMAEL, 1835: 43, Lectotype, Belgium: Charleroy (IRSNB), designated by MARSH 1979 (examined).

*Perilitus bimaculatus* WESMAEL, 1835: 45, Lectotype, Belgium: Charleroy (IRSNB), designated by MARSH 1979 (examined), synonymized by MUESEBECK 1923: 36.

*Perilitus unicolor* HARTIG, 1838: 254, Lectotype, Germany (ZSBS), here designated (examined), junior primary homonym of *unicolor* WESMAEL, 1835 (see *hartigi*).

*Perilitus brevicornis* RATZBURG, 1844: 77, Holotype, Germany: RATZBURG collection (Ip, Eberswalde) (examined), synonymized by KÖNIGSMANN 1964: 654.

*Perilitus rugator* RATZBURG 1852: 59, Lectotype, Germany: "741/ neust Br./ *Peril. rugator* ant 30 art" RATZBURG collection (Ip, Eberswalde), here designated (examined), synonymized by HUDDLESTON 1980.

*Meteorus decoloratus* RUTHE, 1862: 48, Lectotype, Germany: RUTHE coll. (BMNH), here designated (examined), synonymized by MUESEBECK 1923: 36.

*Meteorus camptolomae* WATANABE, 1939: 25, Holotype, Japan: "Okikuba, Tokyo" (EI, Sapporo) (not examined), synonymized by HUDDLESTON 1980.

*Meteorus ikonovici* FISCHER, 1959: 5, Holotype, Yugoslavia: Dalmatien, Gravosa (NHM) (examined), synonymized by HUDDLESTON 1980.

*Meteorus hartigi* SHENEFELT 1969: 69, replacement name for *unicolor* HARTIG, 1838, synonymized by HUDDLESTON 1980.

*Meteorus versicolor*: HUDDLESTON 1980.

Distribution: Austria, Bulgaria, France, Germany, Great Britain, Hungary, Ireland, Japan, Mongolia, Netherlands, Palestine, Poland, Sweden.

Hosts: *Dendrolimus pini* L., *Eriogaster lanestris* L., *Lasicampa quercus* L., *Macrothylacia rubi* L., *Malacosoma neustria* L. (Lepidoptera: Lasiocampidae); *Arctornis l-nigrum* MÜL L., *Dasychira pudibunda* L., *Euproctis flava* BREM., *Euproctis chrysorrhoea* L., *Leucoma salicis* L., *Lymantria dispar* L., *L. monacha* L., *Orgyia antiqua* L., *O. ericae* GERM., *Ocnaria detrita* ESP. (Lep.: Lymantriidae); *Agrotis segetum* DEN. & SCHIFF., *A. strigula* THUNB., *A. exclamatoris* L., *Amathes agathina* DUP., *Anarta myrtili* L., *Brachionycha sphinx* HFN., *Diachrysis chrysitis* L., *Lycophotia porphyrea* DEN. & SCHIFF., *Noctua pronuba* L., *Nycteola asiatica* KRUL., *Panolis flammea* DEN. & SCHIFF. (Lep.: Noctuidae); *Archiearis parthenias* L., *Calospilos pantaria* L., *Ematurga atomaria* L., *Ennomos erosaria* DEN. & SCHIFF., *Eulithis testata* L., *Eupithecia exigua* HB., *Geometra papilionaria* L., *Operophtera brumata* L. (Lep.: Geometridae); *Maniola jurtina* L. (Lep.: Satyridae); *Thaumetopoea processionea* L., *T. pictocampa* DEN. & SCHIFF. (Lep.: Thaumetopoeidae); *Archips oporana* L., *Pandemis cerasana* HB. (Lep.: Tortricidae); *Nola cucullatella* L. (Lep.: Nolidae); *Hyphantria cunea* DRURY (Lep.: Arctiidae); *Argyresthia nitidella* F. (Lep.: Argyresthiidae); *Eurrhpara hortulata* L. (Lep.: Pyraustidae).

Description. ♀: Length of body 4.6 mm, of fore wing 3.9 mm, of mesosoma 1.3 mm, of metasoma 1.5 mm, of ovipositor sheath 1.0 mm.

Antennae 29- to 33-segmented; flagellum thick basally, tapering to apex, all segments of flagellum distinctly longer than broad, mostly more than twice as long as broad (fig. 7). Head broad, more or less strongly contracted behind eyes, eyes in dorsal view 2.5-3.0 times length of temple. Ocelli large, OO = OD, protuberant. Eyes large, protuberant, only

slightly convergent. Malar space short, always less than the basal breadth of mandible. Face about 1.5 times as broad as high, not strongly protuberant but somewhat raised medially, generally with transverse rugose sculpture, at least on the raised medial part, occasionally smooth, punctate. Clypeus protuberant. Mandibles small, delicate, strongly twisted. Pronotum not projecting before the mesonotum, laterally rugose, sometimes reticulate-rugose. Propleurae rugose-punctate. Notauli shallow, anteriorly broadened and reticulate-rugose, posteriorly coalescing into a broad rugose area; rest of mesonotum punctate, often reticulate-punctate medially. Sternaulus a broad rather shallow furrow weakly rugose and foveolate, generally broader and sometimes reticulate-foveolate medially, often obsolescent anteriorly and posteriorly; rest of mesopleurae polished and with minute punctures; much of the sculpture of the sternaulus is so weak that it is invisible except under most oblique light.

Wings: Forewing 0.85 times as long as length of body,  $r$  0.43 times as long as 3-SR,  $m$ -cu almost interstitial or antefurcal, cu-a inclivous (fig. 8). Hindwing 0.77 times as long as forewing,  $1+M : 1r-m : 2-SC+R : SC+R1 = 9 : 11 : 4 : 29$  (fig. 9).

Legs: Stout, hind coxa smooth, punctate, sometimes with weak transverse rugae dorsally. Tarsal claws strongly curved with a pronounced basal lobe (fig. 10).

Propodeum short, broad, strongly rugose, often reticulate-rugose with no distinct carinae but with a distinct medial impression posteriorly.

Tergite one long, rather slender at base with no dorsal pits, its ventral borders conjoined from shortly before the midpoint of the segment to its base, dorsal surface finely striate, lateral and ventral conjoined parts smooth (fig. 11). Ovipositor short, 0.58 times length of body, thick, strongly tapered shortly before apex.

Colour varies from almost completely testaceous to almost completely brown; specimens occur fairly commonly in which the propodeum, tergite one except at base, hind coxa, thorax in part and head in part are black, the rest of the body and legs testaceous; sometimes the normally testaceous parts of the body are much paler yellow, almost ivory. The base of tergite one generally pale yellow.

♂: Same as ♀ except that eyes are generally smaller and less protuberant. I have examined one male specimen which is completely brownish black.

Material examined: Adana-Balcali, 37°02'52N/35°21'09E, 29.5.1996, 1. Afyon-Sincanlı-Akören, 38°46'60N/30°22'60E, 26.7.1997, 1. Aydın-Adnan Menderes Ü. Ziraat Fak., 38°0'0N/28°0'0E, 18.9.1996, 2; Ziraat Fakültesi Kampüsü, 38°0'0N/28°0'0E, 18.5.1996, 2. Muğla-Dipsiz-Yatagan, 37°19'60N/28°8'60E, 18.9.1996, 1. Tekirdağ-İsıklar, 40°50'59N/27°20'34E, 9.9.1999, 1. Van Üniv. Kampüsü, 38°30'0N/43°22'60E, 22.7.1990, 1. Sanliurfa-Fatmaköyü, 38°12'0N/36°22'0E, 28.5.1998, 1. **New for Turkey!**

### *Meteorus pulchricornis* (WESMAEL, 1835) (figs 12-16)

*Perilitus pulchricornis* WESMAEL, 1835: 42, Lectotype ♀, Belgium: Brussels, coll. WESMAEL (IRSNB), designated by MARSH 1979 (examined).

*Meteorus striatus* THOMSON, 1895: 2157, Lectotype ♀, Sweden: Skane, Palsjö (ZI), here designated (examined), synonymized by HUDDLESTON 1980.

*Meteorus thomsoni* MARSHALL, 1899: 301, unnecessary replacement name for *pulchricornis* WESMAEL sensu THOMSON.

- Meteorus japonicus* ASHMEAD, 1906: 190, Lectotype ♀, Japan: Gifu, viii.1902 (USNM), designated and synonymized by MARSH 1979 (not examined).  
*Meteorus nipponensis* VIERECK, 1912: 624, Holotype ♀, Japan (USNM) (not examined), synonymized with *japonicus* by WATANABE 1939.  
*Meteorus macedonicus* FISCHER, 1957a: 104, Holotype ♀, Yugoslavia: Macedonia, Treskaschlucht (NHM) (examined), synonymized by HUDDLESTON 1980.  
*Meteorus graeffei* FISCHER, 1957a: 107, Holotype ♂, Italy: "Triest" (NHM) (not examined), synonymized with *macedonicus* by FISCHER 1970b: 287.  
*Meteorus tuberculifer* FISCHER, 1957a: 108, Holotype ♀, Italy: Trieste Küstenland, coll. GRAEFFE (NHM) (examined), synonymized by HUDDLESTON 1980.  
*Meteorus pulchricornis*: HUDDLESTON 1980.

Distribution: Caucasus, Central and South USSR, Cyprus, France, Germany, Great Britain, Hungary, Ireland, Japan, Netherlands, Poland, Portugal, Spain, Sweden, Switzerland, Turkey.

Hosts: *Lycophotia porphyrea* DEN. & SCHIFF., *Eupsilia transversa* HFN. (Lepidoptera: Noctuidae); *Lymantria dispar* L. (Lep.: Lymantriidae); *Agriopsis aurantiaria* HBN., *A. leucophaearia* DEN. & SCHIFF., *Eupithecia nanata* HBN., *Operophtera brumata* L. (Lep.: Geometridae); *Thecla betulae* L. (Lep.: Lycaenidae); *Nola cucullatella* L. (Lep.: Nolidae); *Poecilocampa populi* L. (Lep.: Lasiocampidae); *Charaxes jasius jasius* L. (Lep.: Nymphalidae); *Hyphantria cunea* DRURY (Lep.: Arctiidae).

Many other hosts of *M. pulchricornis* have been recorded in the literature, some of them are of considerable economic importance (MARSH 1979). The species is evidently catholic in its choice of hosts, attacking caterpillars of species from diverse groups of Lepidoptera.

Description. ♀: Length of body 3.5 mm, of fore wing 3.5 mm, of mesosoma 1.6 mm, of metasoma 1.9 mm, of ovipositor sheath 1.3 mm.

Antennae 29- to 33-segmented, long, slender; all flagellar segments distinctly longer than broad (fig. 12). Head contracted behind eyes, length of eye about twice length of temple in dorsal view. Ocelli large, OO = 1.4 times OD. Eyes large, protuberant, moderately convergent. Malar space slightly shorter than basal breadth of mandible. Face not strongly protuberant but slightly raised medially, the raised area finely transversely rugose, rest of face smooth, punctate. Clypeus strongly protuberant, evenly convex, finely and densely rugose-punctate with a dense pile of erect hairs. Mandibles small, delicate and strongly twisted. Pronotum laterally rugose. Notauli foveolate, broadened and rugose anteriorly, coalescing posteriorly into a reticulate-rugose area. Scutellum smooth dorsally and rugose laterally. Sternaulus rugose, often becoming reticulate-rugose anteriorly but never broadened. Rest of mesopleuron polished, punctate except dorsally where it is reticulate-rugose.

Wings: Forewing 0.87 times as long as length of body, r 0.33 times as long as 3-SR, mcu interstitial, cu-a inclivous (fig. 13). Hindwing 0.8 times as long as forewing, 1+M : 1r-m : 2-SC+R : SC+R1 = 9 : 11 : 3 : 25 (fig. 14).

Legs: long, slender; hind coxa generally completely rugose, this sculpture always fine, never reticulate though sometimes transverse (fig. 15). Tarsal claws with a basal lobe.

Propodeum strongly reticulate-rugose, without distinct carinae.

First metasomal tergite longitudinally striate, with distinct pedicel, above lacking fur-



rows or furrows weak and located generally in middle.

Tergite one smooth laterally, sometimes with a few rugae but never with glymmae (fig. 16). Ovipositor 1.5 times length of tergite one and 0.58 times as long as length of metasoma. Body 4.5 mm.

Colour yellow except notauli, the sternauli, the subalar area of mesopleurae, propodeum and tergite one which are reddish brown; the tip of the gaster is often darkened and sometimes the preceding tergites. Completely pale specimens occasionally occur.

♂: Same as ♀, except antennae slightly longer; face occasionally strongly raised medially; propodeum smaller, more depressed and with greater variation in sculpture.

Material examined: Kirklareli-Dereköy-Çaglayan, 41°55'60N/27°21'0E, 4.6.1993, 1, 3. Kofçaz-Ahlatli, 42°4'60N/27°11'60E, 4.6.1993, 1. Mugla-Kizilyaka, 36°22'0E/ 28°22'20E, 25.6.1998, 1.

### *Meteorus rubens* (NEES VON ESENBECK, 1811) (figs 17-21)

*Bracon rubens* NEES VON ESENBECK, 1811: 22, Syntypes ♀, Germany (lost).

*Perilitus leviventris* WESMAEL, 1835: 46, Lectotype ♀, Belgium: Brussels, coll. WESMAEL (IRSNB), here designated (examined), synonymized by FISCHER 1970b: 260.

*Meteorus islandicus* RUTHE, 1859: 317, Syntypes, Iceland: STAUDINGER coll. (NHM) (examined), synonymized by ROMAN 1917: 4.

*Meteorus medianus* RUTHE, 1862: 53, Lectotype ♀, Germany: RUTHE coll. (BMNH), here designated (examined), synonymized with *leviventris* by MARSHALL 1887: 126.

*Meteorus scutatus* Costa, 1884: 172, Holotype ♀, Italy: Oristano (MZ) (examined), synonymized by HUDDLESTON 1980.

*Meteorus heteroneurus* THOMSON, 1895: 2158, Holotype ♀, Sweden: Vestergothland (ZI) (examined), synonymized by FISCHER 1970b: 260.

*Meteorus szechuanensis* FAHRINGER, 1935: 11, Lectotype ♀, China: NO Szechuan (NR), here designated (examined), synonymized by HUDDLESTON 1980.

*Meteorus mesopotamicus* FISCHER, 1957a: 105, Holotype ♀, Iraq: Mosul (NHM) (examined), synonymized by HUDDLESTON 1980.

*Meteorus rubens*: HUDDLESTON 1980.

Distribution: Algeria, Bulgaria, Cyprus, Denmark, Egypt, France, Germany, Great Britain, Hungary, Iceland, Ireland, Israel, Japan, Mongolia, Palestine, Sweden, Turkey.

Hosts: *Agrotis exclamantionis* L., *A. obesa* BOISD., *A. vestigialis* HFN., *A. ypsilon* HNF., *Amathes c-nigrum* L., *Cerapteryx graminis* L., *Discestra trifolii* HFN., *Mamestra brassicae* L., *Noctua pronuba* L., *Ochropleura fennica* TAUSCH., *Peridroma saucia* HB., *Spodoptera exigua* HBN. (Lepidoptera: Noctuidae); *Cynthia cardui* L. (Lep.: Nymphalidae); *Idaea muricata* HFN., *Stierha muricata* HFN. (Lep.: Geometridae); *Phthorimaea operculella* Z. (Lep.: Gelechiidae); *Tortrix viridana* L., *Eupoecilia ambiguella* HB., *Lobesia botrana* DEN. & SCHIFF. (Lep.: Tortricidae); *Orgyia antiqua* L. (Lep.: Lymantriidae).

MUESEBECK (1923) pointed out that *rubens* (as *vulgaris* CRESSON) is "an important parasite of the cutworm type of Noctuid larva".

Description. ♀: Length of body 3.5 mm, of forewing 3.3 mm, of mesosoma 1.3 mm, of metasoma 1.6 mm, of ovipositor sheath 0.9 mm.

Antennae short, 24- to 28-segmented; the segments in distal half of the flagellum often

only as long as broad but sometimes longer than this (fig. 17). Head behind the eyes straight for a short distance, then strongly contracted, temples slightly shorter than eye. Ocelli large,  $OO = 1.0 - 1.5$  times  $OD$ . Eyes only slightly convergent. Malar space slightly less than basal breadth of mandible. Face a little less than twice as wide as high, protuberant with a medial longitudinal raised area which is finely transversely rugose, in more heavily sculptured specimens the rugosity extends onto the lateral areas of the face which are normally smooth, punctate. Clypeus protuberant, transverse, medially reticulate-punctate, laterally finely transversely rugose. Tentorial pits large, distinct. Mandibles long, moderately twisted, the upper tooth generally rather long. Pronotum laterally rugose. Mesonotum densely punctate, the punctures large and often forming a reticulate pattern, especially on the central lobe of the mesonotum. Notauli short, foveolate, broadened anteriorly and posteriorly, coalescing into a reticulate-rugose area. Sternaulus a shallow rugose furrow; rest of mesopleuron smooth, punctate.

Wings: Forewing 0.95 times as long as length of body,  $r$  0.75 times as long as 3-SR,  $m-cu$  interstitial or almost interstitial,  $cu-a$  inclivous (fig. 18). Hindwing 0.8 times as long as forewing,  $1+M : 1r-m : 2-SC+R : SC+R1 = 10 : 14 : 4 : 25$  (fig. 19).

Legs: Hind coxa smooth, punctate, sometimes with weak rugosity dorsally at the base. Tarsal claws never strongly bent and usually only swollen at the base but sometimes the swollen base is demarcated as a lobe and occasionally this lobe is dentate, particularly on the claws of the forelegs (fig. 20).

Propodeum rugose and generally with only a medial longitudinal carina distinct though sometimes, in less heavily sculptured specimens, the basal and medial transverse carinae can be differentiated from the rugae.

Tergite one generally smooth at the base and with obsolescent striae distally, occasionally almost completely smooth (fig. 21). Ventral borders of tergite one conjoined in the middle part of the segment; there is some variation in the extent of this conjunction but it never extends to the base of the segment. Ovipositor 0.6 times as long as length of body, thick, strongly swollen at the base and strongly narrowed in apical sixth.

Colour varies from completely black to completely yellow with all intermediate stages represented, none of which is completely characteristic of the species.

♂: Same as ♀ except antennae longer, 26- to 30-segmented, all flagellar segments distinctly longer than broad; the propodeum is more depressed, often less strongly rugose and with the carinae more distinct.

Material examined: Adana-Camili, 36°42'0N/33°42'0E, 16.5.1995, 4, 1. Köprüköy, 37°1'0N/35°17'60E, 4.6.1979, 1, 1. Adapazari-Akyazi-Dedeler, 40°31'0N/31°19'60E, 22.9.1992, 1. Geyve-Bağlarbaşı, 40°30'0N/30°18'0E, 21.9.1992, 1. Afyon-Dinar-Kazanpınar, 38°05'51N/30°11'29E, 28.6.1998, 5. Evciler-Körkuyu, 38°0'0N/30°1'0E, 28.6.1998, 1. Sincanlı-Akören, 38°46'60N/30°22'60E, 26.7.1997, 1. Agri-Eleskirt, 39°51'0N/42°49'0E, 24.6.1990, 1. Ankara-Çubuk-Sarıkoz Koruğu, 39°55'60N/32°52'0E, 14.6.1990, 1. Bolu-Aladag-Kokez, 40°25'60N/31°51'0E, 27.8.2002, 5. Bursa-Karacabey-Devlet Üretim Çiftliği, 40°13'0N/28°21'0E, 19.8.1994, 5. Çanakkale-Eceabat-Berhamli, 40°10'60N/26°21'0E, 8.6.2001, 2. Eceabat-Kabatepe, 40°10'60N/26°21'0E, 8.6.2001, 1. Göçada-Uğurlu Köyü, 40°16'60N/25°25'0E, 7.7.1996, 1; 18.9.1998, 1, 1. Çorum-Kargı, 40°32'60N/34°58'0E, 31.8.2002, 1. Denizli-Çardak, 37°46'0N/29°6'0E, 28.6.1998, 4. Tavas-Tekkeköy, 37°54'0N/28°46'0E, 27.6.1998, 1. Edirne-Binevler, 41°40'0N/ 26°34'

0E, 9.6.1991, 1, 1 (Noct.). Hacımur, 41°43'0N/26°48'0E, 27.6.1991, 6 (Noct.); 27.6.1991, 8, 6. Havs-a-Abalar, 41°33'0N/26°45'0E, 1.8.1992, 5, 7. Havs-a-Necatiye, 41°30'0N/26°53'60E, 30.8.1992, 2. Kesan-Korudag, 40°42'0N/26°45'0E, 10.9.1999, 19 (Noct.). Lalapasa-Hacidanisment, 41°53'60N/26°48'0E, 5.7.1997, 1. Suakacagi, 41°50'27N/26°35'28E, 5.7.1997, 2, 12. Trakya Üniv. Güllapoglu Yerleskesi, 41°40'0N/26°34'0E, 22.10.1999, 9, 1 (Noct.); 8.6.2001, 8; 2.6.1991, 1. Uzunköprü-Balaban, 41°4'60N/26°33'0E, 30.7.1992, 1. Gullapoglu, 41°40'0N/26°34'0E, 3.10.2001, 1 (Noct.). Gümüshane-Kelkit, 40°7'60N/39°27'0E, 29.7.1991, 1. İçel-Tarsus, 36°55'0N/34°52'60E, 16.5.1995, 1, 1. Izmir-Karaburun-Baliklioia, 38°23'60N/26°34'60E, 23.6.1998, 1, 1. Oglan-nasi, 38°13'60N/27°13'60E, 24.6.1998, 5. Kahramanmaras-Göksun, 38°2'60N/36°30'0E, 25.7.1980, 1. Kastamonu, Ilgazdagi-Çamören, 41°15'0N/34°15'0E, 3.7.2001, 1. Kirkla-reli-Yeniceköy, 41°43'60N/27°37'60E, 6.9.1988, 2, 1. Manisa-Turgutlu, 38°30'0N/27°43'0E, 30.6.1998, 4. Mugla-Dalaman, 37°46'60N/28°4'0E, 25.6.1998, 1. Gökova-Kemertur, 37°1'0N/28°22'0E, 26.6.1998, 1. Marmaris-Degirmenyanı, 36°51'0N/28°16'0E, 26.6.1998, 1. Sanliurfa-Fatmaköyü, 38°12'0N/36°22'0E, 28.5.1998, 2, 2. Sinop-Demirci, 41°13'60N/36°16'0E, 3.7.2001, 1. Tekirdag-Naipköy, 40°52'0N/27°25'0E, 7.9.1999, 1. Saray, 41°27'35N/27°56'24E, 25.8.1992, 1. Van, 38°30'0N/43°22'60E, 10.7.1998, 1. Gürpınar, 38°19'0N/43°25'0E, 28.7.1990, 1. Üniv. Kampüsü, 38°30'0N/43°22'60E, 22.6.1990, 1.

***Meteorus gyrator* (THUNBERG, 1822) (figs 22-26)**

*Ichneumon gyrator* THUNBERG, 1822: 261, Holotype, Sweden (UDE) (examined).

*Perilitus scutellator* NEES VON ESENBECK, 1834: 38, Syntypes, Germany (lost), synonymized by ROMAN 1912: 289.

[*Meteorus melanostictus* CAPRON in MARSHALL, 1887: 115, only ♂♂ from type-series].

*Meteorus parvulus* THOMSON, 1895: 2156, Holotype, Sweden: Öland (ZI) (examined), synonymized by HUDDLESTON 1980.

*Meteorus gyrator*: HUDDLESTON 1980.

Distribution: Austria, Bulgaria, Cyprus, Finland, France, Germany, Great Britain, Hungary, Ireland, Netherlands, Sweden.

Hosts: *Amathes triangulum* HFN., *A. xanthographa* DEN. & SCHIFF., *Agrochola lota* CLERCK, *Amphipyra tragoponis* CLERCK, *Chilodes maritima* TAUSCH., *Cleoceris viminalis* FABR., *Cosmia trapezina* L., *Cucullia argenta* HFN., *Diarsia brunnea* DEN. & SCHIFF., *E. temera* HB., *Euplexia lucipara* L., *Eupsilia transversa* HFN., *Euxoa nigricans* L., *Hydraecia micacea* ESP., *Ipimorpha retusa* L., *I. subitosa* DEN. & SCHIFF., *Lacanobia oleracea* L., *Lycophotia porphyrea* DEN. & SCHIFF., *Mythimna unipuncta* HW., *Noctua fimbriata* SCHREB., *N. pronuba* L., *Nycteola asiatica* KRUL., *Orthosia stabilis* DEN. & SCHIFF., *Panolis flammea* DEN. & SCHIFF., *Spodoptera exigua* HB., *Thalpopophila matura* HFN. (Lepidoptera: Noctuidae); *Agriopis aurantiaria* DEN. & SCHIFF., *Calospilos pantaria* L., *Eupithecia vulgaris* HAW., *E. exigua* HB., *Operophtera brumata* L., *Thera juniperata* L. (Lep.: Geometridae); *Lymantria dispar* L., *L. monacha* L., *Leucoma salicis* L., *Orgyia gonostigma* F. (Lep.: Lymantriidae); *Malacosoma neustria* L., *Odonestis pruni* L. (Lep.: Lasiocampidae); *Choristoneura murinana* HB., *Tortrix viridina* L. (Lep.: Tortricidae); *Strymon w-album* KNOCH. (Lep.: Lycaenidae).

Description. ♀: Length of body 4.7 mm, of forewing 3.7 mm, of mesosoma 1.6 mm, of metasoma 2.1 mm and of ovipositor sheath 1.2 mm.

Antennae long, setiform, 32-segmented, at most the two penultimate segments of the flagellum less than twice as long as broad (fig. 22). Head always contracted behind eyes, occasionally strongly rounded; temple always at least a little shorter than eye in dorsal view, eye never more than twice as long as temple. Frons with a short, shallow depression in front of fore ocellus. Ocelli large,  $OO = 1.0 - 1.5$  times  $OD$  (exceptionally  $OO = 2$  times  $OD$ ). Eyes large, protuberant, generally but little convergent. Malar space a little less than basal breadth of mandible. Face generally a little broader than high, moderately protuberant, densely punctate, even reticulate-punctate, sometimes with some rugosity medially. Clypeus strongly protuberant, densely punctate, divided by a deep fold of the face. Mandibles long, strongly twisted. Pronotum projecting a little in front of the mesonotum, laterally rugose though this is occasionally largely obsolescent. Notauli anteriorly broad, reticulate-rugose, coalescing posteriorly into a broad reticulate-rugose area which is rather depressed below the level of the lateral lobes of the mesonotum; rest of mesonotum polished, densely punctate, sometimes with a weak rugulose element, particularly on lateral lobes. Sternaulus narrow, foveolate, occasionally roadened anteriorly by reticulate-foveolate patch beneath and, occasionally, with some rugae; rest of mesopleurae smooth with minute punctures except for a rugose area beneath the subalar prominence.

Wings: Forewing 0.85 times as long as length of body,  $r$  0.4 times 3-SR, m-cu (recurrent vein) antefurcal; cu-a inclivous (fig. 23). Hindwing 0.77 times as long as forewing,  $1+M : 1r-m : 2-SC+R : SC+RI = 10 : 15 : 2 : 13$  (fig. 24).

Legs: Long, thin; hind coxa smooth (fig. 25), with a weak trace; tarsal claws always with a basal lobe but this is often difficult to see because the claws are rather small and often partly buried in the hairs of the apical segment, punctate, often with a trace of weak rugosity laterally, occasionally with stronger rugosity dorsally, but never strongly reticulate-rugose.

Propodeum broad, generally rather flat, densely but finely rugose, sometimes reticulate-rugose with a central longitudinal carina which is sometimes weak and occasionally broken but always present, at least in part; the rugosity is occasionally coarse but is then sparse and not reticulate.

Tergite one with distinct dorsal pits; dorsal surface strongly striate; lateral surface rugose at base, striate apically; glymmae shallow (fig. 26). Ovipositor short, 1.5 - 2.0 times length of tergite one, thick, strongly swollen at base.

Colour black; face, clypeus, genae anteriorly, vertex laterally, thorax ventrally, scutellum and tergites 2 and 3 orange-testaceous, legs yellow; wings hyaline, the pterostigma always uniformly pale testaceous.

Mat. examined: Adana-Balcali, 37°02'52N/35°21'9E, 2.5.1983, 2. **New for Turkey!**

### *Meteorus ictericus* (NEES VON ESENBECK, 1811) (figs 27-31)

*Bracon ictericus* NEES VON ESENBECK, 1811: 22, Syntype(s) ♀, Germany (destroyed).

*Ichneumon minor* THUNBERG, 1822: 266, Holotype ♀ (UDE) (examined), synonymized by ROMAN 1912: 267.

*Zelee ephippium* CURTIS, 1832: folio 415, Syntypes, Great Britain: Coomb Wood (NMV)

(not examined), synonymized by CURTIS 1837.

*Perilitus xanthomelas* WESMAEL, 1835: 29, Lectotype ♂, Belgium: Brussels (IRSNB), here designated (examined), synonymized by FISCHER 1970b: 263.

*Meteorus confinis* RUTHE, 1862: 18, Lectotype ♀, Germany: RUTHE coll. (BMNH), here designated (examined), synonymized by HUDDLESTON 1980.

*Meteorus fallax* RUTHE, 1862: 18, Lectotype ♀, Germany: RUTHE coll. (BMNH), here designated (examined), synonymized by HUDDLESTON 1980.

*Meteorus pleuralis* RUTHE, 1862: 19, Lectotype ♀, Germany: RUTHE coll. (BMNH), here designated (examined), synonymized by HUDDLESTON 1980.

*Meteorus liquis* RUTHE, 1862: 20, Lectotype ♀, Germany: RUTHE coll. (BMNH), here designated (examined), synonymized by HUDDLESTON 1980.

*Meteorus consors* RUTHE, 1862: 44, Lectotype ♀, Germany: RUTHE coll. (BMNH), here designated (examined), synonymized by FISCHER 1970b: 263.

*Meteorus crassicus* THOMSON, 1895: 2154, Lectotype ♀, Sweden: Skilne, Arrie (ZI), here designated (examined), synonymized by HUDDLESTON 1980.

*Meteorus lophyrphagus* FAHRINGER in SCHONWIESE, 1934: 495, Holotype ♀, Austria (IFF) (examined), synonymized by HUDDLESTON 1980.

*Meteorus adoxophyesi* MINAMIKAWA, 1954: 41, Holotype ♀, Japan: Kanaya Shizuoka-ken, 10.iv.1948 (Sonan) (Nias) (examined), synonymized by HUDDLESTON 1980.

*Meteorus ictericus*: HUDDLESTON 1980.

Distribution: Austria, Czechoslovakia, Finland, France, Germany, Great Britain, Hungary, Ireland, Japan, Netherlands, Sweden, Turkey.

Hosts: *Acleris podana* SC., *A. variegana* DEN. & SCHIFF., *A. xylosteana* L., *A. hastiana* L., *Adoxophyes orana* F.R., *A. privitana* WLK., *Archips oporana* L., *A. podana* SCOP., *Cacoecimorpha pronubana* HB., *Clepsis celsana* KENN., *Croesia bergmanniana* L., *Epinotia caprana* F., *E. solandriana* L., *E. sordidana* HBN., *Epiphyas postvittana* WLK., *Grapholitha molesta* BUSCK., *Gravarmata margarotana* HEIN., *Gypsonoma minutana* HB., *Notocelia cynosbatella* L., *Pandemis cerasana* HB., *Rhyacionia buoliana* DEN. & SCHIFF., *Spilonota laricana* HEIN., *S. ocellana* F., *Tortrix viridana* L. (Lepidoptera: Tortricidae). *Neodiprion sertifer* GEOFFROY in FOURCROY (Hymenoptera: Diprionidae). *Euproctis chrysorrhoea* L., *Leucoma salicis* L. (Lep.: Lymantriidae); *Dendrolimus pini* L. (Lep.: Lasiocampidae); *Gelechia costella* WESTW. (Lep.: Gelechiidae); *Eupithecia tripunctaria* H.-S., *E. virgaureata* DOUB L., *Gnophos asperaria* HB., *Hemithea aestivaria* HB., *Operophthera brumata* L. (Lep.: Geometridae); *Pyralis farinalis* L., *Mecyna asinalis* HB. (Lep.: Pyralidae); *Udea alpinalis* DEN. & SCHIFF. (Lep.: Pyraustidae); *Eupsilia transversa* HFN., *Apamea remissa* HB. (Lep.: Noctuidae); *Mompha conturbatella* HB., *Blastodacna atra* HAW. (Lep.: Momphidae); *Yponomeuta plumbellus* DEN. & SCHIFF., *Y. padellus* L. (Lep.: Yponomeutidae); *Thaumetopoea processionea* L., *T. pityocampa* DEN. & SCHIFF. (Lep.: Thaumetopoeidae).

Description. ♀: Length of body 4.6 mm, of forewing 3.9 mm, of mesosoma 1.7 mm, of metasoma 2.2 mm, of ovipositor sheath 1.6 mm.

Antennae filiform, 26- to 33-segmented, long, all segments at least slightly longer than broad (fig. 27). Head strongly, contracted behind eyes, generally not strongly rounded; length of eyes 2.5 - 3.0 times length of temple in dorsal view. Ocelli large, OO = 1.0 - 1.5 times OD, protuberant, the ocellar area distinctly raised. Eyes large, protuberant inner

margins converging, but never strongly so. Malar space short, at most equal to half basal breadth of mandible. Face not strongly protuberant but often slightly raised medially, polished, finely punctate. Clypeus narrower than face, protuberant, polished, sparsely punctate, the ventral border often broadly and shallowly emarginate. Tentorial pits small, indistinct. Mandibles moderately twisted, short but fairly stout. Pronotum laterally smooth, punctate. Notauli deeply impressed, foveolate. Sternauli foveolate, narrow, often at least partly obsolescent; rest of mesopleuron polished, finely punctate.

Wings: Forewing 0.9 times as long as length of body, r as long as 3-SR, m-cu ante-furcal, cu-a inclivous (fig. 28). Hindwing 0.8 times as long as forewing, 1+M : 1r-m : 2-SC+R : SC+R1 = 13 : 12 : 16 : 15 (fig. 29).

Legs: Long, thin; hind coxa smooth (fig. 30), with a weak trace; tarsal claws always with a basal lobe.

Propodeal carinae weakly developed except for the medial transverse carina which is strongly raised, at least centrally; propodeum dorsally polished with a few obsolescent rugae between the carinae, the rugose sculpture sometimes rather stronger and occasionally reticulate-rugose though never strongly so.

Tergite one long, slender with distinct dorsal pits and glymmae; dorsal surface striate (fig. 31). Ovipositor long, 2.5 - 3.0 times length of tergite one, stout, usually slightly down curved at apex.

Legs long, slender; hind coxa polished and with fine puncturation, often reticulate-punctate ventrolaterally but never with distinct rugosity; hind tibia swollen, particularly in its apical half but not usually as broad as femur; tarsal claws strongly bent and with a large basal lobe. Recurrent always antefurcal, usually markedly so but occasionally almost interstitial.

Colour black except head, prothorax, legs and pterostigma which are yellow, tergite two is often also yellow or at least lighter in colour than rest of gaster; head always yellow except sometimes for a dark patch on vertex around ocelli and occasionally extending back to the occipital carina, legs also generally yellow except apex of hind tibia and of tarsal segments are infuscated. I have seen only one specimen of this species in which the head was almost completely dark, and in this specimen the legs were also rather dark. Lighter coloured specimens are not infrequent in occurrence; the thorax and gaster wholly or partly may be reddish testaceous rather than black. Rarely specimens are found which are wholly reddish testaceous except for the ovipositor sheaths which are black.

♂: Same as ♀ except antennae longer.

Material examined: Adana-Balcali, 37°02'52N/35°21'9E, 29.5.1996, 1. Afyon-Kocatepe, 38°31'60N/29°10'60E, 26.7.1997, 2.

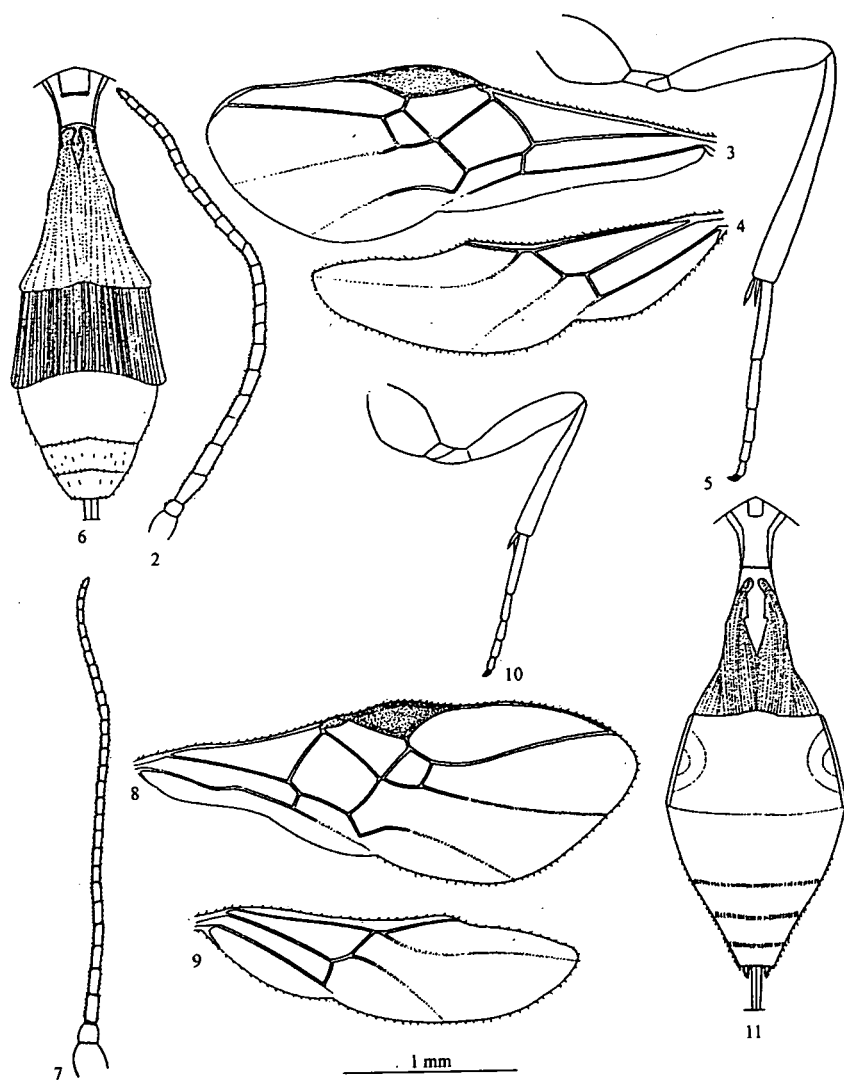
### *Meteorus unicolor* (WESMAEL, 1835) (figs 32-36)

*Perilitus unicolor* WESMAEL, 1835: 41, Lectotype, Belgium: Brussels, coll. WESMAEL (IRSNB), here designated (examined).

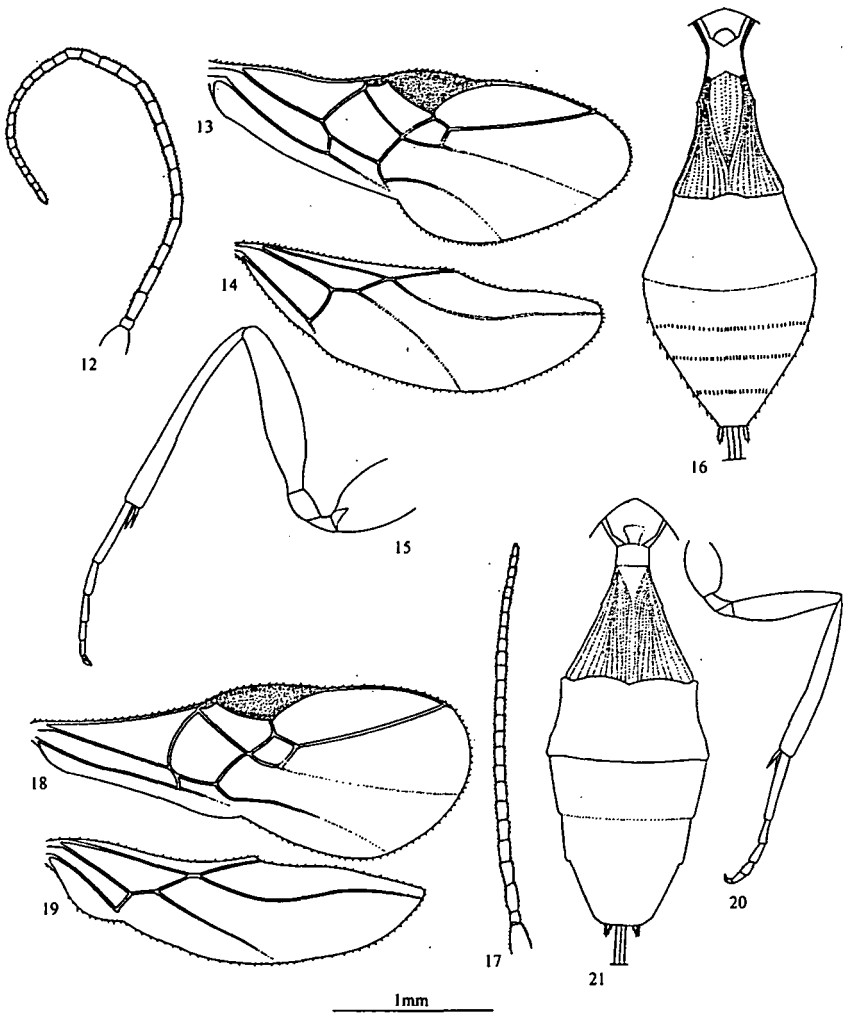
*Saproctichus chinensis* HOLMGREN, 1868: 430, Holotype ♀, China (NR) (examined), synonymized by HUDDLESTON 1980.

*Meteorus unicolor*: HUDDLESTON 1980.

Distribution: Belgium, Germany (West), Great Britain.

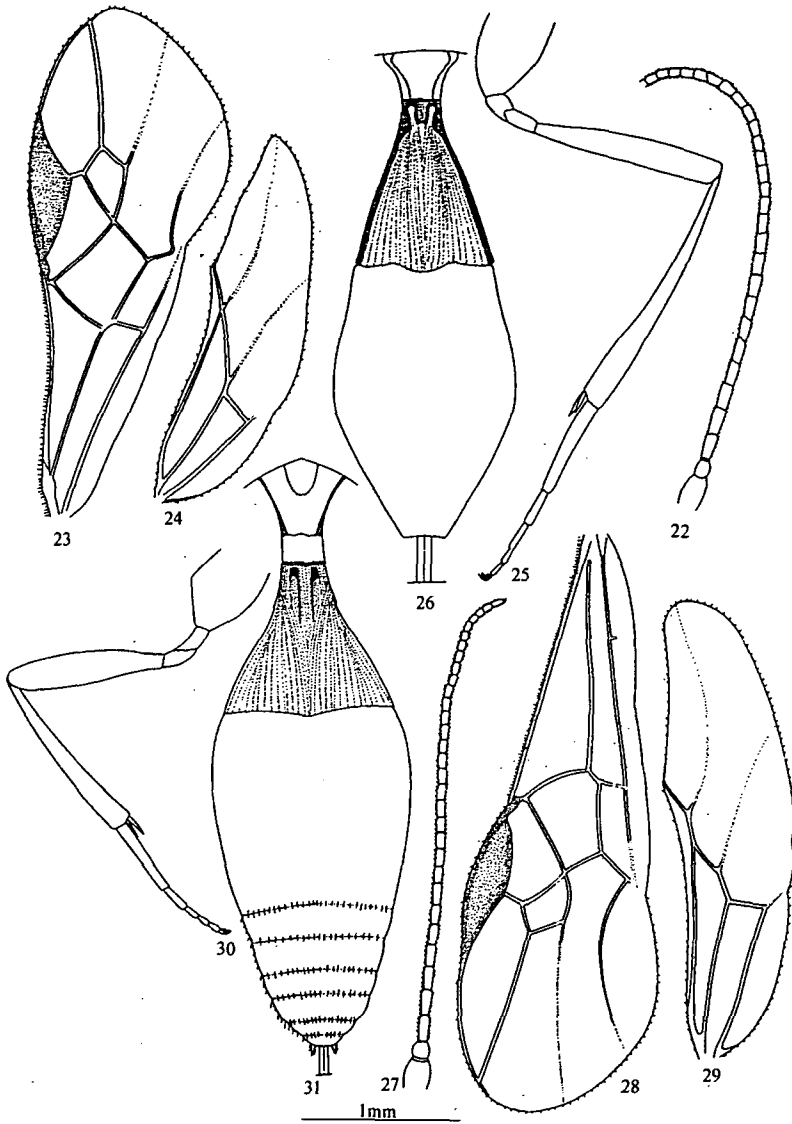


Figs 2-11. *Meteorus politutele* SHENEFELT: 2 antenna; 3 fore wing; 4 hind wing; 5 hind leg; 6 metasoma. *M. versicolor* WESMAEL: 7 antenna; 8 fore wing; 9 hind wing; 10 hind leg; 11 metasoma.

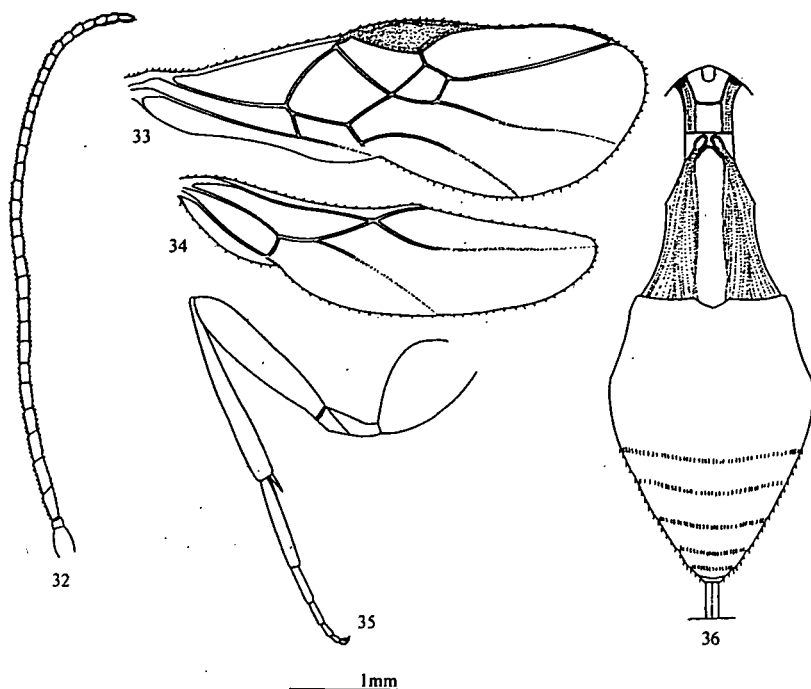


Figs 12-21. *Meteorus pulchricornis* WESMAEL: 12 antenna; 13 fore wing; 14 hind wing; 15 hind leg; 16 metasoma. *M. rubens* (NEES): 17 antenna; 18 fore wing; 19 hind wing; 20 hind leg; 21 metasoma.





Figs 22-31. *Meteorus gyrator* THUNBERG: 22 antenna; 23 fore wing; 24 hind wing; 25 hind leg; 26 metasoma. *M. ictericus* NEES2: 27 antenna; 28 fore wing; 29 hind wing; 30 hind leg; 31 metasoma.



Figs 32-36. *Meteorus unicolor* WESMAEL: 32 antenna; 33 fore wing; 34 hind wing; 35 hind leg; 36 metasoma.

Host: *Zygaena filipendulae* L. (Lepidoptera: Zygaenidae).

Description. ♀: Length of body 5.0 mm, of forewing 5 mm, of mesosoma 1.9 mm, of metasoma 2.4 mm, of ovipositor sheath 1.4 mm.

Antennae long, up to 36-segmented; all segments of flagellum distinctly longer than broad, at least twice as long as broad (fig. 32). Head contracted behind eyes; temples slightly shorter than eyes in dorsal view. Ocelli large, OO = 2 times OD. protuberant. Eyes protuberant, slightly convergent. Malar space about equal in length to basal breadth of mandible. Face 1.5 - 2.0 times as broad as high, not strongly protuberant but distinctly raised medially and there transversely rugose, laterally densely punctate. Clypeus strongly protuberant, densely rugulose-punctate with scattered long hairs. Mandibles long, slender, strongly twisted. Pronotum projecting little in front of mesonotum; coarsely rugose laterally. Notauli foveolate, broadened and reticulate-rugose anteriorly, coalescing posteriorly in a broad densely reticulate-rugose area. Sternaulus broadened, strongly reticulate-rugose; rest of mesopleurae smooth, punctate except for a large rugose area around the subalar prominence; prepectal carina strongly raised.

Wings: Forewing 1.03 times as long as length of body, r 0,44 times as long as 3-SR, m-

cu almost interstitial, cu-a inclivous (fig. 33). Hindwing 0.64 times as long as forewing, 1+M : 1r-m : 2-SC+R : SC+RI = 14 : 20 : 3 : 18 (fig. 34).

Legs: Hind coxa smooth, punctate, sometimes with weak rugosity dorsally at the base. Tarsal claws with a large basal lobe (fig. 35).

Propodeum broad, shallowly excavate posteriorly; coarsely reticulate-rugose and with no distinct carinae dorsally though there is sometimes a trace of median longitudinal and transverse carinae.

Tergite one stout with large dorsal pits and distinct glymmae; ventral borders of tergite only narrowly separated at mid point of segment; dorsal surface longitudinally striate (fig. 36). Ovipositor 0.6 times as long as length of body, thick, strongly swollen at base, straight. Hind coxa foveolate laterally, often with a few strong rugae dorsally.

Colour testaceous, base of tergite one paler yellow.

♂: Same as ♀ except for differences in genitalia.

Material examined: Adana-Balcali, 37°02'52N/35°21'09E, 19.8.1993, 1; 24.5.1997, 1. Hacı Ali Çiftliği, 37°1'0N/35°17'60E, 8.8.1999, 2, 1. Adana-Kadirli, 37°22'26N/ 36°05'46E, 18.12.1997, 8, 9. İçel-Gülümpasali, 36°19'0N/33°55'60E, 18.12.1997, 1, 1. Tekirdag-Uçmakdere, 40°47'60N/27°21'0E, 8.9.1999, 1. **New for Turkey!**

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