



**THE FIRST RECORD OF *EURYTOMA COLEOPTERAE* ZEROVA, 1978
(HYMENOPTERA: EURYTOMIDAE) AS LARVAL PARASITOID OF WEEVILS AND
JEWEL BEETLES (COLEOPTERA: CURCULIONIDAE, BUPRESTIDAE) IN TURKEY
AND TURKMENISTAN**

V.N. Fursov^{1,2}, M.D. Zerova¹, M. Kodan²

¹I.I. Schmalhausen Institute of Zoology of National Academy of Sciences of Ukraine, Kyiv, Ukraine,
e-mails: zerova@izan.kiev.ua, ufensia@gmail.com

²Plant Protection Central Research Institute, Ankara, Turkey
e-mail: munevverkodan@gmail.com

The parasitic chalcid wasp *Eurytoma coleopterae* Zerova, 1978 (Hymenoptera: Eurytomidae) is re-described and illustrated. For the first time parasitoid *E. coleopterae* is reared from the larvae of weevil *Metapion* sp. (Coleoptera: Curculionidae), developing in seeds of *Ruta* sp. (Rutaceae) in Turkey. Also for the first time chalcid wasp *E. coleopterae* was reared from larvae of jewel beetle *Meliboeus cyaneus* Kiasw. (Coleoptera: BUPRESTIDAE), developing in stems of *Cousinia polycephala* Rupr. (Asteraceae) in Turkmenistan. Re-description of type material, a new data on the distribution, biology, host-parasitoid and host-plant trophical associations are given. Material is deposited at the collection of I.I. Schmalhausen Institute of Zoology of National Academy of Sciences of Ukraine (Kyiv, Ukraine).

Key words: *Eurytoma*, Eurytomidae, parasitoid, *Metapion*, Curculionidae, BUPRESTIDAE, Turkey, Turkmenistan.

Перша знахідка *Eurytoma coleopterae* Zerova (Hymenoptera: Eurytomidae) – паразита личинок жуків-довгоносиків і златок (Coleoptera: Curculionidae, BUPRESTIDAE) в Туреччині та Туркменістані.

В.М. Фурсов, М.Д. Зерова, М. Кодан

Наводиться переопис і фотографії типових екземплярів паразитичного виду хальцид з родини Eurytomidae – *Eurytoma coleopterae* Zerova, 1978. Вид вперше виведений з личинок жука-довгоносика *Metapion* sp. (Coleoptera: Curculionidae), що розвивається у насінні *Ruta* sp. (Rutaceae) в Туреччині. Крім того, *E. coleopterae* вперше вказано для фауни Туркменістану, де цей вид виведений з личинок жука-златки *Meliboeus cyaneus* Kiasw. (Coleoptera: BUPRESTIDAE), в стеблах *Cousinia polycephala* Rupr. (Asteraceae). Наведено переопис типового матеріалу, дані нові дані щодо поширення, біології, господарів і їх кормових рослин. Матеріал зберігається в колекції Інституту зоології ім. І.І. Шмальгаузена НАН України (Київ).

Ключові слова: *Eurytoma*, Eurytomidae, parasitoid, *Metapion*, Curculionidae, BUPRESTIDAE, Туреччина, Туркменістан.

Первая находка *Eurytoma coleopterae* Zerova (Hymenoptera: Eurytomidae) – паразита личинок жуков-долгоносиков и златок (Coleoptera: Curculionidae, BUPRESTIDAE) в Турции и Туркменистане

В.Н. Фурсов, М.Д. Зерова, М. Кодан

Приводится переписание и фотографии типовых экземпляров паразитического вида хальцид из семейства Eurytomidae – *Eurytoma coleopterae* Zerova, 1978. Вид впервые выведен из личинок жука-долгоносика *Metapion* sp. (Coleoptera: Curculionidae), которые развиваются в семенах *Ruta* sp. (Rutaceae) в Турции. Кроме того, *E. coleopterae* впервые указан для фауны Туркменистана, где этот вид выведен из личинок жука-златки *Meliboeus cyaneus* Kiasw. (Coleoptera: BUPRESTIDAE), развивающихся в стеблах *Cousinia polycephala* Rupr. (Asteraceae). Приведено переписание типового материала, а также новые данные о распространении, биологии, хозяевах и их кормовых растениях. Материал хранится в коллекции Института зоологии им. И.И. Шмальгаузена НАН Украины (Київ).

Ключевые слова *Eurytoma*, Eurytomidae, parasitoid, *Metapion*, Curculionidae, BUPRESTIDAE, Турция, Туркменистан.

Introduction

The family Eurytomidae consists of over 1400 valid species, which include parasitic and phytophagous species of 88 genera (Noyes, 2019). About 500 species of 17 genera of Eurytomidae are recorded in the Palaearctic region (Zerova, 1976, 1978, 1988, 2010). In the Palaearctics the largest genus *Eurytoma* consists of 230 Palaearctic species, belonging to 14 species groups (Zerova, 1995, 2010). The genus *Eurytoma* is characterized by a strong posterogena carina; mesosoma with a finely meshed sculpture; female's antenna with 5-segmented funiculus and 3-segmented club (rarely with 6-segmented funiculus and 2-segmented club); male's antenna with 5-segmented funiculus and 2-segmented club (rarely with 7-segmented funiculus and without club) (Zerova, 1988, 1995, 2010). The species of the genus *Eurytoma* are recorded as parasitoids of insects from 7 orders; and as phytophagous seed-feeding insects, developing inside seeds of Rosaceae, Pinaceae, Ephedraceae, Euphorbiaceae, and Fabaceae, and in stems of Poaceae and Campanulaceae (Zerova, 2010; Zerova and Seryogina, 1994). This paper provides a new knowledge about host-plant-parasitoid associations and a new distribution records of species *E. coleopterae* Zerova, 1978 (Eurytomidae) in Turkey and Turkmenistan.

Materials and methods

Collection of Eurytomidae of I.I. Schmalhausen Institute of Zoology of National Academy of Sciences of Ukraine (SIZU) was studied; type material of *E. coleopterae* was examined and original micro-photographs were taken using a Leica Z16 APO stereo-microscope equipped with a Leica DFC 450 camera and processed with LAS V3.8 software. Material, including holotype and paratypes, is deposited in the collection of SIZU; some specimens are deposited in the collection of Nazife Tuatay Plant Protection Museum of the Plant Protection Central Research Institute, in Ankara, Turkey (PPCRI). Host plants, *Ruta* sp. (Rutaceae) were collected in the environs of Ankara (Turkey) by the first author in the summer 2016. Insects, weevils (*Metapion* sp.) and parasitoids, *E. coleopterae*, were reared from seeds of *Ruta* sp. (Rutaceae) inside the cages with plants at the Biocontrol laboratory of PPCRI. Material is deposited at the collection of SIZU (Kyiv, Ukraine).

Results and discussion

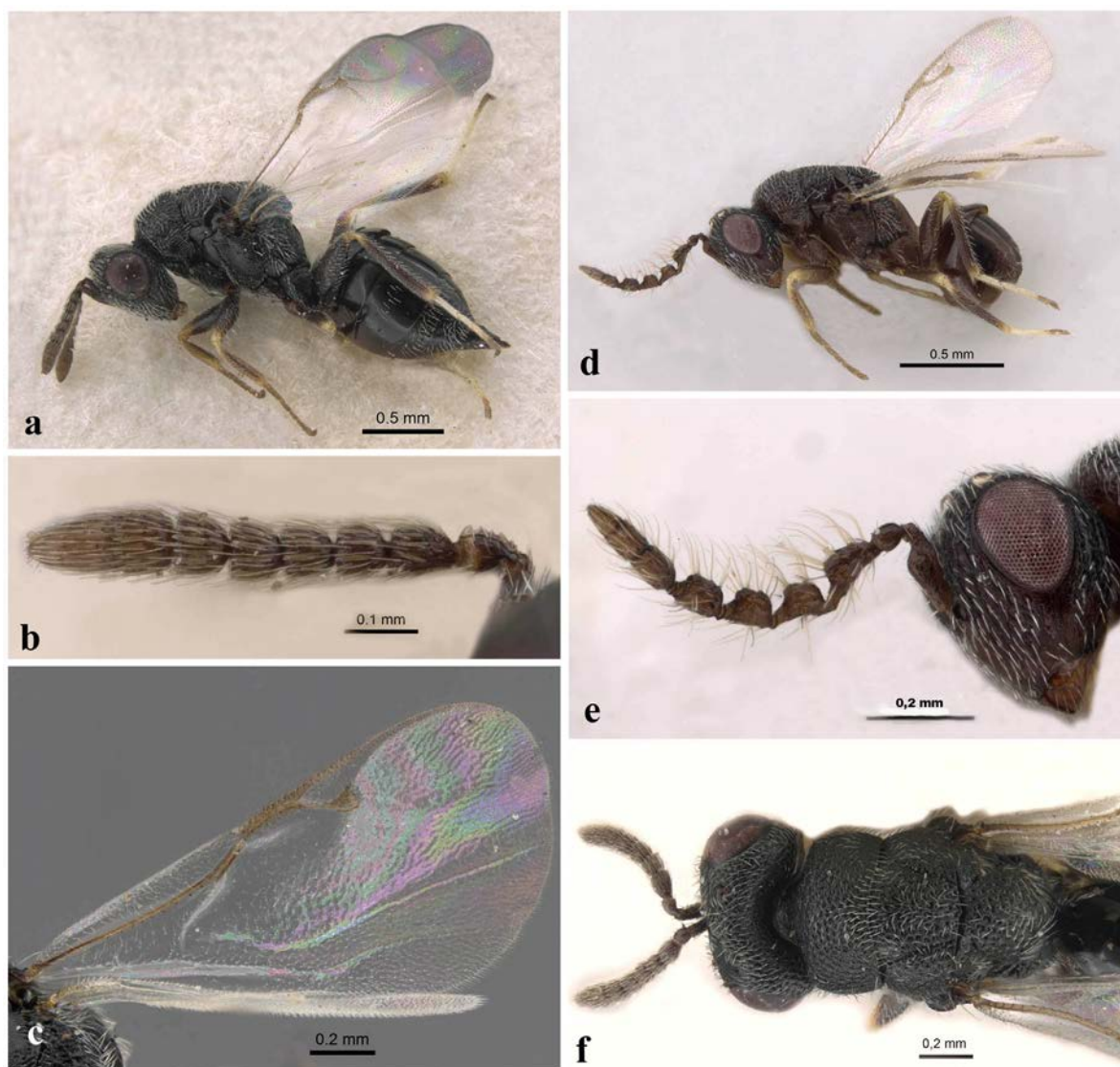
The parasitic chalcid wasp reared from the larvae of weevil *Metapion* sp. (Coleoptera: Curculionidae), developing in seeds of *Ruta* sp. (Rutaceae), was identified as *E. coleopterae* (Hymenoptera: Chalcidoidea: Eurytomidae) (Zerova, 1978, 1995). Parasitoid *E. coleopterae* was collected for the first time in Turkey, and it's a new host and distribution record for Turkey. Chalcid wasp *E. coleopterae* was also reared from larvae *Meliboeus cyaneus* (Ballion) (Coleoptera: Buprestidae), developing in stems of *Cousinia polycephala* Rupr. (Asteraceae). It's a new host and distribution record of *E. coleopterae* in Turkmenistan.

The identification of *E. coleopterae* was made according to the identification keys in Zerova (1995, 2010). Chalcid wasp *E. coleopterae* is re-described and illustrated below. Re-description of type material and a new data on the distribution, biology, host-parasitoid and host-plant trophical associations are given.

Eurytoma coleopterae Zerova, 1978

Re-description. Female (Fig. 1, a, b, c, f). Body length 3.3–3.8 mm (holotype 3.7 mm). Body compact, with a rounded metasoma, habitually resembling some species of genus *Bruchophagus*. Body mostly black, antennae black, in some specimens basal part of scapus yellow; coxae and hips, as well as middle and hind tibiae black, anterior black, only occasionally slightly faint in the middle; tarsi (except dark last segments) yellow; fore wings colorless. Veins of fore wings light yellow.

Sculpture of head and mesosoma is pitched; pits small and not very deep; entire metasoma with uniform, shallow, superficial puncture; pubescence of head and mesosoma short, but thick, silvery.



Figs. 1. *Eurytoma coleopterae* Zerova, 1978 (a, b, c, f – female; d, e – male): a – female, lateral view; b – antenna; c – fore wing; d – male, lateral view; e – antenna and head, lateral view; f – head and mesosoma, dorsal view.

Head (dorsally) almost no wider than pronotum, in frontal view it's wider than its height (ratio 5 : 3); eyes are large, length of genae is approximately 4/5 of longitudinal diameter of eye; clypeus with a small notch on outer edge.

Facial cavity shallow, clearly bordered. Antenna attached in middle of face, with slightly convex scapus, thick 5-segmented flagellum and 3-segmented massive club; 1st segment of flagellum slightly elongated, 2–5th transverse, club broader than flagellum. Mesonotum convex; pronotum in 2.0 times wider than its length; lower edge of mesepisternum with a small denticle in front of the middle coxae.

Propodeum markedly inclined, without a median furrow, in the center almost along its complete width with a flat, rather fringed and finely punctured field; sculpture of fringe is finely-meshed with separate longitudinal thin carinae; its shape very variable; fore coxa on its anterior margin concave; middle coxa without hook-like plate, hind coxa without a comb.

Marginal vein short, as long as radial or slightly shorter; postmarginal vein the longest, radial vein cell somewhat enlarged, convex and light.

Metasoma approximately as long as head and mesosoma together, on some museum's specimens

metasoma shorter, almost as long as mesosoma; all tergites of metasoma with a fine but well marked punctuation; abdominal stalk short, transverse, but clearly differentiated.

Male (Fig. 1, d, e). Body length 1.2–2.5 mm. Antennae black, scapus brownish; flagellum 4-segmented, club 3-segmented; all segments of flagellum markedly convex, hairs on segments considerably longer than width of segments. Petiolus slightly longer than posterior coxae, all tergites of metasoma with the same punctuation as female.

Comparative notes. This species is included in the complex of closely related species (*E. jaceae* Mayr, 1878, *E. abdita* Zerova, 1995, *E. grata* Zerova, 1995), and its closest species to *E. jaceae*, from which it differs by the shorter and rounded metasoma of female, the longer pubescence of flagellum of male, the longer petiolus of male, and male genitalia with digital sclerites with 3 hooks.

Studied material. UKRAINE: 12♀, 3♂ (including holotype, female), Kherson region, Black Sea nature reserve, from stems of *Echinops ritro* L. (Asteraceae) together with *Meliboeus amethystinus* Kiasw. (Coleoptera, Buprestidae), 16.V.1971 (coll. M. Zerova) (SIZU); 7♀, 5♂ (paratypes), same place, from galls of weevils *Sibinia femoralis* Gyll. and *Lixus salsolae* Faust. (Coleoptera, Curculionidae) in stems of *Otites wolgensis* (Hornem.) Grossh. (Caryophyllaceae), 29.VI.1970 (coll. M. Zerova); 4♀, 2♂ (paratypes), same place, from galls of same weevils in stems *O. wolgensis*, 23.VI.1971 (coll. S. Kononova); UKRAINE: 1♀, Kherson region, Black Sea nature reserve, 22.IV.1978 (coll. A. Kotenko); 1♀, same place, 22.IV.1978 (coll. M. Zerova); 1♀, same place, 14.V.1984 (coll. M. Zerova); TURKMENISTAN: 3♀, environs of Ashgabat, hills, ex larvae *Meliboeus cyaneus* (Coleoptera, Buprestidae), in stems of *Cousinia polycephala* Rupr. (Asteraceae), 26.III.1980 (coll. M. Zerova); TURKEY: 9♀, 14♂, Ankara, Yenimahalle, 39°57'51"N, 32°50'23" E (GPS, DMS), steppe hills, 05.VII.2016, em. 10.VII.2016, ex seeds of *Ruta* sp. (Rutaceae), ex *Metapion* sp. (Coleoptera, Curculionidae) (coll. V. Fursov) (SIZU).

Distribution. It is distributed in Turkey (first record), Turkmenistan (first record), Ukraine.

Biology. Chalcid wasp *E. coleopterae* is a parasitoid of larvae of small beetles developing inside galls, seeds and stems of herbaceous plants. It was reared in Ukraine from larvae of *Meliboeus amethystinus* Kiasw. (Coleoptera: Buprestidae) in the stems of *Echinops ritro* L. (Asteraceae) and larvae of *Sibinia femoralis* Gyll. and *Lixus salsolae* Faust. (Coleoptera: Curculionidae) in galls on *Otites wolgensis* (Hornem.) Grossh. (Caryophyllaceae) (Zerova, 1978). It was reared from larvae *Meliboeus cyaneus* (Coleoptera: Buprestidae), in stems of *Cousinia polycephala* Rupr. (Asteraceae), for the first time from Turkmenistan. It was also reared from seeds of *Ruta* sp. (Rutaceae) with larvae *Metapion* sp. (Coleoptera: Curculionidae), for the first time in Turkey.

Acknowledgements

The study of the first author was supported by the Scientific and Technical Research Council of Turkey (TÜBİTAK foundation) (Programme 2221 – Fellowships for Visiting Scientists and Scientists on Sabbatical Leave, project number – 1059B211500675). We express a great acknowledgement to TÜBİTAK for this support. We express sincere appreciation to Dr. Vitaliy Nazarenko (SIZU) for the identification of weevil species (Curculionidae). We thank Dr. Kateryna Martynova (SIZU) for the help with photographing, Dr. Brian Fisher (San Francisco, USA) and Dr. Alexander Radchenko (SIZU) for the opportunity to use a Leica Z16 APO stereomicroscope. The authors are grateful to John Phipps (Kalamata, Greece) for valuable linguistic correction of the manuscript.

References

- Noyes, J.S. Universal Chalcidoidea Database. Natural History Museum, London. Available at: <http://www.nhm.ac.uk/entomology/chalcidoids> (Accessed 01.II.2019).
- Zerova, M.D., 1976. Chalcid wasps of the family Eurytomidae (subfamily Rileyinae and Harmolitinae). Series "Fauna of USSR", 7 (Hymenoptera). Moscow, Leningrad: Nauka, 7 (6): 1–231. (in Russian: Зерова, М.Д. Хальциды сем. Eurytomidae: подсемейства Rileyinae и Harmolitinae. «Фауна СССР»)
- Zerova, M.D., 1978. Hymenoptera Parasitica. Chalcidoidea – Eurytomidae. Series "Fauna of Ukraine". Kyiv: Naukova dumka, 11 (9): 1–465 (in Ukrainian: Зерова, М.Д. Паразитичні перетинчастокрили. Хальциди-Евритоміди.

«Фауна України»).

- Zerova, M.D., 1988. Main trends of evolution and system of the family Eurytomidae (Hymenoptera, Chalcidoidea). Entomological Review, 67 (3): 649–674. (in Russian: Зерова, М.Д. Основные направления эволюции и систематики семейства Eurytomidae (Hymenoptera, Chalcidoidea).
- Zerova, M.D., 1995. Parasitic Hymenoptera – Eurytominae and Eudecatominae of Palaearctics. Kyiv: Naukova dumka, 1995: 1– 459 (in Russian: Зерова, М.Д. Паразитические перепончатокрылые – эвритомины и эвдекатомины Палеарктики).
- Zerova, M.D., 2010. Palaearctic species of the genus *Eurytoma* (Hymenoptera, Chalcidoidea, Eurytomidae): morphological analysis, trophical connections, identification key. Vestnik Zoologii. Separate Issue 24: 1–200 (in Russian: Зерова, М.Д. Палеарктические виды рода *Eurytoma* (Hymenoptera, Chalcidoidea, Eurytomidae): морфобиологический анализ, трофические связи, таблица для определения).
- Zerova, M.D. and Seryogina, L.Y., 1994. Seed-feeding chalcid wasps of Palaearctics. Kyiv: Naukova dumka: 1–229 (in Russian: Зерова, М.Д. и Серегина, Л.Я. Хальциды-сеееды Палеарктики).

Получена 15.05.2019

Подписана в печать 25.06.2019

Received 15.05.2019

Accepted 25.06.2019