Revision of *Microterys* Thomson (Hymenoptera: Encyrtidae) of the MNCN including species distributed in Iberian Peninsula

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Abstract. *Microterys* Thomson species housed in Museo Nacional de Ciencias Naturales (MNCN) were studied. All *Microterys* species found in the Iberian Peninsula were examined except *Microterys cyanocephalus* (Dalman), which was not represented in MNCN. Two species, *M. zarina* (Walker) and *M. aeneiventris* (Walker), are rehabilitated in the genus *Microtery*s, which previously were transferred to the genus *Aschitus*. Two species (*M. hortulanus* Erdös and *M. notus* Sugonjaev) are recorded for the first time from the Iberian peninsula, and two species (*M. brachypterus* (Mercet) and *M. aeneiventris* (Walker)) for Austria. Two new species (*M. weyericus* **n. sp.** and *M. aldreyi* **n. sp.**) are also described. Five misidentified samples were found. A key to all 24 species in MNCN including Iberian peninsula species is provided.

Résumé. Révision des *Microterys* Thomson (Hymenoptera : Encyrtidae) du MNCN, y compris les espèces de la Péninsule Ibérique. Les espèces de *Microterys* Thomson conservées au Museo Nacional de Ciencias Naturales (MNCN) ont été étudiées ici. Toutes les espèces de *Microterys* trouvées dans la Péninsule Ibérique y ont été examinées à l'exception de *Microterys cyanocephalus* (Dalman), qui ne se trouve pas dans ce musée. Deux espèces, *M. zarina* (Walker) et *M. aeneiventris* (Walker), sont replacées dans le genre *Microtery*s, alors qu'elles avaient auparavant été transférées dans le genre *Aschitus*. Deux espèces, (*M. hortulanus* Erdös et *M. notus* Sugonjaev) sont notées pour la première fois de la Péninsule Ibérique, deux autres espèces (*M. brachypterus* (Mercet) et *M. aeneiventris* (Walker)) sont citées pour la première fois d'Autriche. Deux nouvelles espèces (*M. weyericus* **n. sp.** et *M. aldreyi* **n. sp.**) sont décrites. Cinq exemplaires mal identifiées ont été trouvés. Une clef des toutes les espèces du MNCN est fournie, y compris pour les espèces de la Péninsule ibérique.

Keywords: *Microterys*, MNCN, Morphology, Iberia, Encyrtidae.

The hymenopteran superfamily Chalcidoidea is one of the largest groups of insects, yet one of the most poorly known. The vast majority of included species are parasitoids of other insects and play an important role in their regulation. The genus *Microterys* Thomson 1876 (family Encyrtidae), includes species that are important parasitoids of scale insects and related groups, many of which are actual or potential pest species of agriculture worldwide. Some species of the genus *Microterys* (such as *Microterys clauseni* Compere 1926*, M. hortulanus* Erdös 1956*, M. sylvius* (Dalman 1820)*, M. bellae* Trjapitzin 1968 and *M. nietneri* (Motschulsky 1859) (Yasnosh & Japoshvili 1998; Japoshvili 1999; 2001; Karaca *et al.* 2003; Japoshvili *et al.* 2004; Japoshvili *et al.* 2008; Japoshvili *et al.* 2009) are already successfully applied in the biological control of economically important scale insects. In order to utilize the full potential of beneficial species it is essential to be able to identify them reliably. The primary objective of this research is to provide a major and detailed taxonomic revision of the Museo Nacional de Ciencias Naturales (MNCN) material of *Microterys*, belonging to the family Encyrtidae.

As many type species of *Microterys* were transferred and synonymised at first with the genus *Trichomasthus* Thomson (Trjapitzin 1964), and later with the genus *Aschitus* Mercet (Jensen 1989), so in my study I examined also *Aschitus and Trichomasthus* species housed in MNCN. This collection includes 8 types of *Microterys* and 2 types each of *Trichomasthus* and *Aschitus*, which it was also important to re-examine.

The first studies on species belonging now to *Microterys* appeared in Dalman's 1820 work, but the species were treated as *Encyrtus* Latreille spp. Later, in 1876, Thomson suggested the genus *Microterys*, but in Mercet's (1921) work most species placed in this genus were *Syrphophagus* Ashmead species. Later, from 1950-1980, this was corrected by Erdös (1957), Trjapitzin (1968) and Noyes (1981).

After 1921 only very fragmentary studies connected with the genus were done. In 1957 Erdös

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synonymised *Encyrtus consobrinus* Mercet 1921 with *M. tricoloricornis* (De Stefani 1886) and *M. matritensis* (Mercet) was offered by Noyes (1981) as **n. comb.** of *E. feudatarius* Mercet 1921. *M. calonotus* (Mercet 1921) was transferred to the genus *Trichomasthus* by Trjapitzin (1964); later this was supported by Noyes (1981). *M. zarina* (Walker 1837) was offered as **n. comb.** of *E. rogenhoferi* Mayr 1876 by Graham (1969) and later synonymised with *Trichomasthus rhizococci* Trjapitzin 1978 (Trjapitzin 1978). Trjapitzin (1989) suggested that *M. frontatus* (Mercet 1921) is a synonym of *M. nietneri* (Motschulsky 1859).

Only in 1976 Dr E. Sugonjaev (1976) tried to review the species of *Microterys* parasitiods of soft scales. It seems he limited his study only to parasitoids of soft scales, but in the genus there are parasitoids of Kermesids, Eriococcids, and some species have not been reared.

Later, in 1989 Dr P.B. Jensen studied the genera very close related to *Microterys - Aschitus* (Jensen 1989) and *Trichomasthus*, together with A. Sharkov (Jensen & Sharkov 1989). He moved several species of *Microterys* to *Aschitus* and synonymised some. According to his study *Microterys micropterus* (Mercet 1921) was synoymised with *Aschitus aeneventris* (Walker 1837); *M. calonotus* and *M. rogenhoferi* with *A. zarina*. Also some *Microterys* species were moved to the genus *Aschitus*. After this period no special study on the group was done, not taking into account the revision of Chinese *Miroterys* by Xu (2002). Only several new species of the genus were described by Simutnik (Simutnik *et al.* 2008) from Israel and one species by Japoshvili (Fallahzadeh & Japoshvili 2010).

Before our study, in the Iberian peninsula there were 13 species of *Microterys* and 6 species of *Aschitus* known. As there were many question marks between these two related genera plus *Trichomasthus* I decided to investigate types from the collection belonging to both genera plus *Trichomasthus*.

Table 1. List of *Microtery*s and other related species housed in NMCN or cited in the paper:

Species	Distribution in Iberian Peninsula
1. *M. aeneiventris* (Walker 1837)	+
2. *M. aldreyi* Japoshvili n. sp.	+
3. *M. amamiensis* Azim 1964	-
4. *M. bellae* Trjapitzin 1968	-
5. *M. brachypterus* (Mercet 1921)	+
5. *M. chalcostomus* (Dalman 1820)	+
6. *M. clauseni* Compere 1926	-
7. *M. cyanocephalus* (Dalman 1920)	+
8. *M. darevskii* Trjapitzin 1968	-
9. *M. dichrous* (Mercet 1921)	+
10. *M. dimorphus* (Mercet 1921)	+
11. *M. duplicatus* (Nees 1834)	+
12. *M. ericeri* Ishii 1923	-
13. *M. iranicus* Japoshvili 2010	-
14. *M. ferrugineus* (Nees 1834)	+
15. *M. feudatarius* (Mercet 1921)	+
16. *M. hortulanus* Erdös 1956	+
17. *M. kotinskyi* (Fullawey 1913)	-
18. *M. masii* Silvestri 1919	+
19. *M. matritensis* (Mercet 1921)	+
20. *M. mazzinini* Girault, 1917	-
21. *M. narzykulovi* Sharipov 1979	
22. *M. nietneri* (Motschulsky 1859)	+
23. *M. nikolskajae* Erdös 1955	-
24. *M. notus* Sugonjaev 1976	+
25. *M. problematicus* Hoffer 1977	-
26. *M. rufulus* (Mercet 1921)	+
27. *M. tesselatus* (Dalman 1820)	+
28. *M. tricoloricornis* (De Stefani 1886)	+
29. *M. sylvius* (Dalman 1820)	+
30. *M. weyericus* Japoshvili n. sp.	-
31. *M. zarina* (Walker 1837)	+
32. *Aschitus algiricus* Ferriere 1956	-
33. *A. bicolor* (Mercet 1921)	+
34. *A. hofferi* Jensen 1989	-
35. *A. incertus* Mercet 1921	+
36. *Trichomasthus coeruleus* Mercet 1923	+

Material and Methods

I revised all types housed in MNCN and I checked material in alcohol. From alcohol material, 82 tubes with Encyrtidae species were examined and encyrtids were separated from 3 tubes (with more then 10 000 specimens of Hymenoptera collected by Malaise trap) . Only 3 specimens of *Microterys* were found. I re-measured and re-described more then 55 samples of 24 species of *Microterys*, 1 *Trichomasthus* and 2 *Aschitus*. All 36 species examined are given in Table 1. One species, *Microterys cyanocephalus* (Dalman), which was recorded from Spain by Peck (1963), was not represented in MNCN. I limited my study only to MNCN types and collection material and did not include in this my personal collection material or material from other collections. All other results about related species and genera will be done in future studies.

Based on my personal experience I conclude that the number of characters is not important, more important is the value of characters. At the same time it's too hard to measure all sides and positions of singleton types and we have to limit by the characters which it is possible to find. As my study was mostly based on the study of very old types of Mercet I used characters which could be measured and used for morphological classification of the genus. These characters were chosen after long term observations on encyrtids and most of them are used in species keys. Slides were made according to the protocol of Noyes (2009).

The following abbreviations are used in the text: AOL, distance between posterior and anterior ocelli; EL, eye length; F_1, F_2, etc., flagellar first segment, flagellar second segment, etc.; FVL, frontovertex length; FVW, frontovertex width; HH, head height; HW, head width; MS, malar space length; OCL, occipital ocellar line (distance of posterior ocellus from occipital margin); OD, longest diameter of ocellus; OOL, ocular–ocellar line (shortest distance between posterior ocellus and adjacent eye margin); POL, posterior ocellar line (the shortest distance between the posterior ocelli); Also MNCN for National Museum of Natural History in Madrid, Spain.

I made more than 100 Scanning Electronic Microscope (SEM) photos, which helped me to make my conclusions. Also I made more than 100 photos by Canon Power shot 95 photos from a Stereo Microscope. I also made slides and photos using Microscope Hirox KH-7700. Coordinates are given according to National Geospatial-Intelligence Agency website.

Results

Microterys Thomson 1876

Sceptrophorus Foerster 1856: 34. Type-species: *Encyrtus sceptriger* Foerster 1856, by designation of Ashmead (1900:381) [Suppressed in favour of *Microterys* Thomson 1876: Opinions Decl. Int. Comm. zool. Nomencl. 35:99-100].

Microterys Thomson 1876: 155. Type-species: *Encyrtus sylvius* Dalman 1820, by designation of Ashmead 1900

Apentelicus Fullaway 1913:26. Type-species: *Apentelicus kotinskyi* Fullaway 1913

Paraphaenodiscoides Mercet 1921:380. Type-species: *Paraphaenodiscoides dimorphus* Mercet 1921.

Birous Erdos & Nowicky 1955:196. Type-species: *Birous anomalus* Erdos & Nowicky 1955.

Diagnosis. Body yellow to dark brown, with usually metallic violet, green, blue, golden or silver reflection. Antenna often with funicle various coloured. Fore wings with infuscation often with 0–2 hyaline bands. A few of species have entirely hyaline wings. Maxillary and labial palpi 4 and 3 segmented respectively. Mandibles tridentate or with 2 teeth and 1 truncation. Mesoscutum without parapsidal lines. Marginal vein well developed. Ovipositor with third valvula freely articulating with second valvifer.

Hosts. Mainly soft scales (Hemiptera: Coccidae), also some Kermesidae, Pseudococcidae and Eriococcidae.

Key to *Microterys* species of Iberian Peninsula (with some additional material from MNCN)

1. Brachypterous **2**
- Wings developed normaly **5**
2. Ovipositor exserted and exserted part more than 0.3× as long as gaster ..... ***amamiensis* Azim**
- Ovipositor if exserted then not more than 0.15× as long as gaster **3**
3. Body all dark brown, mesopleuron dark, ovipositor exserted ..... ***zarina* (Walker)**
- Mesopleuron yellow or dirty yellow, ovipositor not exserted **4**
4. Head width less than 1.8× as long as scape, FV almost 6× diameter of ocellus, mesoscutum and scutellum dirty yellow ..... ***brachypterus* (Mercet)**
- Head more than 1.8× as long as scape, FV not more than 5× diameter of ocellus, mesoscutum and scutellum light yellow ..... ***aeneiventris* (Walker)**
5. Fore wing hyaline without infuscation ..... ***weyericus* Japoshvili n. sp.**
- Fore wing at least with some infuscation **6**
6. Fore wing with one light band or apical part hyaline ... **7**
- Fore wing with two light bands, sometimes bands interrupted by infuscation **17**
7. Mesopleuron dark brown, almost black..... **8**
- Mesopleuron yellow, at most dirty yellow **10**
8. Head width not less than 5× as wide as FV, scape dark brown..... ***chalcostomus* (Dalman)**
- Head width not more than 4× as wide as FV, scape yellow **9**
9. Scape more than 4× as long as wide, FV more than 3× as wide as scape ..... ***dimorphus* (Mercet)**
- Scape less than 4× as long as wide, FV not more than 2× as wide as scape ..... ***feudatarius* (Mercet)**
10. Head width not more than 3× and FV more than 6× diameter of ocellus ..... ***ferrugineus* (Nees)**
- Head width at least 4× FV and FV not more than 4.5× diameter of ocellus, ovipositor not exserted. **11**
11. Mesoscutum and scutellum dark, almost black with metallic reflection **12**
- Mesoscutum and scutellum at most dirty yellow **16**
12. Head width much less than 5× FV ..... ***dichrous* (Mercet)**
- Head width at least 5× FV **13**
13. Scape all dark brown ..... ***sylvius* (Dalman)**
- Scape with only dark band on the dorsal side, rest yellow..... **14**
14. Head width 2× length of scape, ovipositor exserted, clearly visible ..... ***notus* Sugonjaev**
- Head width at least 2.5× length of scape, ovipositor if exserted than hardly noticeable **15**
15. FV more than 1.5 as wide as scape width and less than 4× diameter of ocellus, ovipositor not exserted ..... ***masii* Silvestri**
- FV less than 1.5 as wide as scape width and more than 4× diameter of ocellus, ovipositor hardly exserted ..... ***hortulanus* Erdös**
16. Flagellum with F5-6 white, ovipositor exserted, AOL longer than POL ..... ***matritensis* (Mercet)**
- Flagellum unicolored, ovipositor not exserted, AOL at most as long as POL ..... ***aldreyi* Japoshvili n. sp.**
17. Mesopleuron dark brown with metallic reflection **18**
- Mesopleuron yellow or at most dirty yellow **19**
18. Ovipositor exserted, mesoscutum and scutellum dirty yellow or light brown ..... ***ericeri* Ishii**
- Ovipositor not exserted, mesoscutum and scutellum dark brown almost black with metallic reflection ..... ***tessellatus* (Dalman)**
19. Head width not more than 3.6× as wide as FV, AOL at most as long as POL, FV at least 1.5× scape width **20**
- Head width not less than 4× as wide as FV, AOL well longer than POL, FV less than 1.5× scape width **21**
20. Ovipositor not exserted, flagellum unicolored ..... ***rufulus* (Mercet)**
- Ovipositor exserted, F6 dark brown ..... ***mazzini* Girault**
21. Head width more than 5.5x as wide as FV, AOL at least 2× as long as POL **22**

- Head width at most 5.5× as wide as FV, AOL at most 1.5× as long as POL **23**

22. Apical dark band of fore wing connected with central transverse dark band, head width almost 3× diameter of ocellus ..... ***nietneri*** **(Motschulsky)**
- Apical dark band of fore wing not connected with central transverse dark band, head width almost 2× diameter of ocellus ..... ***kotinskyi*** **(Fullaway)**

23. Mesoscutum and scutellum dark brown, almost black in the middle, with metallic reflection, only sides dirty yellow, head width at most 5× as wide as FV, FV more than 3× diameter of ocellus ..... ***duplicatus*** **(Nees)**
- Mesoscutum and scutellum at most all dirty yellow, head width more than 5× as wide as FV, FV at most 3× diameter of ocellus ..... ***tricoloricornis*** **(De Stefani)**

Comment. *Microterys cyanocephalus* (Dalman 1820) was recorded from Spain by Peck(1963), however we could not find any specimens in the collection and did not include it in our studies.

List of *Microtery*s species housed in NMCN

1. *M. aeneiventris* (Walker 1837)

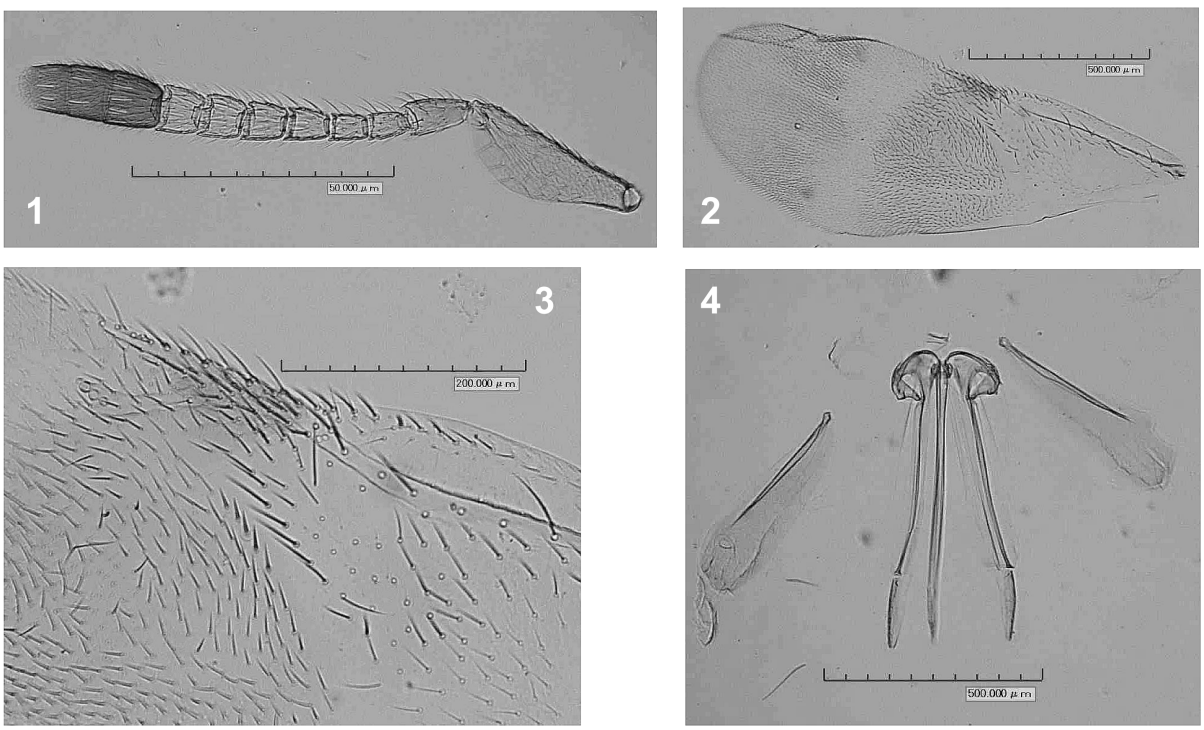
Encyrtus aeneiventris Walker 1837:447
Encyrtus micropterus Mercet 1921: 707-708
Metallon usticorne Erdös 1955: 195

Material examined. Lectotype of *E. micropterus* 1♀, Spain, Santander, Solares [43°23'00"N 003°44'00"W], Mercet; 1♀, Pachberg, 23.VIII.1915, Mercet; With label *M. adustus* Ruschka; 1♀, Leitha-Geb. Vimpacs, 15.VIII.1915, Mercet; 1♀, Austria, Weyer, 15.VIII. 1918, Mercet.

Comments. Samples with label *M. adustus* Ruschka. It must be noted that *M. adustus* or *Encyrtus adustus* are nomen nudum. *M. micropterus* was synonymised by Jensen (1989) with *A. aeneiventris*, and *A. aeneiventris* is discussed as n. comb. of *M. aeneiventris*. But in 1993 when Trjapitzin visited MNCN he checked the species and gave a label with the name *M. micropterus*, which means that he disagreed with the earlier synonymisation, but after my studies this species must be discussed as a synonym of *M. aeneiventris* (see discussion). This species is new for the Austrian parasitoid fauna.

2. *M. aldreyi* Japoshvili n. sp.

Female holotype. Length 1.64 mm. Head and all body yellow. Only gaster in the middle and apical part, around pygostyles slightly darker. Scape, pedicel yellow, but scape with brown band on the ventral surface, flagellum starting from F_1 yellow and step by step lightening and F_6 almost white. Clava brown. Mesoscutum with violet-golden metallic reflection. Legs yellow.



Figures 1–4
Microterys aldreyi **sp. n.**, ♀. **1,** Antenna; **2,** Fore wing; **3,** Venation of fore wing; **4,** Ovipositor.

Table 2. Differences between *M. aldreyi* **sp. n.**, *Microterys darevskii* Trjapitzin 1968 and *Microterys iranicus* Japoshvili 2010.

***M. aldreyi* sp.n.**	***M. darevskii***	***M. iranicus***
FV not more than 2× as long as wide	FV slightly more than 2× as long as wide	FV slightly more than 2× as long as wide
Malar space 0.7× as long as eye length	Malar space 0.6× as long as eye length	Malar space 0.6× as long as eye length
Mesoscutum at most 1.7× as wide as long	Mesoscutum 2× as wide as long	Mesoscutum 1.35× as wide as long
Outer plates 3.27× as long as wide	Outer plate 4× as long as wide	Outer plate 3.5× as long as wide
F_{5-6} unicolored yellow	F_{5-6} lighter than remaining flagellar segments	F_{4-6} lighter than remaining flagellar segments
Hind tibia unicolored yellow	Hind tibia with two ring-like bands	Hind tibia unicolored yellow

Head about 1.14×as wide as high and about 3.86× as wide as FV; FV in dorsal view almost 1.5× as long as wide. OOL almost 3× shorter then OCL and 2.65× shorter then OD respectively. Ocelli forming slightly obtuse triangle. Scape 3× as long as wide; F_1 0.625× as long as pedicel and 1.43× as long as wide. F_2 as F_1. F_3 – 1.375×, F_4 – 1.1×, F_5 – 1×, F_6 – 0.92× as long as wide respectively. F_3, F_4, F_5, F_6 equal in length. Clava 4.14× as long as wide (Fig.1). Toruli separated from each other by 1.7× and from clypeal margin 0.8× their maximum diameter. Upper margin of toruli as down from eye lowest margin as maximum diameter of toruli. Relative measurements: HH 919; HW 1046.8; FVL 411.8; FVW 271; OD 56.5; POL 100; OCL 64.8; AOL 75.5; MS 406; EL 583.

Mesoscutum and scutellum flat, scutellum very slightly longer then wide (1.02×), mesoscutum 1.58× as wide as long. Fore wing 2.5× as long as wide (Fig.2,3). Marginal vein and stigmal vein equal in length and slightly longer then postmarginal (9:9:8). Band on fore wing occupying 0.13× as long as fore wing length. Outer plates of ovipositor 3.27× as long as wide. Third valvifer 4.24× as long as ovipositor and 2.97× as long as outer plate (Fig. 4). Ovipositor not exserted.

Variation: FV 1.5–2× as long as wide. Scape 2.5-3.33× as long as wide. Head 3.86–4.5× as wide as FVW.

Male: Not known.

Material examined. Holotype: 1♀, ex *Nidularia pulvinata* (Planchon) (Eriococcidae), Mercet, Paratypes: 2♀♀, Madrid [40°30'00"N 003°40'00"W], Mercet. Holotype and Paratypes in MNCN.

Etymology. The species is named in honor of the well known cynipid taxonomist Jose Luis Nieves Aldrey (MNCN, Madrid, Spain).

3. *M. amamiensis* Azim 1964

Microterys amamiensis Azim 1964:11

Material examined. 1♀, Japan, Nagasaki, Ex *Ceroplastes rubens*.

Comment. V. Trjapitzin determined it as *M.* sp. in 1993.

4. *M. brachypterus* (Mercet 1921)

Encyrtus brachypterus Mercet 1921: 411

Material examined. 2♀♀, Austria, Weyer; 1♀, Leithe-Geb. Vimpacs, 20.VII.1915.

Comment. There was no type in the collection. Specimens were labeled *M. custos* Fast. and *E. custos* Fast, but both are nomina nuda. This species is new for the Austrian parasitoid fauna.

5. *M. chalcostomus* (Dalman 1820)

Encyrtus chalcostomus Dalman 1820:342

Material examined. 1♀, Spain, Segovia, Barrido, 21.VIII.1995, F.M. Fontal; 1♀, La Granja, C. Bolicar; 1♀, Budapest, IX.1913, Biro; 1♀, Madrid, La hiruela, Morra de la dehessa, Barrido abedules, 9.VIII.1994, F.M. Fontal.

Comment. Fontal determined it as *M. sylvius*. The species is very closely related to *M. sylvius* but differs from the latter by the characters given in table 3.

6. *M. dichrous* (Mercet 1921)

Encyrtus dichrous Mercet 1921:405

Material examined. Lectotype. 1♂, Madrid [40°30'00"N 003°40'00" W], Mercet; Paralectotype. 1♀.

7. *M. dimorphus* (Mercet 1921)

Paraphaenodiscoides dimorphus Mercet 1921:380

Material examined. Lectotype. 1♀, Ona [42°44'00"N 003°24'00"W], Ceballos, Mercet; Paralectotypes1♀, Madrid, C. Bolivar; 2♀♀, 2♂♂, G. Mercet; some additional material: 1♀, Spain, Madrid, El Pardo (El Goloso), Malaise Trap, 17-23.IX.1991, Nieves & Rey; 1♀, Mostoles.

8. *M. duplicatus* (Nees 1834)

Encyrtus duplicatus Nees 1834:204

Material examined. 1♀, El Pardo; 1♀, V.delruelas (Ceballas); 1♀, Jaen, 12.VIII. 1916; 1♀, Bussaco, 25.VI.1921; 1♀, Gerona, Mercet; 2♀♀, Jaen, Mercet; 2♀♀, Madrid, Coleccion; 1♀, Tenerifem La Esperanca, Pinor, 15.XI.1902.

9. *M. ericeri* Ishii, 1923

Miroterys ericeri Ishii 1923:109

Material examined. 1♀, Japan, Nagasaki, ex eicerus pe-la.

Table 3. Character differences between *M. chalcostomus* and *M. sylvius* based on Iberian material.

M. chalcostomus	***M. sylvius***
Mesopleuron dark brown	Mesopleuron yellow, at most dark yellow
AOL>POL	AOL<POL
HW 6× as wide as FV	HW at most 5× as wide as FV

10. *M. ferrugineus* (Nees 1834)

Encyrtus ferrugineus Nees 1834:205

Material examined. 1♀, El Escorial, G. Mercet; 1♀, Germany, G. Mayr.

11. *M. feudatarius* (Mercet 1921)

Encyrtus feudatarius Mercet 1921:403

Material examined. Paratype, 1♀, Sallent [42°11'00"N 001°14'00"E], Mercet.

Comments. J. Noyes labeled this as *M. feudatarius* in 1978, later, in 1993, Trjapitzin determined it also as *M. feudatarius.* The species was synonymised with *A. matritensis*, which was offered as a new combination of *M. matritensis,* by Jensen (1989). After careful examination I found several good characters distinguishing these two species. See table 4.

12. *M. hortulanus* Erdös 1956

Microterys hortulanus Erdös 1956:379-381

Material examined. 1♀, Valencia, Spain

Comment. This species was misidentified as *M. masii*. This species is new for Spain.

13. *M. kotinskyi* (Fullaway 1913)

Apentelicus kotinskyi Fullaway 1913:25

Material examined. 1♀, Hawaii, Honolulu, ex *Saissetia nigra*.

14. *M. masii* Silvestri 1919

Microterys masii Silvestri 1919:120-124

Material examined. 1♀, Tunisia P. Marchal, ex Saissetia olea; 1♀, Valencia, Guilis; 1♀, Escoreal, Coleccion, Cabrera.

15. *M. matritensis* (Mercet 1921)

Encyrtus matritensis Mercet 1921:403

Lectotype,1♀, Vaciamadrid [40°20'00"N 003°31'00"W], Mercet; 1♀, Vaciamadrid, Mercet.

Comments. This species was labeled as *M. nikolskajaee* by P. Bode Jensen in 1984, however this species is identical to the lectotype of *M. matritensis.* See also comments under *M. feudatarius.*

Table 4. Differences between *M. feudatarius* and *M. matritensis.*

M. feudatarius	*M. matritensis*
FVW/OD = 5.33	FVW/OD ≈ 8–10
FVL/FVW = 1.78	FVL/FVW = 2
Mesoscutum and scutellum dark brown Mesopleuron dark	dark yellow Mesopleuron yellow
P almost 2× as long as F1	distinctly less than 2× as long as F1

16. *M. mazzinini* Girault 1917

Material examined. 1♀, Label illegible 9.V. 1912.

17. *M. nietneri* (Motschulsky 1859)

Encyrtus nietneri Motschulsky 1859:170
Encyrtus flavus Howard 1881:367
Encyrtus frontatus Mercet 1921:413

Material examined. Lectotypes, 1♀, 1♂, Fuenterrabia [43°22'00"N 001°47'00"W]; also 1♀, Madrid, ex *C. hesperidum*, G.Mercet; 1♀, Barcelona, Mercet; 3♂♂, Solares, Mercet; 1♀, Tenerife, Agua-Garcia, 2.VII.1922, Cabrera.

18. *M. notus* Sugonjaev 1976

Microterys notus Sugonjaev, 1976:920

Material examined. 1♀, Spain, Madrid, La Hiruela, 1200 m, Morra de la Dehesa, Barrido abedules, 09.VIII.1994, F.M. Fontal.

Comment. Misidentified as *M. hortulanus* Erdös by Fontal. This species is new for Spain.

19. *M. rufulus* (Mercet 1921)

Encyrtus rufulus Mercet 1921:415-417

Material examined. Lectotype, 1♀, Cercedilla [40°44'00"N 004°04'00"W], Bolivar; also 1♀, Vaciamadrid, C. Bolivar; 1♀, Vaciamadrid, Mercet.

20. *M. tesselatus* (Dalman 1820)

Encyrtus tessellates Dalman 1820:
Encyrtus cyanocephalus obscuricornis Mercet:1921:425

Material examined. Paralectotype of *E. cyanocephalus obscuricornis* 1♀, Benasque [42°36'00"N 000°32'00"E]; 1♀, Bilbao, Mercet; 1♀, Madrid, El Ventorrillo, 1480m, Malaise Trap, 16-22.VI.1989, Nieves & Rey.

21. *M. tricoloricornis* (De Stefani 1886)

Encyrtus tricoloricornis De Stefani 1886:2
Encyrtus consobrinus Mercet 1921:709

Material examined. Lectotype, 1♀, El Pardo, Mercet; Paralectotype, 1♀, El Pardo, Mercet.

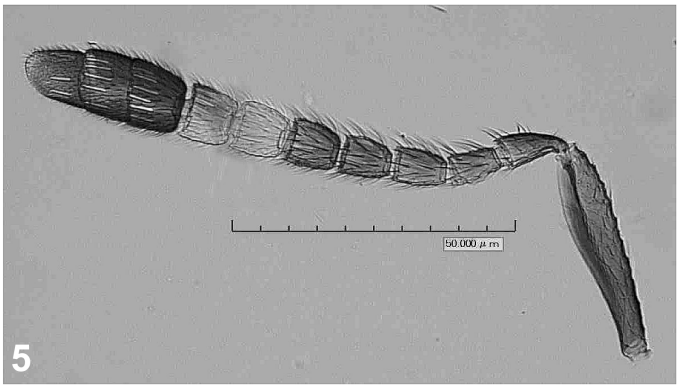
22. *M. sylvius* (Dalman 1820)

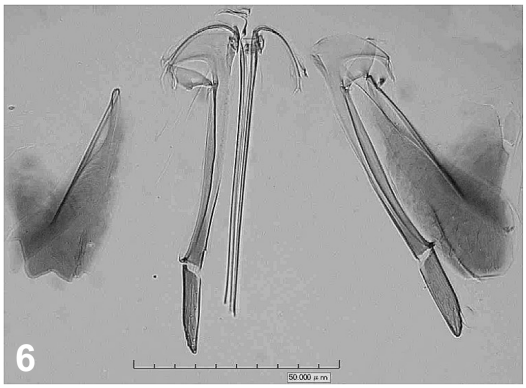
Encyrtus sylvius Dalman 1820:154
Encyrtus zephyrinus Dalman 1820:167forewing

Material examined. 1♀, 8.VIII.1912, Timberlake lector 46548; 1♀, Spain, Madrid, El Ventorillo, 1480m, VI.1988, Nieves and Rey; 1♀, La Granja, Bolivar; 1♀, El Ventorrillo, Madrid, Malaise Trap, 21-30.VIII.1988; 1♀, Espana, Madrid Robregordo, Barido, 21.VIII.1995, F.M. Fontal.

23. *M. weyericus* Japoshvili n. sp.

Female holotype. Length 1.24 mm. All body dark brown.





Figures 5–6
Microterys weyericus **sp. n.**, ♀. **5,** Antenna; **6,** Ovipositor.

Head and thorax with slightly blue-silver metallic reflection. Masopleuron with green-violet-golden metallic reflection. Gaster with green-golden metallic reflection. Legs, scape, pedicel, F_{1-4} light brown F_6 from some sides can be also light brown. Hind femora dark brown, with somewhat golden-violet metallic reflection. F_5 white and F_6 also from some aspects seems white. Clava dark brown.

Head about 1.23× as wide as high and about 4.56× as wide as FV; FV in dorsal view almost 1.27× as long as wide. OOL almost 2× shorter then OCL and 2× shorter then OD respectively. Ocelli forming acute triangle. Scape 4.5× as long as wide; F_1 0.75× as long as pedicel and 1.5× as long as wide. F_2–1.33×, F_3–1.2x, F_4–1.18×, F_5–1×, F_6–0.93× as long as wide respectively. F_1, F_2, F_3 equal in length and F_4, F_5, F_6 equal in length. Clava 2.5× as long as wide (Fig. 5). Toruli separated from each other by 1.36× and from clypeal margin 0.57× their maximum diameter. Upper margin of toruli below lower margin of eye by 0.64 length of maximum diameter of toruli. Relative measurement: HH 883.3; HW 1088.6; FVL 303.1; FVW 238.8; OD 74; POL 222; OCL 144; AOL 296; MS 271; EL 572.

Mesoscutum and scutellum flat, scutellum 1.25× as long as mesoscutum. and as long as wide. Mesoscutum 2.25× as wide as long. fore wing 2.5× as long as wide. Stigmal vein very slightly shorter then Marginal. Postmarginal almost 0.5× as long as marginal (7:8:4). Fore wing completely hyaline. Outer plates of ovipositor 2.76× as long as wide (Fig. 6). Third valvifer 3.67× as long as ovipositor and 2.67× as long as outer plate. Ovipositor not exserted.

Variation: OOL almost 2–3× shorter then OCL and 2–3× shorter then OD respectively. FV 1.27–2x as long as wide. Scape 3.4–4.5× as long as wide. Head wide 4.4–4.56× as wide as FVW.

Male: Not known.

Material examined: Holotype. 1♀, 2.VIII.1918, Weyer [47°16'00"N 012°19'00"E], Austria. Paratypes. 2♀♀, 2.VIII.1918, Weyer, Austria. Holotype and Paratypes in MNCN.

Comment. In collection misidentified as *M. rogenhoferi.* This new species is very close to *M. narzykulovi* Sharipov 1979 and *M. problematicus* Hoffer 1977 so I provide a table distinguishing these species (Tab. 5).

This species is very close also to *M. problematicus* but differs by the following characters (Tab. 6).

24. *M. zarina* (Walker, 1837) (=*M. calonotus* Mercet)

Encyrtus zarina Walker 1837:447
Encyrtus rogenhoferi Mayr 1876:707
Encyrtus calonotus Mercet 1921:706
Trichomasthus rhizococci Trjapitzin 1978:285

Material examined. Lectotype, 1♀, Santander, Solares [43°23'00"N 003°44'00"W], Mercet; Also 1♀, Leitha-Gebi, Vimpacs, 20.VIII.1915, Mercet; 1♀, Seigenfeld, 27.VIII.1915, Mercet; 1♀, Bockilub, 9.VI.1916, Mercet.

Table 5. Differences between *M. weyericus* **sp.n.** and *M. narzykulovi* Sharipov 1979.

***M. weyericus* sp.n.**	***M. narzykulovi***
Fore wings hyaline	Fore wings with dark infuscation and with 1 light band.
Marginal longer than portmarginal	Marginal as long as postmarginal
Outer plates of ovipositor	3.5× as long as wide
Body dark brown with metallic reflection	Body and head yellowish-brown

Table 6. Differences between *M. weyericus* **sp. n.** and *M. problematicus*.

***M. weyericus* sp.n.**	***M. problematicus***
Fore wings hyaline	Fore wings with dark infuscation and with 1 light band.
Thorax all dark brown	Thorax yellowish brown
F1 1.5× as long as wide	F1 2.5× as long as wide
1.13	Thorax 1.25 as long as gaster*
FVW not more than 5× as long as OD	FVW not more than 6× as long as OD

* Trjapitzin built his key probably based on the original description of *M. problematicus* when he stated that F1 2.5× as long as wide, however by slide drawing F1 is at most 1.5× as long as wide.

Discussion

After careful study of material and after analyzing all the images, I agree that *Microterys calonotus* and *M. micropterus* must be considered as *M. zarina* and *M. aeneiventris* respectively. These two species differ from each other by the exserted part of the ovipositor. However, a *M. micropterus* paratype from MNCN, according to Trjapitzin's (1989) key out as *M. degeneratus* Ishii 1928 and with Jensen's (1989) key to *Aschitus hofferi* Jensen 1989, and at the same time Jensen does not include the brachypterous form of *A. aeneiventris* in the key. The lectotype of *M. micropterus* from MNCN keys out in Trjapitzin's key to *Microterys nikolskajae* Erdös 1955 and with Jensen's key to *A. hofferi*. So I came to the conclusion that both authors in their keys are using characters which are not informative for this species identification and lead mentioned species to wrong direction. Key in the presented study is giving best result for this species identification.

Specimens in the collection under *M. rogenhoferi*, which was later synonymised with *A. zarina*, are definitely not *A. zarina*. However, in the key Jensen is distinguishing winged forms (probably *rogenhoferi*) by the exserted part of the ovipositor, which is mentioned neither in the key nor in the description of species. Also there is no any information on how many brachypterous and how many macropterous samples of this species were investigated, which gives me more support to think that some conclusions were erroneous.

Microterys matritensis and *M. feudatarius* are truly synonyms, but the species determined as *M. nikolskajae* belongs to those two in its turn. *M. nikolskajae* can be a junior synonym and this needs study of the types of *M. nikolskajae*.

Jensen (1989) states that a number of species currently placed in *Microterys* or *Paraphaenodiscus* were congeneric with *Aschitus incertus* Mercet 1921. This sentence means that all congeneric genera can be synonymised with one. Also the definition of this term "congeneric" and treatment of it changes from one taxonomist to another. I examined the type of *Aschitus incertus* and came to the conclusion that species, earlier moved from *Microterys* to *Aschitus* by Jensen, must be returned back and molecular study is recommended and molecular studies in its turn is very problematic, as it is almost imposible to make this kind of study on types. Jensen (1989) did not mention *A. bicolor* (Mercet 1921) and *A. algiricus* (Ferriere 1956) in his studies, however these are good species to be used for distinguishing *Microterys* and *Aschitus* species as well.

Finally we must note that *Aschitus* and *Trichomasthus* insignificantly differ from *Microterys* and there are species overlapping all these genera. So I think that future studies will show that *Aschitus* and *Trichomasthus* can be discussed as *Microterys* synonyms. In future, full study including all these related genera is planned.

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