

## A NEW SPECIES OF *MEGASTIGMUS* (HYMENOPTERA: TORYMIDAE: MEGASTIGMINAE) FROM UŞAK, TURKEY

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ABSTRACT: In this paper a new parasitoid *Megastigmus* Dalman, 1820 (Hymenoptera: Chalcidoidea: Torymidae: Megastigminae) species, *M. usakensis* sp. nov., was described from Uşak, Turkey.

KEY WORDS: New species, Chalcidoidea, Uşak, Turkey

*Megastigmus* (Hymenoptera: Chalcidoidea: Torymidae) was described by Dalman (1820) as the subgenus *Torymus* Dalman with its type species being *Pteromalus bipunctatus* Swederus, 1795. Later, *Megastigmus* was recorded as a valid genus by several authors (Curtis, 1829; Walker, 1833; Dalla-Torre, 1898; Ashmead, 1900, 1904). Crosby (1913) designated its type species as *P. bipunctatus*. Boucek (1988) keyed out *Megastigmus* in the Subfamily Megastigminae, and provided the diagnostic characters of the genus, stated that the genus contains 44 species in Australia, 35 spp. from Holarctic region in America south only to Mexico, but about 3 spp. are present in the Old World in eastern and southern Africa, while South Asia has at least 15 spp., and 1 species is found on Fiji. Grissell (1999) listed 133 world species with 5 subspecies of *Megastigmus* including 9 species of *Bootanomyia*, and gave their synonyms, distributions and literature references, and stated that 19 keys to the species of *Megastigmus* were provided by several authors in the world. In the last two decades some more species of *Megastigmus* were described (Xu & He, 1995; Xu et al., 1998; Roques & Skrzypczynska, 2003; Grissell, 2006; Doğanlar & Hassan, 2010; Doğanlar et al., 2013; Doğanlar, 2015; Roques et al., 2016; Doğanlar et al., 2017). Noyes (2017) listed 154 world species of *Megastigmus*, 5 of them as unavailable name in current taxon, and gave their synonyms, distributions and literature lists.

Up to now, 8 species of *Megastigmus* have been recorded from Turkey by several works (Novicky, 1954; Hussey, 1957; Lessmann, 1962; Öncüer, 1991; Fabre et al., 1994; Roques et al., 1999; Gencer, 2003; Roques & Skrzypczynska, 2003; Auger-Rozenberg et al., 2006; Daneshvar, 2009; Ayberk & Cebeci, 2010; Doganlar & Doganlar, 2010; Stojanova, 2012). Recently, the specimen of *Megastigmus* sp. was obtained from pane trap in the orchard of mixed trees of apple, pear and cherry in Uşak, Turkey. It was sent to the first author for identification, and it was described as a new species for science.

### MATERIAL AND METHOD

The type specimen of the new species was obtained from pane trap in the orchard of mixed trees of apple, pear and cherry in Uşak, Turkey.

Morphological terminology follows Roques & Skrzypczynska (2003), Doğanlar & Hassan (2010) and Doğanlar (2015).

The left antenna of the holotype was slide-mounted in Canada balsam. The holotype of the new species was deposited in Insect Museum of Biological Control Station, Yüreğir, Adana, Turkey (IMBC). Photographs of diagnostic characters of the new species were taken by using of Leica DM 500 microscopes with a digital Leica ICC 50 camera attached to it.

## RESULTS AND DISCUSSION

### *Megastigmus usakensis* sp. nov.

(Figs. 1a-h)

**Description of Female.** Length (body+ ovipositor): 1.88 + 0.5 mm. Colour: Body (Fig. 1a) yellow, except occiput, metasoma dorsally tan, ovipositor sheaths black and ovipositor brown. Wigs hyaline, veins white, except apical part of prestigma, tips of marginal vein, stigma and area blow stigma, as long as length of stigma, black; antennae three colorized, scape yellow in  $\frac{3}{4}$  basally and testaceous apically, pedicel yellow, anelli, F4 and club white, F1-F3 pale testaceous, F5 testaceous, F6 and F7 black. Pilosity of body black, Legs almost white, except pretarsi black.

**Morphology:** Head (Figs. 1a-d) with fine transverse striae, face almost smooth. Antennae inserted slightly above lower ocular line. Relative measurements: head dorsally about twice as wide as long; in lateral view 1.32x as height as dorsal length ; frons width 2.54x eye width in frontal view; POL 2x OOL=MOL, Odia.  $\frac{1}{2}$  OOL, eye 1.28x as long as width; malar space 0.46x as long as width; anterior margin of clypeus slightly incised. Antennae (Fig. 1a,e) clavate, flagellar segments F1-F4 longer than width, F1- F3 in same length, F1 2x, F2-F3 1.75x as long as width; F4 slightly wider and shorter than preceding segments, 1.33 × longer than width, F5-F7 distinctly wider than preceding segments, almost same length, F5 1.08x, F6 slightly transverse, 0.86x as long as width, F7 distinctly transverse, as long as width; combined length of flagellum with pedicellus slightly shorter than width of head (12:13) and 2.35x transverse diameter of eye. Scape with 2-3 rows of setae dorsally, nearly cylindrical, distinctly broader medially, with distinct, deep cavity in frontal side, 5x as long as width, and slightly longer than transverse diameter of eye. Pedicel 2.25x as long as width, 1.12x as long as anelli plus F1. Club 0.9x as long as 3 preceding segments combined, 2x as long as width, ventrally without micropilosity. Sensillae on flagellum long and sparse, with 2-3 longitudinal linear sensillae in a row.

Mesosoma (Fig. 1a) 1.62 × as long as mesoscutum width, and as wide as height; pronotum about 1.5 × as wide as long; mesonotum about 0.8x × as long as width, with fine transverse striae, 3 pairs of setae, along deep notauli; scutellum (Figs. 1g,f) as long as broad, with fine reticulation, frenal groove distinct, fraenum almost smooth, 0.58x as long as scutellum, hind margin of scutellum distinctly carinate; scutellum with 2 pairs of setae on each side; axillae longitudinally striate, with 1 seta. Forewing (Fig. 1h) 2.36 × as long as broad, costal cell with one complete row and in apical half a second row of setae, speculum broad, closed below, basal and cubital veins with 5-6 hairs, basal cell almost bare, closed, with a row of minute setae in basal half. Stigma almost as long as width, petiolate, stigmal vein 1.2x as long as width. Relative measurements of forewing: costal cell 47: 6; parastigma 17, marginal vein 28, post marginal vein 28, stigmal vein 3, stigma (l: w) 8: 8.5, uncus 3. Hind wing 4.4 × as

long as broad. Hind coxae dorsally carinate, with 3-4 setae. Propodeum (Fig. 1g)  $0.77 \times$  as long as scutellum, about  $0.68x$  as long as distance between inner edges of spiracles, median carina absent, plicae complete, finely reticulated, spiracles distinctly separated from posterior margin of metanotum, callus with 7-8 fine setae.

Metasoma (Fig. 1a) with distinct petiole, almost as long as mesosoma, broad,  $2x$  as long as broad, its dorsal surface smooth. Ovipositor sheath  $0.56 \times$  as long as metasoma and  $1.3x$  as long as hind tibia.

**Male:** Unknown.

**Material Examined:** HOLOTYPE female. TURKEY, Uşak, Banaz, Bağkonak village,  $38^{\circ} 44' 47''$  N,  $29^{\circ} 45' 42''$  E, 29. IX. 2017, leg. E. Zengin, taken from pan trap, in the orchard mixed with apple, plum and pear trees. Type of the new species was deposited in Insect Museum of Biological Control Station, Yüreğir, Adana, Turkey (IMBC).

**Host:** Unknown.

**Distribution.** Turkey: Uşak.

**Remarks.** *Megastigmus usakensis* sp. nov. is a unique species in having colorized antennae, beside this character, it would be similar to *Megastigmus helinae* Roques & Copeland, 2016 and *Megastigmus smithi* Roques & Copeland, 2016 in having ovipositor sheaths much shorter ( $0.4-0.6 \times$ ) than length metasoma but it differs from both of them in having body colour yellow without any black band on the body (in the both species with a narrow black band along anterior suture of pronotum or median rufous band extending from pronotum to scutellum and parts of gaster dark brown (Roques et al., 2016).

## LITERATURE CITED

- Ashmead, W. H. 1900. Notes on some New Zealand and Australian parasitic Hymenoptera, with descriptions of new genera and species. Proceedings of the Linnean Society of New South Wales, 25: 333-245.
- Ashmead, W. H. 1904. Descriptions of new Hymenoptera from Japan-II. Journal of the New York Entomological Society, 12: 146-165.
- Auger-Rozenberg, M. A., Kerdelhué, C., Magnoux, E., Turgeon, J., Rasplus, J. Y. & Roques, A. 2006. Molecular phylogeny and evolution of host-plant use in conifer seed chalcids in the genus *Megastigmus* (Hymenoptera:Torymidae). Systematic Entomology, 31 (1): 47-64.
- Ayberk, H. & Cebeci, H. 2010. Survey of Trojan fir seed orchard in Edremit-Gurgendag Region of Turkey. African Journal of Biotechnology, 9 (41): 6963-6965.
- Boucek, Z. 1988. Australasian Chalcidoidea (Hymenoptera). A biosystematic revision of genera of fourteen families, with a reclassification of species. CAB International, Wallingford, Oxon, U.K., Cambrian News Ltd; Aberystwyth, Wales. 832 pp.
- Crosby, C. R. 1913. A revision of the North American species of *Megastigmus* Dalman. Annals of the Entomological Society of America, 6: 155-170.
- Curtis, J. 1829. A guide to an arrangement of British Insects; being a catalogue of all the named species hitherto discovered in Great Britain and Ireland London, pp: 256.
- Dalla Torre, K. W. von. 1898. Catalogus Hymenopterorum hucusque descriptorum systematicus et synonymicus. V. Chalcididae et Proctotrupidae. Leipzig, pp: 598.
- Dalman, J. W. 1820. Forsök till uppställning af insect familjen Pteromalini, i Synnerhet med afseende på de i sverige funne arter. K. Vetensk. Akad. Handl., 41: 177-182.
- Daneshvar, S., Talebi, A. A. & Fathipour, Y. 2009. The wasps associated with seeds and galls of *Rosa canina* in Iran. Advances in Environmental Biology, 3 (1): 61-68.
- Doğanlar, M. 2015. Diagnosis of *Megastigmus* spp. (Hymenoptera: Torymidae) reared from galls of *Leptocybe invasa* Fisher & LaSalle, 2004. (Hymenoptera: Eulophidae) on *Eucalyptus* spp. (Myrtaceae), with description of a new species from South Africa. Entomofauna, 36 (43): 561-580.
- Doğanlar, M. & Doğanlar, O. 2010. Review of the species of *Gugolzia* Delucchi and Steffan (Hymenoptera: Pteromalidae) in Europe and Turkey, with descriptions of new species. Turkish Journal of Zoology, 34 (1): 23-34.
- Doğanlar, M. & Hassan, E. 2010. Review of Australian species of *Megastigmus* Hymenoptera: Torymidae) associated with *Eucalyptus*, with descriptions of new species. Australian Journal of Basic and Applied Sciences, 4 (10): 5059-5120.
- Doğanlar, M., Huang, Z.-Y., Guo, C.-H., Lu, W., Yang, Z.-D., Yang, X.-H. & Zheng, X.-L. 2017. A new species of *Megastigmus* (Hymenoptera: Torymidae: Megastigminae) from China. Munis Entomology & Zoology, 12 (2): 368-374.
- Doğanlar, M., Zaché, B. & Wilken, C. F. 2013. A New Species of *Megastigmus* (Hymenoptera: Torymidae: Megastigminae) from Brazil. Florida Entomologist, 96 (1): 196-199.
- Fabre, J. P., Alptekin, C. U. & Chalon, A. 1994. Importance des attaques des graines de cedre du Liban, *Cedrus libani*, en Turquie par *Megastigmus schimitscheki* (Hym. Torymidae) et risques d'extesion de cet insecte au cedre de l'Atlas, *Cedrus atlantica*. Annales de la Recherche Forestière au Maroc., 27 (2)(special): 565-575.

- Gencer, L.** 2003. The chalcidoid parasitoids of *Diplolepis mayri* Schld. (Hymenoptera: Cynipidae), a pest of *Rosa canina* L. in Sivas province. *Türkiye Entomoloji Dergisi*, 27 (2): 107-111.
- Grissel, E. E.** 1999. An annotated catalog of World Megastigminae (Hymenoptera: Chalcidoidea: Torymidae). *Contrib. American Entomol. Inst.*, 31 (4): 1-92.
- Grissel, E. E.** 2006. A new species of *Megastigmus* Dalman (Hymenoptera: Torymidae), galling seed capsules of *Eucalyptus camaldulensis* Dehnhardt (Myrtaceae) in South Africa and Australia. *African Entomology*, 14 (1): 87-94.
- Grissel, E. E. & Hobbs, K.** 2000. *Megastigmus transvaalensis* (Hussey) (Hymenoptera: Torymidae) in California: methods of introducing and evidence of host shifting, pp. 267. In A. D. Austin and M. Dowton [eds.], *Hymenoptera Evolution, Biodiversity and Biological Control* CSIRO Publishing, Collingwood, Australia.
- Grissel, E. E. & Prinsloo, G. L.** 2001. Seed-feeding species of *Megastigmus* (Hymenoptera: Torymidae) associated with *Anacardiaceae*. *Journal Hymenoptera Research*, 10 (2): 271-279.
- Hussey, N. W.** 1957. *Megastigmus* species (Hym., Torymidae) associated with seeds of silver fir and cedar. *Entomologist's Monthly Magazine*, 93 (1121): 252-253.
- Lessmann, D.** 1962. On knowledge of some cone and seed pests of cedar of Lebanon (*Cedrus libani*) in Turkey. *Zeitschrift für Angewandte Entomologie*, 49 (4): 363-371.
- Narendran, T. C., Girish Kumar, P. & Vastrad, A. S.** 2010. Two new species of *Megastigmus* Dalman (Hymenoptera: Torymidae) from India, with a revised key to Indian species. *Records of the Zoological Survey of India*, 110 (2): 1-6.
- Narendran, T. C., Raji, B. & Remadevi, O. K.** 2003. A review of the oriental species of *Megastigmus* Dalman (Hymenoptera: Torymidae). *Entomon.*, 28 (4): 299-307.
- Novicky, S.** 1954. Beiträge zur Kenntnis der Nadelholz-Samenzerstörer, I.: Zedernsamen-Chalcidier *Megastigmus schimitscheki* n. sp. *Zeitschrift für Angewandte Entomologie*, 36: 220-234.
- Noyes, J.** 2016. The Natural History Museum. Universal Chalcidoidea Database. <http://www.nhm.ac.uk/researchcollection/research/projects/chalcidoids/database>.
- Öncüler, C.** 1991. A catalogue of the parasites and predators of insect pests of Turkey. pp. 278.
- Roques, A. & Skrzypczynska, M.** 2003. Seed-infesting chalcids of the genus *Megastigmus* Dalman, 1820 (Hymenoptera: Torymidae) native and introduced to the west Palaearctic region: taxonomy, host specificity and distribution. *Journal of Natural History*, 37: 215-243.
- Roques, A., Copeland, R. S., Soldati, L., Denux, O. & Auger-Rozenberg, M. A.** 2016. *Megastigmus* seed chalcids (Hymenoptera, Torymidae) radiated much more on Angiosperms than previously considered. I- Description of 8 new species from Kenya, with a key to the females of Eastern and Southern Africa. *ZooKeys*, 585: 51-124.
- Roques, A., Sun, J. H., Pan, Y. Z. & Zhang, X. D.** 1995. Contribution to the knowledge of seed chalcids, *Megastigmus* spp. (Hymenoptera: Torymidae), in China, with the description of three new species. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft-Bulletin de la Societe Entomologique Suisse*, 68: 211-223.
- Roques, A., Carcreff, E. & Rasplus, J. Y.** 1999. *Cupressus sempervirens* L. vs. cypress seed chalcid, *Megastigmus wachtl* Steiner: genetic and evolutionary relationships. *Les Colloques d'INRA*, 90: 65-67.
- Stojanova, A., Civelek, H. S., Yörük, B., Sari, S. & Atahan, T.** 2012. Checklists of Turkish Eurytomidae Walker, 1832 and Torymidae Walker, 1833 (Hymenoptera: Chalcidoidea). *Türkiye Entomoloji Dergisi*, 36 (1): 69-82.
- Xu, Z. H. & He, J. H.** 1995. Note on the species of the phytophagous group of *Megastigmus* (Hymenoptera: Torymidae) from China. *Entomotaxonomia*, 17 (4): 243-253.
- Xu, Z. H., He, J. H. & Liu, Y. S.** 1998. Description of a new species of *Megastigmus* Dalman (Hymenoptera: Torymidae). *Entomotaxonomia*, 20 (4): 297-304.
- Walker, F.** 1833. *Monographia Chalciditum*. (Continued.) *Entomological Magazine*, 1 (2): 115-142.

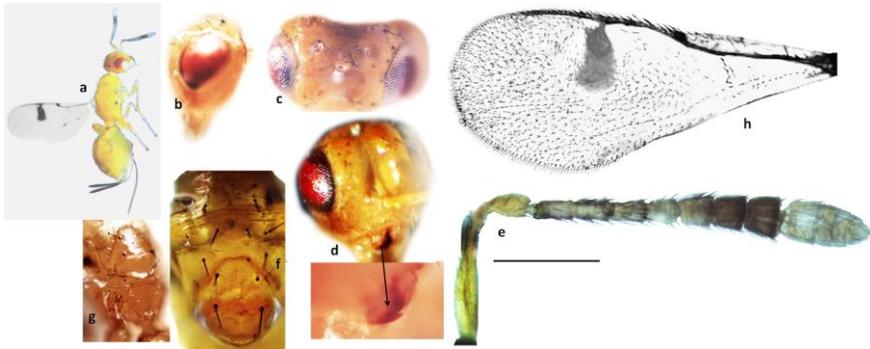


Figure 1. *M. usakensis* sp. nov. female. a, body, in lateral view; b-d, head, b, in lateral view; c, in dorsal view; d, fronto-lateral view; e, antenna; f, scutellum; g, propodeum and petiole; h, forewing. (Scale bar: for a = 1.5 mm; for b-d = 0.44 mm; for e = 0.13 mm; for f, g = 0.53 mm).