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Revisionary notes on the European species
of *Macrocentrus* Curtis sensu stricto *)
(Hymenoptera: Braconidae)

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Abstract

The European species of *Macrocentrus* CURTIS, 1833, with toothed claws (here provisionally referred to as *Macrocentrus* sensu stricto) are studied and a key is provided. The differences between *Macrocentrus marginator* (NEES, 1812) and *Macrocentrus nidulator* (NEES, 1834) are stressed; a new and closely related species, *Macrocentrus townesi* sp.n., is described. The Nearctic *Macrocentrus aegeriae* ROHWER, 1915, is removed from synonymy with *Macrocentrus marginator* (NEES, 1812) and lectotypes are designated for *Macrocentrus nitidus* (WESMAEL, 1835), *Macrocentrus cingulum* REINHARD (in BRISCHKE), 1882, and *Macrocentrus procerus* COSTA, 1884. *Macrocentrus grandii*

*) To Henry K. Townes on his 70th birthday.

GOIDANICH, 1937, is synonymized with *Macrocentrus cingulum* REINHARD (in B r i s c h k e), 1882, and *Macrocentrus procerus* COSTA, 1884, with *Macrocentrus nidulator* (NEES, 1834).

Zusammenfassung

Die *Macrocentrus* CURTIS, 1833, - Arten mit gezähnten Klauen von Europa wurden studiert und in einem Schlüssel erfaßt. Der Unterschied zwischen *Macrocentrus marginator* (NEES, 1812) und *Macrocentrus nidulator* (NEES, 1834) wurde betont. *Macrocentrus townesi* sp.n. wird beschrieben. *Macrocentrus aegeriae* ROHWER, 1915, wurde aus der Synonymie von *Macrocentrus marginator* (NEES, 1812) herausgelöst und wird als eigenständige Art geführt. Lectotypen wurden für die Arten *Macrocentrus nitidus* (WESMAEL, 1835), *Macrocentrus cingulum* REINHARD (in B r i s c h k e), 1882, und *Macrocentrus procerus* COSTA, 1884, festgelegt. *Macrocentrus grandii* GOIDANICH, 1937, ist synonymisiert mit *Macrocentrus cingulum* REINHARD (in B r i s c h k e), 1882, und *Macrocerus procerus* COSTA, 1884, mit *Macrocentrus nidulator* (NEES, 1834).

Since the publication of a revision of the European species of *Macrocentrus* CURTIS, 1833, by E a d y & C l a r k (1964) more information about this genus has been assembled and certain enigmatic species have been further studied. The present paper represents part of the preparatory work for the compilation of a new key to the Palaearctic species of *Macrocentrus* CURTIS, 1833, as are the papers of H a e s e l b a r t h (1978, 1979), H a e s e l b a r t h & v a n A c h t e r b e r g (1981) and v a n A c h t e r b e r g (1982). The provisional nature of the key presented in this paper should be stressed; there remain still specimens difficult to classify.

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N e e s v o n E s e n b e c k (1812, 1834) described
two species of *Macrocentrus*, i. e. *Macrocentrus margina-
tor* and *Macrocentrus nidulator*, which almost all subse-
quent students of the genus considered to be synonymous.
However, they were distinguished by E a d y & C l a r k
(1964) and we follow those authors. The N e e s collec-
tion is assumed to be destroyed and the types are there-
fore unavailable for examination. The main difficulty
with the distinction of these species is the occurrence
of apparent intermediates. Most of these intermediate forms
were considered by E a d y & C l a r k to belong to
a variety of *Macrocentrus marginator* (NEES, 1812) ("var.
3 W e s m a e l"). This solution to the problem is un-
satisfactory as further study reveals that in fact three,
and not two, species are involved. The third species
appears to be unnamed, and we wish to express our deep
admiration and gratitude to Dr. Henry K. T o w n e s
(Ann Arbor, U.S.A.) in naming it *Macrocentrus townesi*
sp.n.

For practical reasons the following key covers all
European species with toothed claws, i.e. with an acute
submedial lobe (fig.8). Species descriptions, as well as
the key itself, are based mainly upon female specimens.
In the males some of the distinguishing characters tend
to be less clearly developed and are often more variable.
Besides this females possess additional characters in
the length of the ovipositor (sheath) and the shape of
the tip of the ovipositor. However it should also be
possible to identify most of the males using the follow-
ing key.

Key to the European *Macrocentrus* species with an acute submedial lobe on the claws (fig.8; corresponding to couplets 7-9 of the key by E a d y & C l a r k 1964)

- 1 Temples virtually absent, eyes almost reaching hind margin of head (fig.47); length of eye in dorsal view more than 10 times length of temple; hind tibia completely yellowish; subbasal cell of fore wing (rather) evenly setose apically (fig.49).....
.....*thoracicus* (NEES, 1812)
Solitary parasite of *Tortricidae*, *Gelechiidae*, and *Oecophoridae*. Syn.: *Rogas longicornis* WESMAEL, 1835.
- Temples distinctly developed, eyes remain removed from hind margin of head (figs.14, 17, 27, 33, 50-52); length of eye in dorsal view less than 9 times length of temple; hind tibia usually fuscous apically; subbasal cell of fore wing often partly glabrous apically (figs.25, 30).....2
- 2 Mesoscutum predominantly yellowish or reddish; temples strongly receding behind eyes (figs. 50-52); length of eye usually 5-6 times length of temple in dorsal view.....3
- Mesoscutum predominantly blackish or dark reddish-brown; temples less strongly receding (figs. 14, 17, 27, 33); length of eye in dorsal view less than 5 times length of temple.....4
- 3 Head and metasoma (abdomen) largely black; hind tibia darkened apically; margins of pterostigma slightly infuscated; ocelli smaller (figs.50, 51), POL more than 1.5 times diameter of posterior ocellus, exceptionally as large as in *flavus*; propodeum partly coarsely rugose; vein SR (radiella) of hind wing virtually straight; precoxal sulcus more or less impressed
.....*bicolor* CURTIS, 1833
Solitary parasite of *Tortricidae* and *Oecophoridae*.
Syn.: *Rogas limbator* RATZEBURG, 1848; *Macrocentrus gracilipes* TELENGA, 1935.
- Head, metasoma, hind tibia, and pterostigma completely yellowish; ocelli larger (fig.52), POL about 1.5 times diameter of posterior ocellus or less; propodeum finely rugose, exceptionally rather coarse; vein

SR (radiella) of hind wing (weakly) curved basally; precoxal sulcus not impressed, except shortly posteriorly.....*flavus* SNELLEN VAN VOLLENHOVEN, 1878

Solitary parasite of *Pyrilidae*. Syn.: ? *Macrocentrus turanicus* TELENGA, 1950.

4 Palpi blackish; subbasal (submedian) cell of fore wing without trace of an opaque spot (figs. 5, 25); subterminal antennal segments rather short, at most 1.5 times as long as wide (figs. 2, 9, 20); longitudinal aciculation of metasoma (abdomen) usually fading away in middle of 2nd tergite, 3rd tergite almost or entirely smooth (fig. 18); apical part of upper valve of ovipositor behind notch comparatively robust (figs. 10, 12, 22).....5

- Palpi fair, pale or at most yellowish-brown; subbasal (submedian) cell of fore wing with at least a trace of an opaque (yellowish or brownish pigmented) spot (figs. 30, 45); subterminal segments of antenna 1.7 times as long as wide or longer (figs. 31, 38); longitudinal aciculation of metasoma reaching to 3rd tergite, fading out only in about midlength of tergite; apical part of upper valve of ovipositor behind notch rather slender (figs. 36, 39).....6

5 Flagellum of antenna of ♀ basally blackish; length of ovipositor sheath 1.8 - 2.2 times fore wing; subbasal (submedian) cell of fore wing sparsely setose apically (fig.25), exceptionally similar to *toumesei* sp.n., (fig.5); 1st subdiscal (brachial) cell of fore wing rather wide (fig.25); vein cu-a (nervulus) of fore wing almost vertical, meeting vein CU1 (brachius) in about a right angle (fig.25), exceptionally oblique and with acute angle; length of fore wing 4.5 - 6.5mm; body more stoutly built (fig.46); propodeum 1.7 - 1.9 times wider than its medial length (fig. 21); head less narrowed ventrally (fig. 16); vein 1-M of hind wing subequal to vein 1r-m (fig. 19), seldom longer; fore femur not widened medially and curved (fig. 24).
.....*nidulator* (NEES, 1834)

Solitary parasite of *Tortricidae* and *Gelechiidae* in flower-heads. Syn.: ?*Rogas longicaudis* HERRICH-SCHÄFFER, 1838; *Macrocentrus procerus* COSTA, 1884;

Macrocentrus curticaudis TELENKA, 1950 (Dr. V. I. Tobias, in litt.).

- Flagellum of ♀ yellow basally (black in ♂); length of ovipositor sheath 1.4 - 1.8 times fore wing; subbasal (submedian) cell of fore wing evenly setose (except near vein 1A; fig.5); 1st subdiscal (brachial) cell of fore wing narrower (fig.5); vein cu-a (nervulus) of fore wing sloping, sharply angled with vein CU1 (fig.5); length of fore wing 3.6 - 5.5 mm; body less stoutly built (fig.3); propodeum 1.4 - 1.8 times wider than its medial length (fig.15); head more narrowed ventrally (fig.13); vein 1-M of hind wing somewhat longer than vein 1r-m (fig.1); fore femur widened medially in respect to its apical part and not or slightly curved (figs.7, 23).....*townesi* sp.n.
- 6 Opaque spot of subbasal (submedian) cell of fore wing very faint, not or slightly pigmented (fig.45); temples comparatively short (fig.33), length of eye in dorsal view 3.0 - 3.6 times length of temple; middle lobe of mesoscutum strongly protuberant, its front (sub)vertical (fig.43); length of ovipositor sheath 1.5 times fore wing or less; 1st tergite comparatively slender (fig.42); head more narrowed ventrally (fig.32); sclerotized part of vein 2A of fore wing usually short (fig.41); length of body 4 - 7.6 mm, of fore wing 3.5 - 6 mm.....*nitidus* (WESMAEL, 1835)
Solitary parasite of *Tortricidae*.
- Opaque spot of subbasal (submedian) cell of fore wing usually with a well developed brownish pigmented spot (fig.30); temples comparatively longer (fig.27), length of eye in dorsal view 3 times temple or less; middle lobe of mesoscutum less protuberant and usually not (sub)vertical (fig.28); length of ovipositor sheath 1.6 - 1.8 times fore wing; 1st tergite rather robust (fig.29); head less narrowed ventrally (fig.26); sclerotized part of vein 2A of fore wing long (fig.37); length of body 6.5 - 9 mm, of fore wing 5.5 - 7.5 mm.....*marginator* (NEES, 1812)
Solitary parasite of *Sesiidae*, less commonly of *Tortricidae* and *Lycaenidae*. Syn.: *Rogas rugator* RATZEBURG, 1848.

Macrocentrus townesi sp.n. (figs. 1-15, 18, 23)

Macrocentrus marginator (NEES) var. 3 W e s m a e l ;
E a d y & C l a r k 1964:113.

♀: Fore wing 4.2 (4.3 in holotype) - 5.5 mm. Body slightly longer (type 5.0 mm), rather slender (fig.3). Ovipositor ca. 1.6 times as long as the fore wing. Antenna not much longer than the body, with 42 - 46 (type 44) segments; length to width of segment 3 about 5.0 - 5.5 : 1, of segment 4 about 4 : 1, of the penultimate segments about 1.5 : 1 (fig.9). Temples short, but distinct (fig.14). Face punctate, at the anterior end of a tiny and shallow median furrow from between the antennal sockets the punctation is somewhat irregular. Frons smooth and shiny, without (or with a vague) transverse furrow behind the antennal sockets and a pit in front of the median ocellus. Ocelli rather small (fig.14); POL : OOL : diameter of hind ocellus about 20 : 20-25 : 8-10. Maxillary palpi about 1.5 times height of head. - Mesosoma (thorax and propodeum) rather slender (fig.3), its length : height : width ca. 8 : 5 : 3. Middle lobe of mesoscutum not conspicuously protruding. Mesopleurum rather densely punctate (fig.3), metapleurum more strongly rugose. Propodeum rather irregularly, finely transversely rugose, about 1.4 times wider than its medial length (fig.15). Subbasal (submedian) cell of fore wing a little narrower than in *nidulator* (NEES, 1834); vein cu-a (nervulus) of fore wing sloping, forming a sharp angle with vein CU1 (fig.5); vein 1-M of hind wing (somewhat) longer than vein 1r-m (fig.1). - Legs moderately slender; hind femur about 6 times wider than long; fore femur widened medially in respect to its apical quarter and not, or slightly, curved (figs.7, 23); hind trochantellus usually with 4 small spines. - Tergite I nearly twice as long as wide apically (fig.18), longitudinally aciculate; aciculation of tergite II fades away towards the posterior end, exceptionally base of tergite III narrowly aciculate. Tip of ovipositor rather similar to *marginator* (NEES, 1812), with dorsal notch slightly further from apex (figs.10, 12 versus figs. 22, 36).

Black; legs reddish yellow (slightly brighter than in *nidulator* (NEES, 1834)), fore coxa and trochanters occasionally darkened; hind tibia usually less dark than in related species, often yellow not only basally but also more or less apically; hind tarsi often completely dark; basal segments of flagellum yellow, the antenna gradually darkened towards the apex; tegulae sometimes yellow, often brownish; wing venation brown, at the wing base less dark.

♂: Generally similar to the ♀, but antenna completely black. Fore wing 3.6 - 5.0 mm long; body slightly, but antenna much longer, with 38 - 43 segments. Tergite I ca. twice as long as wide, often more strongly striate than in the ♀. Males of this species are sometimes difficult to distinguish from those of *nidulator* (NEES, 1834). The best characters seem to be: sculpture and punctation which is usually stronger in *toumesei* sp.n.; 1st subdiscal (brachial) and subbasal (submedian) cells of fore wing are narrower, the latter cell evenly setose anteriorly (fig.5); vein cu-a of fore wing (nervulus) more oblique; propodeum usually longer, more finely and more transversely rugose; tergite I less robust (cf. fig.18 versus fig.21); fore femur slightly widened medially in respect to its apical quarter (cf. fig.23).

Holotype: ♀, "Museum Leiden, NEDERLAND, Heerde (Gld.), 15.VIII.-15.IX.1973, J.B. W o l s c h r i j n", "♀, *Macrocentrus* cf. *nidulator* (Nees), det. C. v a n A c h t e r b e r g, 1973", "44" (referring to the number of antennal segments). Deposited in the Rijksmuseum van Natuurlijke Historie, Leiden.

Paratypes: 24 ♀♀ and 16 ♂♂, England: 1 ♀, Surrey, Richmond Park, May 1926. - Netherlands: 1 ♀, Putten (Gelderland), in garden, Malaise trap, 29.X.-5.XI.1970, J.v.d. V e c h t; 2♀♀+1♂, Epen (Zuid Limburg), on *Daucus*, 27.VII.1943, S.J. v a n C o s t s t r o o m; 1 ♀, Cadier, 24.V.1980, B. v a n A a r t s e n; 2 ♂♂, Nunspeet, 6.VII. + 26.VII.1976, C.J. Z w a k h a l s. - Denmark: 1♀+1♂, NW. Bornholm, 15.-18.VIII.1953, J.G. B e t r e m. - Germany: 1 ♀, Barrien, 13.VII.1927; 1 ♀, Oldenbüttel, on *Tanacetum*, 10.VIII.1926; 2 ♀♀, Goslar, 1.VI. + 9.VI.1935, E. B a u e r; 1 ♀, München, 15.VIII,1943; 1♂, Memmingen,

Eisenburg, VII.1942, W. F o r s t e r ; 1 ♂, Murnau, 28. VII.1932, E. B a u e r ; 1♀+1♂, Garmisch, 31.VII.1950 + 2.VII.1926, E. B a u e r . - France: 1 ♀, Col de Dyone, 1500 m, 9.VII.1951, H. T e u n i s s e n . - Austria: 2♀+ 1♂, "Salvenberg", N. Tyrolia (this is probably the Hohe Salve near Kitzbühel), 1898, K o h l ; 1 ♂, Salzburg, Parsch, 10.VIII.1961, B a b i y ; 1 ♂, Kremsmünster, C z e r n y ; 1 ♀, Kirchberg/Pielach (Lower Austria); 1 ♂, Vienna, 4.IX.1955, M. F i s c h e r . - Jugoslavia: 1 ♀, NW. Slovenija, Kranjska Gora, 800-1200 m, 12.VI. 1980, C. v a n A c h t e r b e r g ; 1 ♂, Podčetrtek, 5.IX.1933, J a e g e r . - Italia: 2 ♀♀, Bolzano, Sarn- tal, 1250 m, 1.VII. + 4.VII.1976, C.J. Z w a k h a l s . - Bulgaria: 1 ♂, Rhodopi Mountains, N. Vardiovrach, A. Z a y k o v ; 1 ♀, Rhodopi, n. Izgrev, A. Z a y k o v . - 5♀♀+3♂♂ without or with indefinite data, probably most of them from Bavaria. Paratypes in the collection of both authors and in Munich Museum. Little is known of the biology of this species.

***Macrocentrus nidulator* (NEES,1834) (figs.16,17,19-25;46)**

Rogas nidulator NEES, 1834:204.

Macrocentrus nidulator; S h e n e f e l t 1969:164.

? *Rogas longicaudis* HERRICH-SCHÄFFER, 1838: no. 156.

Macrocentrus procerus COSTA, 1884:172. **Syn.nov.**

Macrocentrus curticaudis TELENKA,1950:298. **Syn.nov.** (de- formed ♀ according to Dr.V.I. T o b i a s (in litt.)).

♀: Fore wing 5.5 - 6.5 mm long. Body slightly and antenna still somewhat longer. Ovipositor almost twice as long as fore wing. Body more stoutly built than in the other species considered here (fig.46). Antenna with 43-47 segments, length to width of segment 3 about 5 : 1, of segment 4 ca. 4 : 1, of the penultimate segment about 1.3 : 1 (fig.20). Face evenly punctate, with a tiny oval median impression below the antennal sockets. Temples short, but distinct (fig.17).Frons smooth and shiny with a shallow transverse furrow behind the antennal sockets and a deeper pit in front of the median ocellus. Ocelli comparatively small (fig.17); POL : OOL : diameter of hind ocellus about 25 : 27 : 10. Maxillary palpi scar-

cely 1.5 times height of head. - Mesosoma (thorax and propodeum) comparatively stout (fig.46). Middle lobe of mesoscutum not conspicuously protruding. Propodeum rugose, 1.7 - 1.9 times wider than medially long (fig.21). - Subbasal (submedian) cell of fore wing without any opaque spot, with a glabrous patch apically (fig.25); 1st subdiscal (brachial) cell rather broad (fig.25); vein cu-a (nervulus) of fore wing curved, almost vertical, forming with vein CU1 of fore wing an almost right angle (fig.25). Vein 1-M of hind wing subequal to vein 1r-m (fig.19), seldom distinctly longer. - Legs somewhat more robust than in *marginator* (NEES, 1812); fore femur not widened medially and distinctly curved (fig.24); hind femur about 6 times as long as wide. Usually 4 small spines on hind trochantellus. - Shape and sculpture of tergite I - as in all the species treated here - rather variable; generally more robust than in the other species and with only faint, sometimes almost obsolete sculpture (fig.21). Tergite II with fine longitudinal aciculation, which usually fades out towards the end of the segment. Tergite III at most with traces of sculpture at its base, generally smooth, as the following tergites. Dorsal notch of ovipositor very close to its tip and the ovipositor rather steeply constricted to it, the apex of the ovipositor therefore appearing slightly more blunt than in the other species (fig.22).

Black; legs yellowish-red (slightly darker than in *marginator* (NEES, 1812)), coxae, trochanters and trochantelli of fore legs (sometimes of other legs, too) usually more or less blackened; tibia and tarsal segments of hind leg dark, pale at their bases; tegulae dirty yellow to black; veins of fore wing brown, at the base and in part of pterostigma often more brightly coloured.

♂: Fore wing 4.5 - 6.5 mm long; body somewhat, antenna much longer, with 44 - 49 segments. Tergite I less robust than in the female. Specimens examined: 79♀♀+13♂♂ from England, the Netherlands, Spain (Cuenca), Germany, Italy (San Martino di Castrozza; Sardinia), Austria, Jugoslavia, Hungary and Russia (Kamai, 20 km SE of Kungur, between Perm and Swerdlowsk). Collecting dates range from June to September, with peak in August.

With the material examined there is no information about hosts. According to E a d y & C l a r k (1964) the species parasitizes lepidopteran larvae in flower-heads of *Centaurea*.

Note: Due to the kindness of Prof. Dr. E. T r e m b l a y (Portici) the first author was able to examine the type-series of *Macrocentrus procerus* COSTA, 1884. In the original description only the ♀ was described, so the ♂ from Tissi is excluded; there remain 3 ♀♀, of which the ♀ from Simaxis, labelled "*Macrocentrus procerus* m." by C o - s t a, is here designated as lectotype. It has POL 3.6 times diameter of posterior ocellus, length of ovipositor sheath 2.15 times fore wing, length of fore wing 6.2 mm, fore coxa red, and apical fifth of subbasal (submedian) cell of fore wing largely glabrous. The 2 paralectotypes are from "Villacidro" and "Monte Vecchio"; all specimens are from Sardinia. The types are housed in the Zoological Museum of the University at Naples.

Macrocentrus marginator (NEES, 1812) (figs. 26-31, 34-37)

Bracon marginator NEES, 1812:14.

Macrocentrus marginator; S h e n e f e l t 1969:162-163.

♀: Fore wing 4.8 - 7.5 mm long; body somewhat longer and slender. Ovipositor sheath 1.6 - 1.8 times as long as fore wing. Antenna somewhat longer than the body, but shorter than the ovipositor, with 40 - 43 segments; length to width of segment 3 ca. 6 : 1, of segment 4 about 5 : 1, of the penultimate segment about 2 : 1 (fig. 31). Temples short but distinct (fig. 27). Face punctate, medially below the antennal sockets often somewhat rugose, at least rather coarsely punctate (fig. 26). Frons smooth and shiny, with a shallow transverse furrow behind the antennal sockets and a deeper pit medially. Ocelli a little larger than in *nidulator* (fig. 27). POL : OOL : diameter of hind ocellus about 21 : 20 : 12. Palpi very long, maxillary palpi almost twice as long as height of head. - Mesosoma slender (length : height : width ca. 10 : 6 : 4). Middle lobe of mesoscutum not particularly protruding (fig. 28). Mesopleurum evenly but not very densely punctate; metapleurum more strongly and densely

punctate; propodeum somewhat rugose, not much wider than long. - Subbasal (submedian) cell of fore wing with a brownish pigmented spot (fig.30), which in most specimens is rather distinct, and distally of this spot almost glabrous. Subdiscal (brachial) cell narrower than in *nidulator* (NEES, 1834). - Legs slender, length to width of hind femur about 7 : 1. Usually 5 small spines on the trochantellus of the hind leg. - Tergite I about twice as long as wide, longitudinally aciculate or finely striate. This aciculation extends to tergite II and generally to the base of tergite III. Apex of ovipositor rather finely pointed (fig.36).

Black; legs reddish-yellow, tibia (except the base) and 2 - 3 basal tarsomeres (except the apex) of hind leg dark; palpi pale, sometimes slightly brownish, but always much brighter than the base of flagellum; veins of fore wing brown, at the base like the tegulae yellow.

♂: Similar to the ♀. Fore wing 4.5 - 5.5 mm long. Antenna with 37 - 42 segments.

Specimens examined: 108♀♀+9♂♂ from England, the Netherlands, France, Germany, Switzerland, Northern Italy, Austria, Hungary, Eastern Siberia and the Ussuri region. Many of the specimens were reared from the following *Sesiidae*: *Synanthedon cephiiformis* O., *S. culiciformis* L., *S. formicaeformis* ESP., *S. myopaeformis* BKH., *S. spheciiformis* GERN. on *Alnus glutinosa*, *S. tipuliformis* CL., *S. vespiformis* L. and *Aegeria apiformis* CL. or *Bembecia hyalaeiformis* LASP. From other lepidopteran families the following hosts are reported: *Lycaenidae*: *Quercusia quercus* L. (as *Lycaena*) from *Quercus* sp. (Hungary, Nagykovaczi, Julianna - major, leg. Z. M e s z a r o s). - *Tortricidae*: *Epinotia caprana* F. (as *E. semifusca*) from *Salix viminalis* (Germany, Nieder-Weser, leg. E. J ä c k h). *Epinotia cruciana* L. (Italy, Southern Tyrolia, Sellajoch, leg. E. J ä c k h). - Collecting dates of the caught specimens are from spring to summer (April - August).

The black coloration of body and antenna, with palpi and coxae yellowish and a pigmented spot in the submedian cell of the fore wing distinguish this species. It mainly parasitizes *Sesiidae*, but its host range is not confined to this family.

From the Nearctic region another closely related species is known, which also parasitizes *Sesiidae*: *Macrocentrus aegeriae* ROHWER, 1915. E a d y & C l a r k (1964) synonymized *aegeriae* ROHWER, 1915, with *Macrocentrus marginator* (NEES, 1812). We cannot concur with this opinion and therefore give a short description of the differences between the two taxa.

Macrocentrus aegeriae ROHWER, 1915, stat.nov. (figs.48, 53 - 55)

Macrocentrus aegeriae ROHWER, 1915:56; E a d y & C l a r k 1964:113; S h e n e f e l t 1969:163.

♀: Fore wing 5.1 - 6.8 mm, body 6.3 - 9 mm long. Ovipositor about 1.7 - 1.8 times as long as fore wing. Head ventrally more narrowed than in *marginator* (NEES, 1812) (cf. fig. 32). Antenna somewhat longer than body, with 46 - 49 segments; length of 3rd segment 5 - 6 times its width, of 4th segment about 4 times, of penultimate segment about 2 times. Front of mesoscutum less steep than in *marginator* (NEES, 1812) (fig.48), i. e. middle lobe still less protruding than in the latter species; subbasal (submedian) cell of fore wing glabrous, except for at most a few setae; fore femur of ♀ usually slightly widened medially in respect to its apical quarter (fig. 55); apical part of upper valve of ovipositor less slender (fig.54). The vein 1-M of the hind wing may be shorter as well as longer than vein 1r-m. The most striking differences concern the coloration; the body is black, the ventral region of meso- and metathorax are reddish-yellow, the legs are yellow, the tip of the hind femur is darkened, the hind tibia is blackish with a pale base, and the hind tarsus is more or less strongly darkened. This taxon may be only a subspecies of *marginator* (NEES, 1812).

Specimens examined: U.S.A.: 4 ♀♀, N.Y., Ithaca, 1.-8. VIII.1939, B a b i y; 8♀♀+5♂♂, Mich., Ann Arbor, Malaise traps, 23.-30.VIII.1976, C. v a n A c h t e r b e r g; 3♀♀+1♂, id., VI.1976, I. & P. G a u l d.

Macrocentrus nitidus (WESMAEL, 1835) (figs. 32, 33, 38-45)

Rogas nitidus WESMAEL, 1835:175.

Macrocentrus nitidus; S h e n e f e l t 1969:165.

♀: Fore wing 3.5 - 6 mm, body 4 - 7.6 mm long. Ovipositor sheath about 1.4 times as long as fore wing. Antenna longer than ovipositor, with 41 - 49 segments; length to width of segment 3 ca. 6 : 1, of segment 4 ca. 5 : 1, and of the penultimate segment ca. 1.6 - 1.8 : 1. Temples short (fig. 33) and the head, when viewed from above, constricted almost immediately behind the eyes. Face only very indistinctly punctate, almost completely smooth (fig. 32). Frons smooth and shiny without a transverse furrow behind the antennal sockets and only with a median pit. POL : OOL : diameter of hind ocellus about 17 : 20 : 8. Palpi long, maxillary palpi about 1.7 times as long as height of head. - Mesosoma slender (length : height : width about 19 : 11 : 7). Front of mesoscutum vertical, its median lobe conspicuously protruding (fig. 43). Mesopleurum with fine and widely spaced punctures, towards the sternum almost entirely smooth; metapleurum more densely punctate; propodeum finely transversely rugose, the rugae forming, often rather indistinctly, a posteriorly open arch. Propodeum nearly as long as wide. - Subbasal (submedian) cell of fore wing with a faint opaque spot and with slightly less setae distally than medially (fig. 45), but frequently less setose than figured. - Legs very slender, length to width of hind femur about 7 : 1. Trochantellus of hind leg usually with 4 small spines. - Tergite I two to three times as long as wide, longitudinally aciculate (fig. 42). The aciculation extends over tergite II to about the middle of tergite III. Apex of ovipositor rather finely pointed (fig. 39).

Black; thorax sometimes partly brownish, legs contrasting yellow, hind tibia from about its midlength and hind tarsi brown; palpi and tegulae pale, wing venation light brown.

♂: Similar to the ♀. Fore wing 3.5 - 4.5 mm long. Antenna with 40 - 46 segments.

Specimens examined from collection W e s m a e l, Brussels (according to W e s m a e l, 1835, collected

near Brussels): Lectotype (here designated): ♀, "Coll. W e s m a e l", "1888", "♂, *Rogas nitidus* mihi ♀ det. C. W e s m a e l", "Type". - Paralectotypes: 3♂♂, same data as lectotype. - 1 ♂, same data as lectotype and additionally "var.?, palp. testaceis" (as no "var." is mentioned in W e s m a e l's description this specimen is probably a subsequent addition to his collection).

Additional material: 41♀+1♂, from England, Sweden (Skane), the Netherlands, Germany, Switzerland (Valais, Blatten, 1340 m and Fiesch, 1100 m; Tessin, Bignasco), Austria, Jugoslavia (Istria, Volosca) and France (Corse).

This is the smallest of the European species with toothed claws. It seems to be very closely related to *Macrocentrus bicolor* CURTIS, 1833, and - especially because there seem to exist specimens of *nitidus* (WESMAEL, 1835) with somewhat brightened coloration of part of the thorax - it is sometimes difficult to distinguish it from small specimens of *bicolor* CURTIS, 1833. This question requires further study.

Appendix

In the Rijksmuseum van Natuurlijke Historie at Leiden two females of *Macrocentrus* from the B r i s c h k e Collection, labelled *Macrocentrus cingulum* REINHARD, 1882, are present. The specimens were received from B r i s c h k e by S n e l l e n v a n V o l l e n h o v e n in the autumn of 1867; they bear the labels "Z" (attached by B r i s c h k e), "B r i s c h k e, Dantz." (in S n e l l e n v a n V o l l e n h o v e n's handwriting), "*cingulum* REINH." (id.), and "*Macrocentrus grandii* GOID., det. H a e s e l b a r t h, 1977". Obviously this is part of the reared material on which the enigmatic *Macrocentrus cingulum* REINHARD, 1882, in B r i s c h k e, 1882 (pp. 125, 145, 161) is based.

According to S h e n e f e l t (1969:149) it is a nomen nudum,, but B r i s c h k e (p.125) gives a (valid) description, viz., of the larvae ("Maden grün") and of the cocoons ("Cocons in gemeinschaftlichem braunem Gespinnste"). The latter is an indication of the gregarious way of life of this species. *Macrocentrus cingulum* REINHARD, 1882, was recorded by B r i s c h k e from

Sitochroa verticalis (LINNAEUS, 1758) (*Pyralidae*) and from *Orgyia antiqua* (LINNAEUS, 1758) (*Lymantriidae*); the latter host record should be checked as it may be parasitized only by *Macrocentrus linearis* (NEES, 1812) as far as the *Macrocentrinae* are concerned.

To fixate the name *Macrocentrus cingulum* REINHARD (in B r i s c h k e), 1882, we designate here the left specimen (of the 2 females glued on two small cards by one pin) as the lectotype of *cingulum* REINHARD, 1882. The lectotype is in good condition and the complete right antenna consists of 46 segments. Both types belong to *Macrocentrus grandii* GOIDANICH, 1937, and therefore *Macrocentrus cingulum* REINHARD, 1882, is a new senior synonym of this species.

Figures (p. 54 - 57)

Figs. 1-12, *Macrocentrus townesi* sp.n., holotype (but fig. 10 of ♀ paratype from Epen, Netherlands).

1, wing; 2, antenna; 3, habitus; 4, ovipositor; 5, 1st subdiscal cell and distal part of subbasal cell of fore wing; 6, hind leg; 7, fore leg; 8, inner hind claw; 9, apex of antenna; 10 & 12, apex of ovipositor; 11, mandible, dorsal aspect.

1-4, 6, 7: scale line (= 1 ×); 5: 2 ×; 8-12: 5 ×.

Figs. 13-15, 18, 23, *Macrocentrus townesi* sp.n., holotype (but fig. 23 of ♀ paratype from Epen, Netherlands).

Figs. 16, 17, 19-25, *Macrocentrus nidulator* (NEES, 1834), ♀, München, West Germany.

13 & 16, head, frontal aspect; 14 & 17, head, dorsal aspect; 15, mesosoma, dorsal aspect; 18, 1st-3rd tergites, dorsal aspect; 19, veins 1-M and 1r-m of hind wing; 20, apex of antenna; 21, propodeum and 1st tergite, dorsal aspect; 22, apex of ovipositor; 23 & 24, fore femur, lateral aspect; 25, 1st subdiscal cell and distal part of subbasal cell of fore wing.

13-15, 18, 23: 1.5 ×; 16, 17, 19, 21, 24, 25: scale-line (= 1 ×); 20: 2.5 ×; 22: 3.7 ×.

Figs.26-31, 34-37, *Macrocentrus marginator* (NEES, 1812), ♀, Wijster, Netherlands.

Figs.32, 33, 38-45, *Macrocentrus nitidus* (WESMAEL,1835), ♀, Wijster, Netherlands.

Fig.46, *Macrocentrus nidulator* (NEES, 1834), ♀, München, West Germany.

26 & 32, head, frontal aspect; 27 & 33, head, dorsal aspect; 28 & 43, mesoscutum, antero-lateral aspect; 29 & 42, 1st tergite, dorsal aspect; 30 & 45, 1st subdiscal cell and distal part of subbasal cell of fore wing; 31 & 38, apex of antenna; 34 & 40, veins 1-M and 1r-m of hind wing; 35 & 44, fore femur; 36 & 39, apex of ovipositor; 37 & 41, vein 2A of fore wing; 46, mesosoma, lateral aspect.

26-30, 34, 35, 46: scale-line (= 1 ×); 32, 33, 40, 42-45: 1.5 ×; 36: 3.7 ×; 37, 38: 2.5 ×; 39, 41: 3.5 ×.

Figs.47 & 49, *Macrocentrus thoracicus* (NEES, [1812]), ♀, Meijendel, Netherlands.

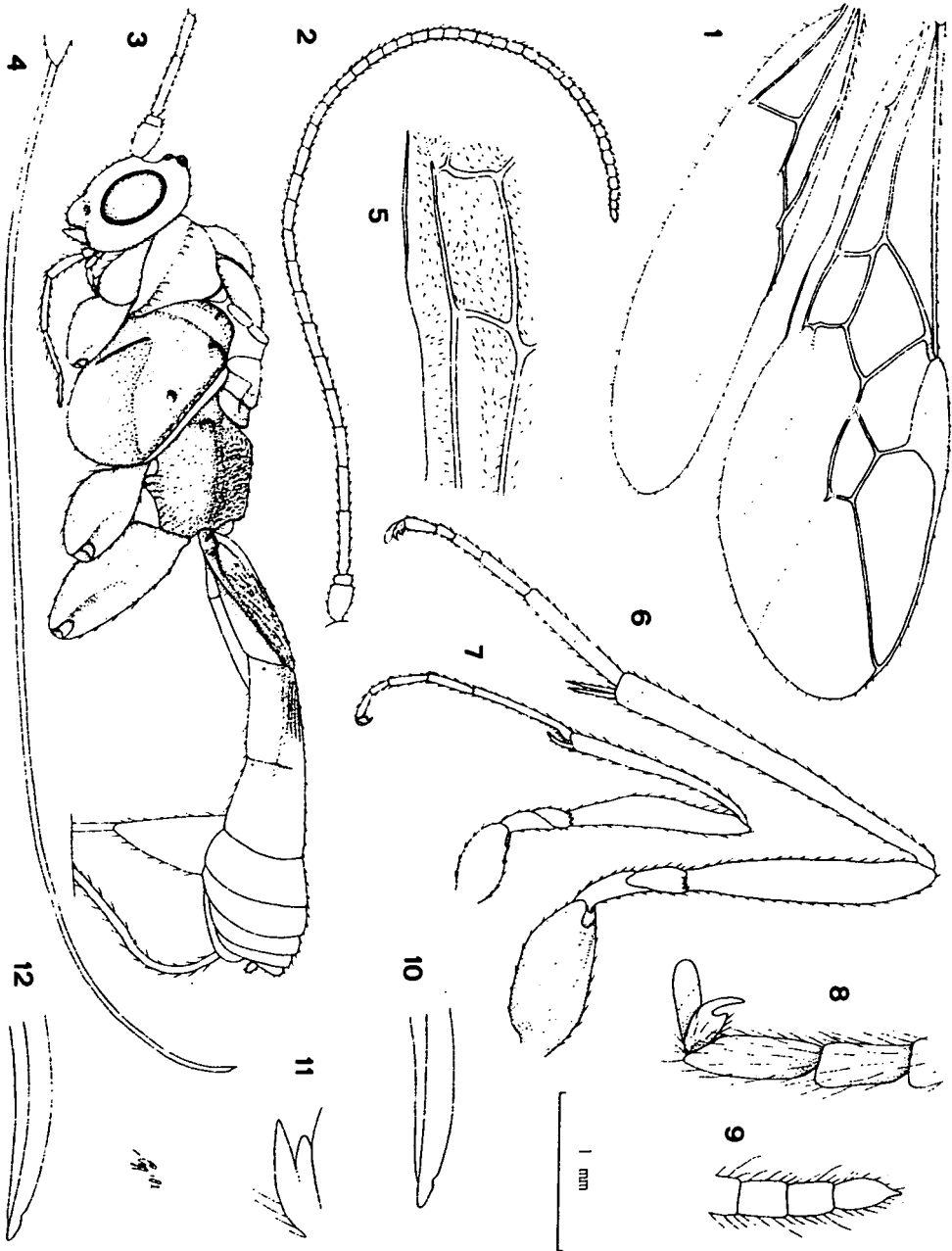
Figs.48, 53-55, *Macrocentrus aegeriae* ROHWER, 1915, ♀, Ann Arbor, U.S.A.

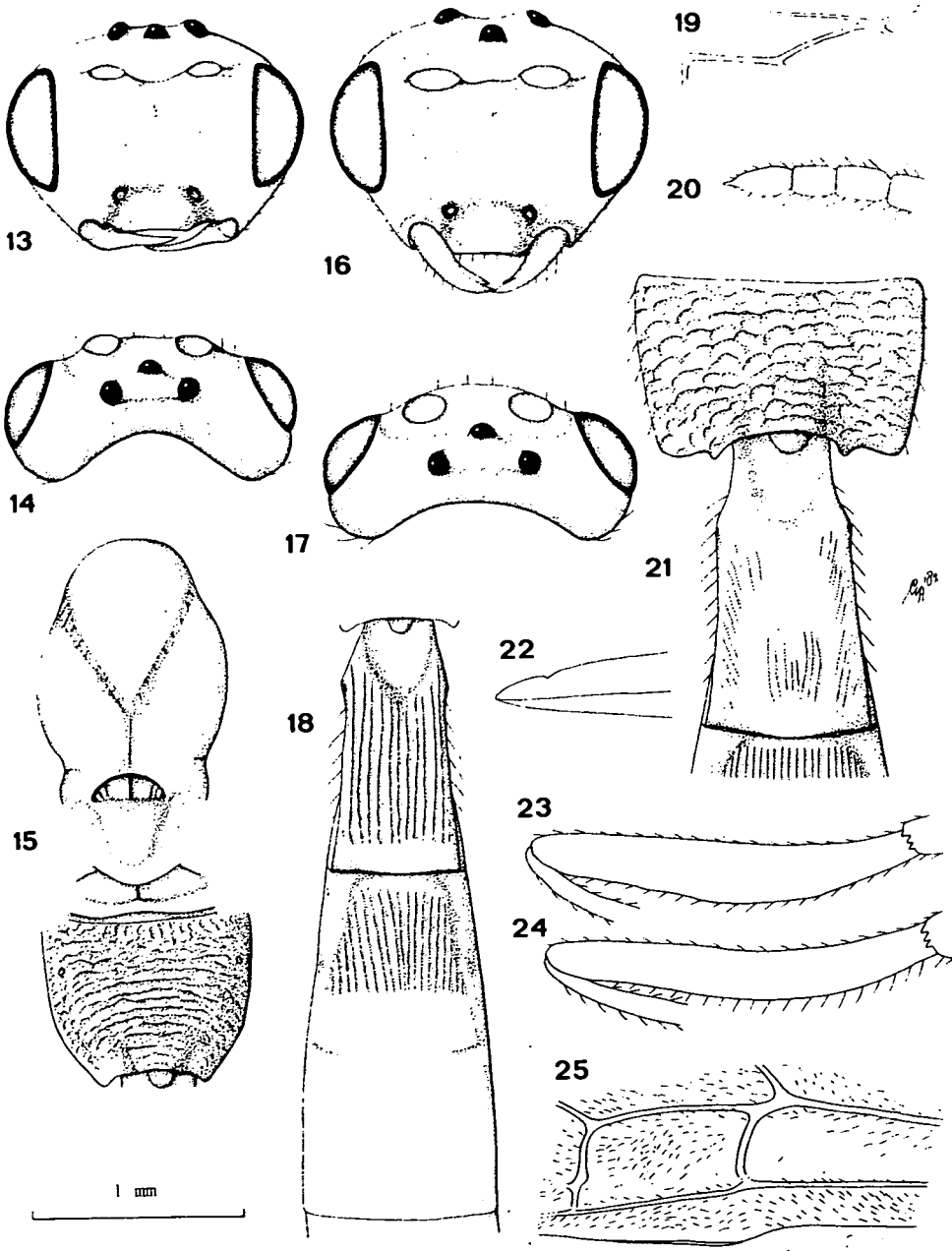
Figs.50 & 51, *Macrocentrus bicolor* CURTIS,1833, ♀, Oostvoorne (50) and Arkel (51), Netherlands.

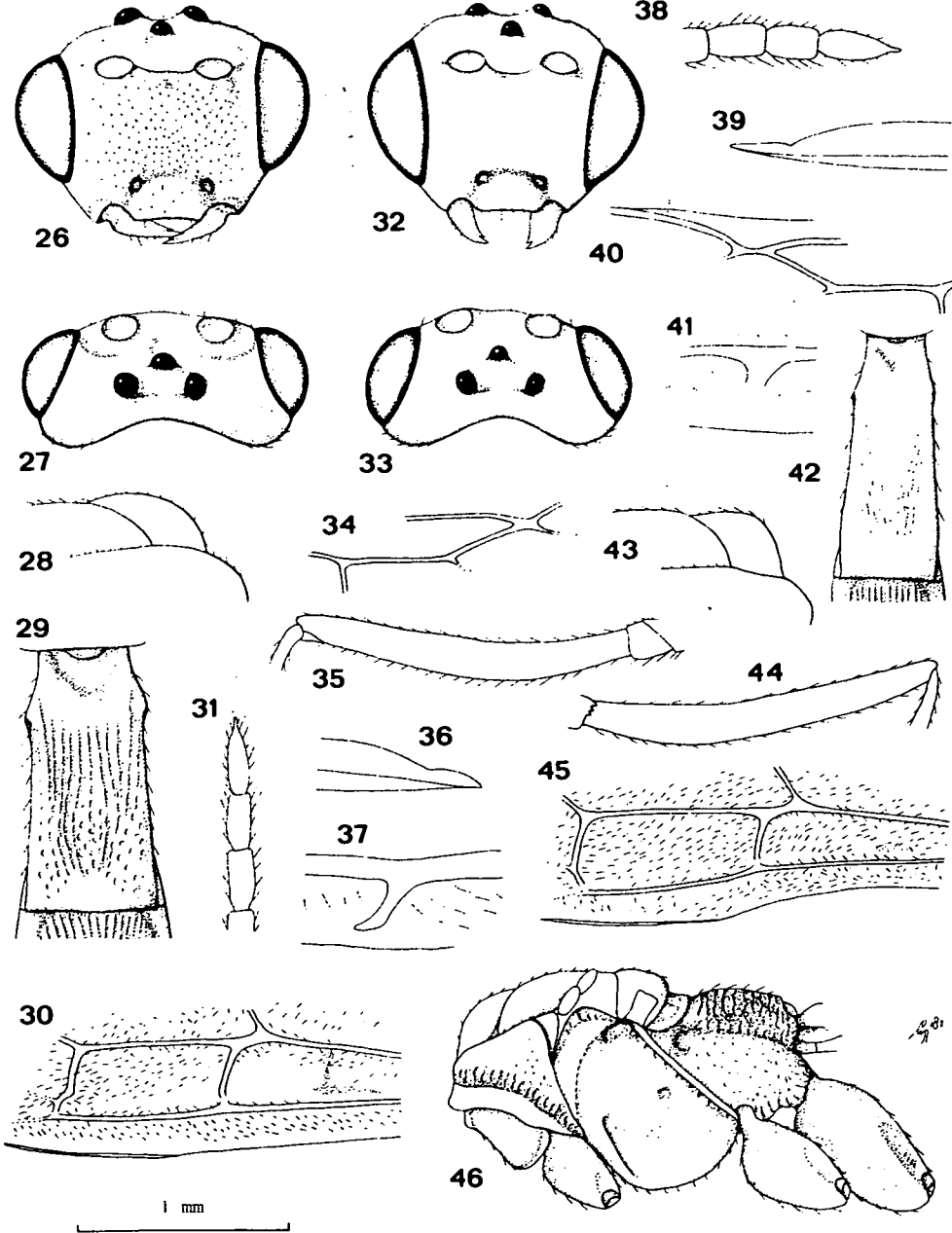
Fig.52, *Macrocentrus flavus* SNELLEN VAN VOLLENHOVEN, [1880]), ♀, neotype.

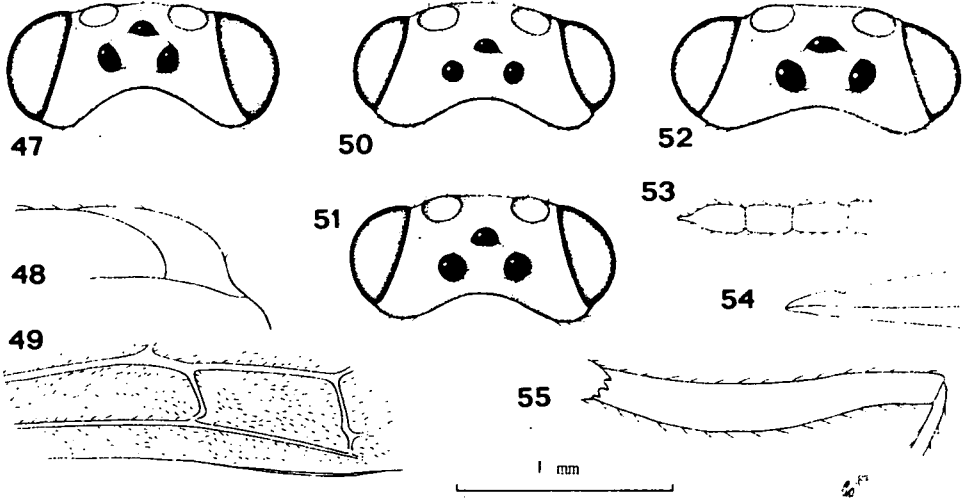
47, 50-52, head, dorsal aspect; 48, antero-lateral aspect of mesoscutum; 49, 1st subdiscal cell and distal part of subbasal cell of fore wing; 53, apex of antenna; 54, apex of ovipositor; 55, fore femur, lateral aspect.

47-51, 55: scale-line (= 1 ×); 52: 1.2 ×; 53: 2.5 ×; 54: 3.7 ×.









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