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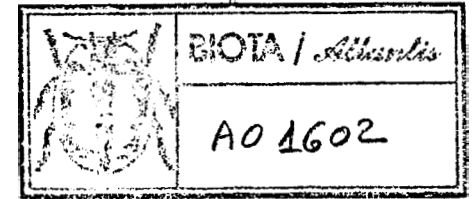
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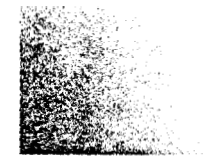
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Revision of the subfamily Macrocentrinae Foerster (Hymenoptera: Braconidae) from the Palaearctic region

C. van Achterberg

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Six new species of the genus *Austrozele* Roman, one new genus (*Rectizele*); type species *A. rectifera* **sp. nov.** from Korea, and eight species of the genus *Macrocentrus* Curtis are described and named. Keys to the Holarctic genera and to the Palaearctic species are added. New combinations: *Dolichozele gravitarsis* (*Muesbeck*, 1938); *Hymenochaonia delicata* (Cresson, 1872). The following synonyms are proposed: *Paniscozele sumatrana* Enderlein, 1920, and *Palinzele oceanica* Brues, 1922; *Austrozele longipes* (Holmgren, 1868); *Plectrobracon testaceus* Brèthes, 1927, with *Dolichozele vierecki*, 1911; *Eubadizon dubius* Wesm., 1835; *Macrocentrus affinis* Hedwig, 1799, and *M. shenefelti*, 1969, with *M. collaris* (Spinola, 1808); *Macrocentrus bicoloripes* van Achterberg, 1993; *Macrocentrus hungaricus* Marshall, 1893; *Helcon intricator* Ratzeburg, 1852, with *M. resinellae* (Linnaeus, 1758); *Macrocentrus cordatus* Papp, 1989, with *M. spilotus* van Achterberg & Belokobylskij, 1987; *Macrocentrus enderleini* and *Laevis Sliarina*, 1982, with *Austrozele* Roman, 1910; *Pachymerella* Enderlein, 1927, with *Hymenochaonia Dalla* Torre, 1898; *Neozele* Brues, 1926, and *Plectrobracon* Brèthes, 1927, with *Viereck*, 1911; *Pseudophylacter* Fahringer, 1929, with *Macrocentrus* Curtis, 1833.

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(figs 276,277)

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Macrocentrus grandii Goidanich, 1937: 196, figs; Watanabe, 1967:9-10; Shenefelt, 1969: 154-155; Tobias, 1971[1975]: 103,104,1976:129, 1986: 257; Marsh, 1979: 188; Papp, 1982a:108; Haeselbarth, 1983:16; van Achterberg & Haeselbarth, 1983:51-52 (synonymized with *M. cingulum*).
Macrocentrus gifuensis auct.

Material.— 23 ♀♀ + 21 ♂♂ (RMNH) from The Netherlands (Achtinaal; Asperen; Elzeterbosch (L.); Lelystad (Oostvaardersplassen); Liempde; Nunspeet; Putten (Gld.); Rijckholt (L.); Schaesberg (2 km N. Heihof; L.); Thom (L.); Venlo; Waarder; Wageningen; Wijster; Winterswijk); 4 ♀♀ + 2 ♂♂ (RMNH) "Deutschland, Schwarzwald, Simonswald, 17.vi.1988, N.W. Elfferich"; 1 ♀ + 1 ♂ (RMNH) "Cardiff, U.K., coll. cat. 1.v.[19]81, em. 12.vi.1981, ex *Pleuroptya ruralis* (Hübner) (Pyr.), A. Davis"; 1 ♀ (RMNH) "[Bulgaria], 17.ix.1977, Rhodopi, Chrabrino, leg. A. Zaykov"; 1 ♂ (RMNH) "[Bulgaria], 8.ix.1977, Rhodopi, Markovo, leg. A. Zaykov"; 5 ♂♂ (IWNH), id., but Gornoslav, 4.vii.1985; 1 ♀ (RMNH), id., but Habrinio, 700 m, 6.vii.1985; 1 ♀ (IWNH), id., but G. Voden, 24.vii.1985; 2 ♀♀ + 2 ♂♂ (RMNH) "S. Korea, Chong-Song, ex Tortricid on Vitaceae, em. 27.viii.1980, J. Paik"; 3 ♀♀ + 2 ♂♂ (KMNH) "S. Korea, Sumcoi, ex *Ostrinia furnacalis* (Gueneé), em. 30.viii.1979, J.C. Paik"; 2 ♂♂ (RMNH) "S. Korea, Eumseong, Chungchongbug-Do, ex Lepidopterous larvae on soyabem, em. 16.viii.1974, J.C. Paik"; 1 ♀ (IWNH) "Japan, Gaga Cpa-zao, Miyagi Pref., 31.vii.1981, A. Takasu"; 1 ♀ (EIS), "[Japan], Sapporo, Hokkaido, 9.ix.1965, K. Kusig", "*Macrocentrus pallipes* (Nees). Det. C. Watanabe, 1967"; 2 ♀♀ + 1 ♂ (RMNH) "[China], Xiaoshan iii Zhejiang, PRC, 21.vii.1964, Jin Drndi", "Hosi: *Ostrinia nubilalis* (Hübner), No. 64056.1".

Biology.— Recorded as a polyembryonic parasite of Pyralidae (e.g., it is an important parasite of the European corn borer, *Ostrinia nubilalis* (Hübner, 1796), and *Sitochroa verticalis* (Linnaeus, 1758)), and possibly of Lymantriidae: *Orgyia antiqua* (Linnaeus, 1758) (Brischke, 1882, but this host needs to be confirmed). Recorded also as parasite of pyralid larvae in nest of *Rhynchium oculatum* (Fabricius, 1781) (Vespidae; Goidanich, 1937), and of Noctuidae and Nymphalidae (Shenefelt, 1969).

The three specimens from China are rather aberrant because the length of the first metasomal tergite is 1.6-1.9 times its apical width (2.0-3.2 times in West Palaearctic specimens), the length of the maxillary palp is about 1.4 times height of head (1.5-1.7 times), and the length of the ovipositor sheath is 1.2-1.3 times fore wing (1.4-1.6 times).

Distribution.— Palaearctic (Europe, North Korea, Japan), and introduced in North America from France, Korea and Japan.

Macrocentrus spec. nov. M& Lou, 1993
(figs 419-424)

Macrocentrus spec. nov. He & Lou, MS.
Macrocentrus buolianae; Papp, 1982a: 108.

Material.— 1 ♀ + 1 ♂ (RMNH), paratypes of new species to be described by He & Lou (MS), with label data largely in Chinese characters, 28.vii.1981, 820533 (♀) and viii.1979, 870417 (♂); 1 ♂ (TAM), "Korea: Prov. N Hwanghae, Sariwon, 28.ix.1978, leg. Dr. A. Vojnits et L. Zombori, No. 423", "*Macrocentrus buolianae* E. Cl., ♀, det. Papp, 1981".

Note.— Very similar to *M. thoracicus* (e.g. shape of temples, length of vein 1-CU1

of fore wing, colour of legs, setosity of subbasal cell of fore wing) but the new species has the first metasomal tergite more slender, flat basally, and with transverse sculpture medially (fig. 420); the tarsal claws with minute lobe (fig. 419); the head an inetasoma yellowish; the prepectal carina complete behind fore coxa, the propodeur coarsely and remotely reticulate rugose, and vein 3-SR of fore wing comparatively long (fig. 421).

May be confused with *M. buolianae*, e.g. the tarsal claws, the mandibles, the colour of body and the (completely setose) subbasal cell of fore wing are similar. However, the new species has the length of eye in dorsal view 10-13 times temple (similar to length of eye of *M. thoracicus*, but about 7 times in *M. buolianae*), POL about 0.7 times OOL (about equal in *M. buolianae*), number of antennal segment about 52 (44-45 in *M. buolianae*), the pterostigma is at least basally yellowish (pale brown in *M. buolianae*), length of vein 3-SR about 1.6 times 2-SR (about equal in length in *M. buolianae*), length of first metasomal tergite about 3 times its apical width (somewhat shorter in *M. buolianae*) and length of ovipositor sheath about 1.0 times fore wing (about 0.9 times in *M. buolianae*).

Biology.— Solitary parasite of the rice leafroller or rice case worm, *Cnaphalocrocis medinalis* (Gueneé) (Tortricidae). The cocoon is slender spindle-shaped, and grey, situated within the stem of the hostplant.

Distribution.— China, Korea.

Macrocentrus collaris (Spinola, 1808)
(figs 225-236, 244, 257-264)

Bracon collaris Spinola, 1808: 140 [type lost; not listed by Casolari & Casolari Moreno, 1980].
Macrocentrus collaris; Shenefelt, 1969: 149-150; Papp, 1970: 64, 1971: 53, 1973: 8-9, 1980: 403, 1983: 320, 1984: 42, 1989: 82; Tobias, 1971[1975]: 103, 104, 1976: 128, 1986: 253; Haeselbarth, 1985: 17; van Achterberg & Belokobylskij, 1987:255, figs 58-63; Koponen, 1992: 196-197.
Bracon ebeninus Nees, 1834: 67-68 [type lost].
Eubadizon dubius Wesmael, 1835: 118 [holotype examined]; Shenefelt, 1970: 234. Syn. nov.
Macrocentrus collaris var. *arctius*: Vidal, 1993: 6.
Macrocentrus picipes Haliday, 1835: 140 [holotype examined].
Macrocentrus affinis Hedwig, 1961: 95 (not *M. affinis* Muesebeck, 1932) [holotype examined]. Syn. nov.
Macrocentrus affinioides Shenefelt, 1969: 144 [holotype examined]. Syn. nov.

Material.— Holotype of *M. affinis* and *M. affinioides*, ♀ (ZIL), "Afghanistan, Qadès, (SE Qaléh Naou, 2.vii.1959, alt. 1320 m, leg. K. Lindberg", "A-685", "685c", "Holotypus *Macrocentrus affinis* Hedwig"; holotype of *M. dubius*, from Belgium, ♀ (KBIN), examined; 1 ♂ (RMNH), "England, Mitcheldean nr Monmouth, 9.viii.1961, P. Staffeleu"; 1 ♂ (RMNH), "Sweden, Vb., Umea, 2.viii.1981, L. Huggert"; 10 ♀♀ + 2 ♂♂ (RMNH), "W. Germany (Bay.-Dachau), Röhrmoos, 5.i.1998, in house, S. Blank"; 2 ♂♂ (RMNH), "W. Germany, Aachen, Seltent, ca 200 m, 19.vi.1981, C.v. Achterberg et al."; 1 ♀ + 1 ♂ (RMNH), "[Germany] Reinh[ard], Saxon."; 1 ♂ (RMNH), "[Czech Republic], Mähren, Weisskirchen"; 1 ♀ (RMNH), "[Poland], Brischke, Dantz[ig]"; 1 ♀ (RMNH), "Andorra, St. Julia, 16.ix.[19]82 (♀), P.J.L. Roche"; 3 ♀♀ (RMNH), "[France], Ardèche, Lavilledieu, 5-9.viii.1976, leg. H. Teunissen"; 1 ♀ (RMNH), "France, Ht Alpes, Eyglers, 1000 m, 26.vii.1987, A. Teunissen"; 3 ♀♀ + 1 ♂ (RMNH), "France, Drôme, M.J. Gijswijt", "Lachau, 8 km E. Séderon, 13.ix.1989"; 1 ♂ (RMNH), "[France], Ardèche, St. Rémyze, 8.viii.1976, leg. H. Teunissen"; 2 ♂♂ (RMNH), "France, Ardèche, Chomirac, 1-7.viii.1977, K.J. Huisman"; 1 ♀ (RMNH), "France, Avignon, ex *Sesamia* sp. (Noctuidae), RMNH'85"; 1 ♀ + 1 ♂ (RMNH), "Excursie Frankrijk, Cestas [(Gironde), 2.vi.1955"; 1 ♂ (RMNH), "Frankrijk, St. Algrève, 1.viii.1952, H.C. Blöte"; 1 ♀ (RMNH), "France, Drôme, Séderon, Col de Macuëgne, 29.ix.1987, M.J. Gijswijt"; 1 ♀ (RMNH), "France, Var, Fréjus, on *Cupressus*, 15.x.1987, M.J. Gijswijt"; 1 ♀ (RMNH),

"Corsica, 1050 m, 2 km W. v. Vizzavona, II.viii.1956, R. Blöte"; 1 ♀ (RMNH), "Corsica, Tattone, bij Vizzavona, 700 m, 232.viii.1956, Blöte & Hesselbach"; 1 ♀ (RMNH), "Austria, N.O., Gaslern, 19.vii.1982, C.J. Zwakhs"; 12 ♀♀ + 2 ♂♂ (RMNH), "Österreich, Piesach, Kärnten, 3-15.vi.1973, J.U. Wolschrijn"; 1 ♂ (IWNH), "Österreich, Tirol, Ötztal, Vent, Auf Stablein, 2200-2400 m, 29.vii.1967"; 1 ♀ (RMNH), "CSSR, Slovensko, Kolinany, 8 km NO v. Nitra, 20.vii.1968"; 1 ♀ (RMNH), id., but Pohranice, 6 km NE of Nitra, 23.viii.1968; 3 ♀♀ (BMNH), "Hungary, Baranya-megya, Nagyarsany, 6.vii.(1), 22.vii.(2) 1963"; 1 ♀ (BMNH), "Poland, Morskie Oko, 6.vii.1932, Tatra Mts, 4600 ft."; 20 ♀♀ + 13 ♂♂ (IWNH, ITZ) from The Netherlands (Axel (2.); Bilthoven; Delft; Drunen; 's Gravenhage; Leiden (Knotterpolder); Melissant; Nunspeet; Putten (Krachtighuizen); Roitumeroo; St. Pietersberg (Zonneberg, Heerderberg, Cannerbos); Tegelen; Vilt (L.); Voorschoten; Weesp); 1 ♀ (Valencia), "[Spain], Garos, 19.ix.[19]85"; 7 ♀♀ + 3 ♂♂ (RMNH), "[Spain], E. Mallorca, Porto Christo, 17-24.iii.1980, Exc. Univ. Leiden"; 6 ♀♀ + 1 ♂ (KMNH), "[Spain], Torreveija (Alica), 23.v.1984, leg. H. Teunissen"; 1 ♀ (RMNH), "East Spain, Altea, 10 km N of Benidorm, 13.iv.1982, Exc. Univ. Leiden"; 1 ♀ (RMNH), "East Spain, Albufera de Elche, 23.iv.1982, Exc. Univ. Leiden"; 10 ♀♀ + 1 ♂ (RMNH), "[Spain], E. Spain, (Alicante), Orihuela, 24.v.1984, A.P.J.A. Teunissen, RMNH-1984; 1 ♀ (RMNH) "East Spain, Exc. Univ. Leiden"; "Benidorm, 24.iv.1982"; 1 ♀ (IWNH), "[Spain], Novelda (Alicante), 15.iv.1984, leg. H. Teunissen"; 1 ♀ (RMNH), "España, Valencia, Moraira, 16-30.v.1981, B. van Aartsen"; 5 ♀♀ + 2 ♂♂ (RMNH), "Spanje, Estepona, 3.x.1952, Bär, Blöte, de Jong & Osse"; 1 ♀ (IWNH), id., but Ecija, 18.ix.1952; 1 ♀ + 1 ♂ (RMNH), id., but 15 km NW of Tarifa, 27.ix.1952; 1 ♀ (IWNH), id., but 30 km ZW of Malaga, 4.x.1952; 3 ♀♀ (IWNH), id., but Velez Rubio, 10.x.1952; 1 ♀ (IWNH), "Esp., Alic., Altea, 22.vi.1978, leg. H. Teunissen"; 6 ♀♀ (IWNH), id., but 1-14.vi.1978; 15 ♀♀ (RMNH), "Spain, Huelva, 1 km N El Romipido, 13.v.1981, C. Gielis, at light"; 2 ♀♀ (RMNH), "España, Alicante, Denia, 15.v.1970"; 6 ♀♀ (RMNH), "España, Rosas, 100 m, Paradise Villas, 2-9.x.1988, LF, Rezbanyai-Reser"; 1 ♀ (RMNH), "[Canary Islands], Tenerife, Sta. Ursula, I.vii.1979, M. Báez"; 1 ♂ (IWNH), id., but 15.ix.1959, R. Arozarena; 1 ♀ (RMNH), "[Canary Islands], Fuerteventura, 10.iii.1984, leg. H. Teunissen"; 1 ♂ (IMNH), "[Canary Islands], Fuerteventura, La Asomada, 21.ii.[19]80, G. Ortega"; 4 ♀♀ + 1 ♂ (RMNH), "Portugal: Azores, 1992, P. Gloria & L. Oliveira, RMNH'92"; 2 ♀♀ + 1 ♂ (RMNH), "[Portugal], Madeira: Machico, ex fullgrown caterpillar of *Chrysodeixis chalcites* (Esp.), coll. iv.1982, em. v.1982, leg. Stünning; 1 ♀ (UMNH), "[Portugal], Madeira Is., Porto Santa, 21-27.ii.1963, EW. Classey"; 2 ♀♀ + 1 ♂ (IWNH), "Portugal, Oeiras, 27-31.viii.1979 (1 ♀, 2 ♀♀ of 7-14.ix.1979, 1 ♂ of 30.viii-4.ix.1979), A. v. Harten"; 1 ♀ (RMNH), "Portugal, nr Costa da Caparica, 11-12.ix.1079, A. v. Harten'97"; 1 ♂ (RMNH), "Follaterres, Suisse, Martigny-Wallis, 21-25.viii.1975, leg. H. Teunissen"; 1 ♀ (RMNH), "Italia, Villnöss, Fune, oriv. Bolzano, 1100-1400 m, 13.v-30.v.1965, G. van Rossem"; 1 ♀ (RMNH), "[Italy], Gargnano, Lago di Garda, 13.x.1968, v. Ooststroom"; 1 ♂ + 1 ♀ (IWNH), "[Italy], Legnaro, 9.viii.1964"; 1 ♂ (RMNH), id., but 8.viii.1964; 1 ♀ (RMNH), "Yugoslavia, Kroatie, Jusici, 14.vii.1979, leg. H. Teunissen"; 1 ♀ (IWNH), "Jugoslavija, Srbija, Radavac, 8 km N v. Pec, 16.viii.1965"; 3 ♀♀ + 1 ♂ (RMNH), "[Bulgaria], Rodopi, 19.vi.1975 (1 ♂ 12.v.1976, 1 ♀ 23.vi.1976, 1 ♀ 19.viii.1975), Nikolovo, leg. A. Zaykov"; 1 ♀ (RMNH), id., but Belica, 8.viii.1985; 1 ♀ (RMNH), id., but Starja Elnovo, 25.vi.1980; 2 ♂♂ (RMNH), id., but Semkovo, 6-8.viii.1985; 1 ♂ + 1 ♀ (RMNH), id., but Karamansi, 20-26.v.1976; 1 ♀ (RMNH), id., but Varna, 29.vii.1979, J. Kolarov; 1 ♂ (RMNH), id., but Barja Plovdiv, 4.v.1981; 1 ♂ (RMNH), id., but Plovdiv, 30.iv.1983; 1 ♂ (IWNH), id., but Parvomay, 23.ix.1981; 1 ♀ (IWNH), "[Bulgaria], Rodopi, Pishelarovo, 26.vi.1976, leg. A. Zaykov"; 1 ♀ (IWNH), "[Bulgaria], Rodopi, Dolno Lucovo, 29.iv.1977, leg. A. Zaykov"; 3 ♀♀ (UMNH), "[Greece], Rhodes, nr Miramara, 24.iv.1962, W.H. Tams"; 1 ♀ (UMNH), "Greece, Kifisia, 8-25.vi.1974, L.A. Mound, Malaise trap"; 1 ♀ (IWNH), "Ellas, Thessalia, 10 km n. v. Litochoron, 19.ix.1962"; 4 ♀♀ (IWNH), "S. Greece, Lakonia, 5 km S of Monemvasia", "7.vii.1980 (1 ♀, 2 others 7.viii.1980, one 27.vii.1983), G. Christensen"; 2 ♂♂ (RMNH), "Turkey: Hakkari, Sat Dag, Varegös, SW Yäsekova, 1700 m, 4-8.viii.1983, W. Schacht, IWNH; 1 ♂ (RMNH), "Turkey: (Van), Van, 1800 m, 13.vii.1987, leg. R. Hensen"; 16 ♀♀ + 41 ♂♂ (RMNH), "Yemen, Sana'a (749), Malaise trap, ii.1992, A. v. Harten, RMNH'92".

Notes.— Males are black or dark brown; females have at least part of the mesosoma orange-brown, but exceptionally largely dark brown females occur. Antennal segments of ♀ 30-34, of ♂ 36-39. Type of *M. affiniqades* differs from the European specimens in colour of the legs, the body is more extensively yellowish, and the pterostigma is completely yellowish. Length of ovipositor sheath 1.1 times length of metasoma. Vein r-m of fore wing may be absent ("var. *dubius* (Wesmael, 1835)" (e.g. part of the series from Madaira reared from *Chrysodeixis chalcites* (Esper, 1789) and a

female from Axel (Netherlands). The only other species of *Macrocentrus* with vein absent is the closely related Nearctic *M. incompletus* Muesebeck, 1932; it differs from *M. collaris* by the shorter vein 1-M of hind wing (about equal to vein 1r-m; in *M. collaris* is vein 1-M is much longer than vein 1r-m) and it has the head less transversal dorsal view.

Biology.— Reported to be a gregarious parasite of several species of Noctuid (Shenefelt, 1969). Comes frequently to light.

Distribution.— Palaearctic, known south to Israel and Yemen, and east to North Korea and Mongolia.

Macrocentrus crassus Eady & Clark, 1964 (figs 284-289)

Macrocentrus crassus Eady & Clark, 1964: 116, figs; Shenefelt, 1969: 151; Tobias, 1986: 257.

Material.— 1 ♀ (BMNH), paratype, examined.

Biology.— Unknown.

Distribution.— Italy.

Macrocentrus equalis Lyle, 1914 (figs 242, 243, 245-247)

Macrocentrus equalis Lyle, 1914: 261, figs; Watanabe, 1967: 8; Shenefelt, 1969: 152; Tobias, 1971[1972]: 103, 1976: 428, 1986: 253; Papp & Reichart, 1973: 366, 367, 370; Papp, 1980: 403; van Achterberg & Belokobylskij, 1987: 255, figs 52-56; Koponen, 1992: 197.

Material.— 1 ♀ (BMNH), "[Germany], *M. collaris* Ns.", "Ruthe Coll. 59.101", "*Macrocentrus equalis* Lyl ♀, det. J.A.J. Clark, 1964"; 3 ♀♀ + 5 ♂♂ (RMNH), "[Netherlands, no loc.], uit de pop van *Noct. ditrapezium* [= ex pupa of *Xestia (X.) ditrapezium* Denis & Schiffermüller, 1775].

Note.— The length of the ovipositor sheath is about 0.4 times fore wing, the fore wing is about 3.5 mm, the second submarginal cell of fore wing is very short, and the foretibial spur 0.3 times as long as forebasitarsus.

Biology.— Reported to be a gregarious parasite of Noctuidae: *Xestia triangulum* (Hufnagel, 1766) (Lyle, 1914), *X. ditrapezium* Denis & Schiffermüller, 1775 (see above) *Agrotis segetum* Denis & Schiffermüller, 1775 (Tobias, 1971[1975]), and *Orthotaenia undulana* (Denis & Schiffermüller, 1775) (Koponen, 1992).

Distribution.— U.K., Finland, Sweden, Germany, eastwards to Mongolia.

Macrocentrus flavus Snellen van Vollenhoven, 1878 (figs 146-160)

Macrocentrus flavus Snellen van Vollenhoven, 1878: 54, pl. 34, fig. 3, 3a-c; Shenefelt, 1969: 153; van Achterberg, 1982: 56-58, figs 1-15 (neotype designation); van Achterberg & Haeselbarth, 1983: 41. *Macrocentrus turanicus* Telenga, 1950: 299; Tobias, 1971[1975]: 103, 1976: 130, 1986: 258 (synonymized with *M. flavus*); van Achterberg, 1982: 58; van Achterberg & Haeselbarth, 1983: 41.