Vestnik Zoologii, **53**(2): 107–112
DOI: 10.2478/vzoo-2019-0010

UDC 595.792

TWO NEW SPECIES OF THE GENUS *SYSTOLE* (HYMENOPTERA, CHALCIDOIDEA, EURYTOMIDAE), WITH FISRT RECORD OF *S. COMPLANATA* FROM IRAN

M. D. Zerova[1], A. Al-Sendi[2], V. N. Fursov[1], H. Adeli-Manesh[2], S. E. Sadeghi[2], F. Pirouzi[2]

[1]*Schmalhausen Institute of Zoology, NAS of Ukraine, vul. B. Khmelnitsky, 15. Kyiv, 01030 Ukraine*
E-mail: zerova@izan.kiev.ua; ufensia@gmail.com
[2]*University of Tehran, Dept. of Plant Protection, Institute of Entomology; Islamic Republic of Iran*
E-mail: hghajar@ut.ac.ir

urn:lsid:zoobank.org:pub:C5D5CB2A-74E2-4D8D-AC7F-FCC72A76B8CB

Two New Species of the Genus *Systole* (Hymenoptera, Chalcidoidea, Eurytomidae), with First Record of *S. complanata* from Iran. Zerova, M. D., Al-Sendi, A., Fursov, V. N., Adeli-Manesh, H., Sadeghi, S. E., Pirouzi, F. — *Systole irana* sp. n. and *S. dzintari* sp. n. are described from Iran. *Systole complanata* Zerova is recorded from Iran for the first time. These three *Systole* species belong to the subgenus *Systole* (*Systole*). The species of this subgenus have trophic associations with plants of family Apiaceae. An identification key to species of *Systole* from Iran is given. Holotype and paratypes of new species are deposited in the collection of I. I. Schmalhausen Institute of Zoology National Academy of Sciences of Ukraine (Kyiv).
Key words: Chalcidoidea, Eurytomidae, *Systole*, Apiaceae, Iran.

Introduction

Four species of *Systole* have been recorded from Iran by now: *S. albipennis* Walker (Bouček 1952, 1977, Peck 1963), *S. coriandri* Gussakovsky reared from seeds of *Dorema ammoniacum* (Zerova, 1978), *S. eremodauci* Zerova (Alehosein et al., 2014), and *S. foeniculi* Otten, reared from seeds of *Foeniculum vulgare* (Otten 1941; Bouček, 1952, 1988; Zerova 1978; Saghaei, 2018). Recently, two previously unknown species of the genus *Systole* were reared in Iran from the seeds of umbelliferous plants in 2011 and are described here. One species, *S. irana* sp. n., was reared from seeds of *Prangos acaulis* (D.C.) Boronm. (Apiaceae) and another, *S. dzintari* sp. n. was reared from seeds of *Ferula gumosa* Boiss (Apiaceae) in Iran. *Systole complanata* Zerova previously known from Tajikistan and Azerbaijan (Zerova, 1995) was found in Iran for the first time. All these *Systole* species belong to subgenus *Systole* s. str. Descriptions of three species of *Systole*, and an identification key to 7 species of the genus *Systole* known from Iran are provided.

Material

The material discussed in this paper, including the holotypes and paratypes of new species, are deposited in the collection of I. I. Schmalhausen Institute of Zoology of National Academy of Sciences of Ukraine, Kyiv, Ukraine (SIZK). The holotype of *S. complanata* Zer. is deposited in Zoological Institute of Russian Academy of Sciences, Saint-Petersburg, Russian Federation (ZIN).

Systole* (*Systole*) *irana Zerova et Al-Sendi, **sp. n.** (fig. 1, *1–5*)

urn:lsid:zoobank.org:act:0919BD10-E640-4A64-8245-84CF80648859

Material. Holotype ♀, and 4 ♀ paratypes: Iran, Lorestan, Servand region, 10 June 2011, from seeds of *Prangos acaulis* (DC.) Boronm (Apiaceae) (Fateme Pirouzi leg.).

Female. Body length 2.1–2.4 mm, holotype 2.2 mm. Head, mesosoma and metasoma black, antennae, including scape and flagellum black, coxae black, hind and mid femur and tibia black, fore femur black, but fore tibia some dark yellow at the apex, tarsi of all legs brownish-yellow; tip of ovipositor black; veins of fore wings yellow.

Head (dorsally) wider than its length (ratio 1.90 : 1); wider than pronotum; temple in dorsal view shorter than length of eye (1 : 1.41). Head (in frontal view) broader than high (ratio 1.48 : 1); malar space some shorter than height of eye (1 : 1.15). External margin of

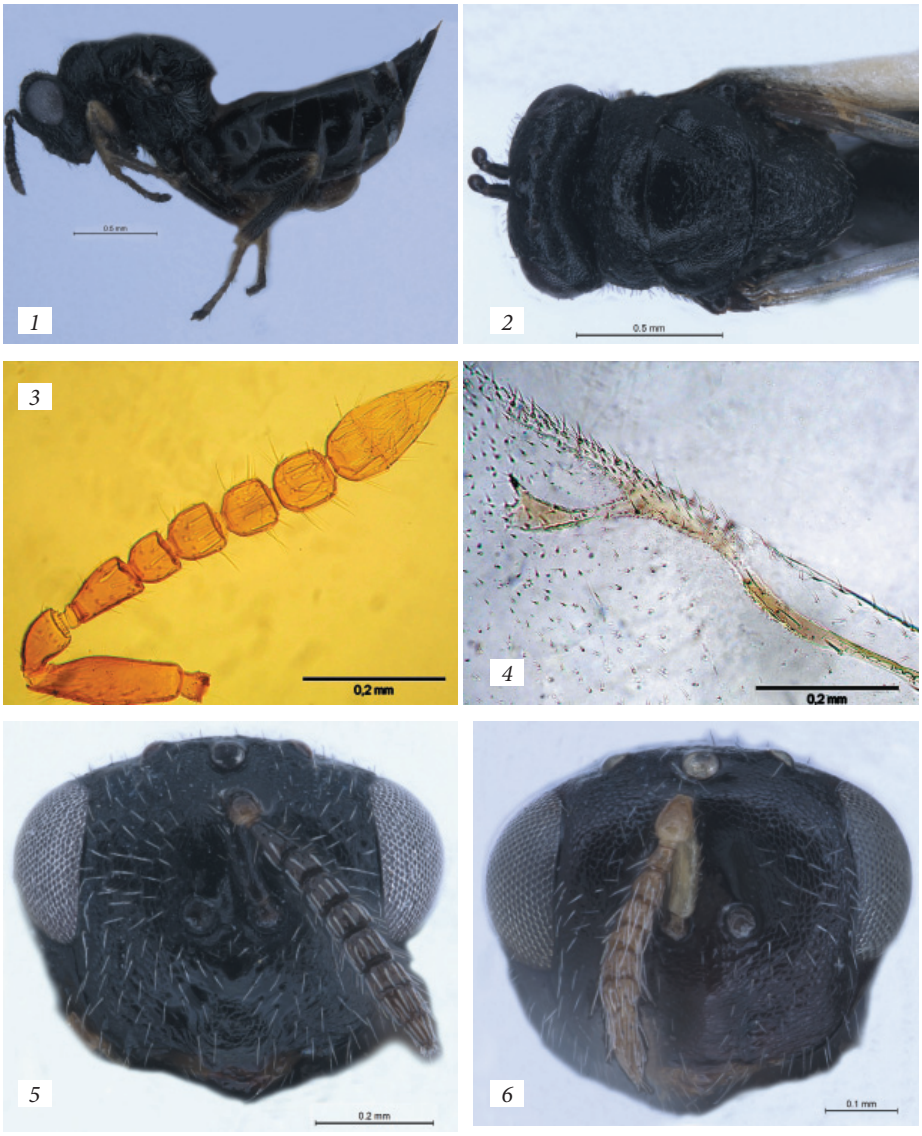

Fig. 1. *Systole irana* Zerova et Ayad Al-Sendi, sp. n.: *1–4* — female, holotype; *1* — adult, lateral view; *2* — head and thorax dorsally; *3* — antenna; *4* — fore wing venation; *5* —head, frontal view; *Systole dzintari* Zerova et Fursov, sp. n., holotype: *6* —head, frontal view.

clypeus straight, eyes bare; face and vertex with fine reticulation, lower face with short white sparse pubescence. Antennae inserted lower than middle part of face; scape not reaching the mid ocellus, short and stout; pedicel much shorter than 1st funicular segment; annellus very short; 1st funicular segment long, much longer than following funicular segments, almost 2.0 times longer than 2nd segment (18 : 10); 2nd flagellar segment transverse; 3nd–5th almost quadrate; club long and stout, 3-segmented, wider than previous flagellar segments; flagellum with very short, pale, sparse pubescence.

Mesosoma slightly bulging (in lateral view); pronotal collar transverse, very short, ratio of width to length 4 : 1, twice shorter than mesoscutum; scutellum as long as mesoscutum; mesosoma dorsally finely reticulated. Propodeum steeped, without median furrow with irregular wrinkles. Legs rather stout, coxae elongate, hind coxa finely reticulate. Disc of forewing with very sparse and hardly visible pilosity. Ratio of marginal, postmarginal and radial veins: 1 : 1.09 : 1.

Metasoma with very short annellus; abdomen (in lateral view) longer than mesosoma (ratio 1.59 : 1); apex of abdomen upturned. 4th abdominal segment the longest; surface of tergites almost bare, only with some short bristles on 4th–6th segments and epipygium.

Male not known.

Diagnosis. *Systole* (*Systole*) *irana* sp. n. is similar to *S. prangicola* Zerova and *S. elongata* Zerova, which also have a long 1st funicular segment in female. *Systole irana* sp. n. differs from them by the distinctive upturned apex of abdomen in female. Specimens from Iran were compared with type material of *S. prangicola* and *S. elongata*.

Systole* (*Systole*) *dzintari Zerova et Fursov, **sp. n.** (fig. 1, *6*; 2, *1–6*)

urn:lsid:zoobank.org:act:55F1B372-71FD-41B6-880E-52A1CDFDEB75

Material. Holotype ♀: Iran, Lorestan, Niyavaran region, June 2011, from seeds of *Ferula gumosa* Boiss (Apiaceae) (Fateme Pirouzi leg.). Paratype 1 ♂: the same label as in the holotype.

Female. Body length 1.25 mm, body brownish-black with light-yellow antennae like a light-yellow amber. Coxae brownish-black, femora brown with yellow tip, tibiae dark-yellow, brownish in the middle, tarsi light-yellow, tip of ovipositor brown, antennae bright-yellow, venation of fore wing light-yellow, almost white.

Head (dorsally) as wide as pronotum; 3.0 times wider than its length; ratio of POL to OOL as 2.1 : 1; temples very short. Head (in frontal view) broader than its height (1.3 : 1); malar space equal to height of eye; ventral margin of clypeus straight; face with very fine reticulation, almost smooth. Antennae inserted at middle part of face; scape short, stout, not reaching mid ocellus, pedicel 1.3 times longer than the first funicular segment, annellus very short; first funicular segment short, shorter than the second, 4th and 5th flagellar segments much stouter, than previous, all segment a little wider than long; club very stout, much wider than flagellar segments; flagellum with pale sparse pubescence.

Mesosoma somewhat bulging (lateral view), pronotal collar broader than its length (ratio 3.58 : 1) and almost twice shorter than mesoscutum (1 : 1.83); scutellum much shorter than mesoscutum (1 : 2); thorax dorsally finely reticulate, almost smooth. Propodeum slightly declivous with very small irregular cells without distinct median furrow. Fore coxae elongate finely reticulate, mid and hind coxae roundish. Marginal and radial veins equal in length, postmarginal 1.3 times as long as marginal vein, short; disc of fore wing with very sparse and hardly visible pilosity.

Metasoma with very short transverse petiolus, abdomen shorter than mesosoma (40 : 45) narrowed to the apex, 4th tergite the longest; all segments bare, flat.

Male. Body length 1.3 mm. Body brownish-yellow, antennae yellow; abdomen elongate, petiolus shorter than hind coxa (in profile). Antennae with short, stout scape; funicle 4-segmented; 1st segment the longest, 2nd slightly longer, 3rd and 4th equal in length; club 3-segmented, long, but not widening; pubescence of funicle short, white and sparse.

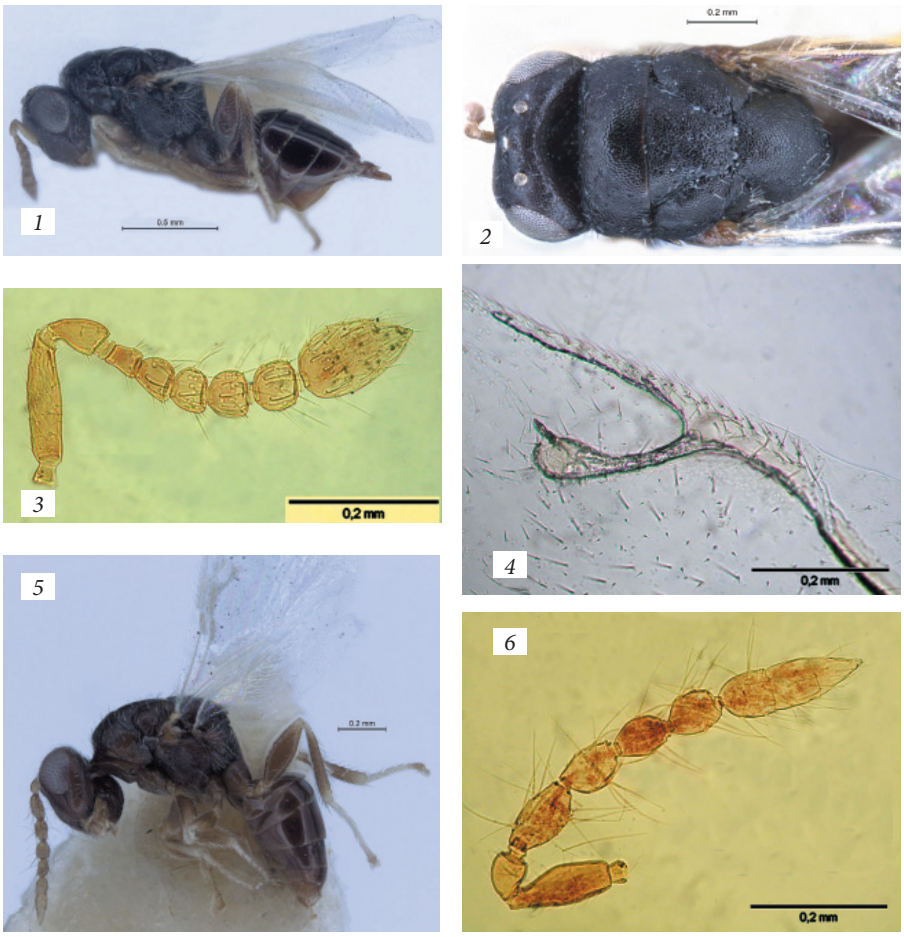

Fig. 2. *Systole dzintari* Zerova et Fursov, sp. n.: *1–4* —female, holotype; *5–6* — male, paratype; *1* — adult, lateral view; *2* — head and thorax dorsally; *3* — antenna; *4* — fore wing venation; *5* — adult, lateral view; *6* — antenna.

Diagnosis. New species is close to *S. minima* Zerova et Çam, which also has yellow antennae, but *S. dzintari* sp. n. differs from this species by the structure of antenna in female, which does not have the short 3rd segment; by shorter abdomen which is much shorter than mesosoma, but the abdomen of *S. minima* as long as mesosoma. Specimens from Iran were compared with type material of *S. minima*.

Ethymology. The species has light-yellow, amber-like antennae. Name "dzintari" means "amber" in Latvian language.

Systole* (*Systole*) *complanata Zerova, 1972 (fig. 3, *1–6*)

Zerova, 1972: 924; 1995: 285; Zerova, Seryogina, 1994: 139, 214.

Material. 3 ♀, 1 ♂, Iran, Lorestan, Zaghe region, June 2011 (Fateme Pirouzi leg.).

Type material examined. Holotype: ♀, "Tajikistan, Horog, ex seeds *Heracleum lehnannianum* Bng., coll. 22.VII.1964 (Sugonyaev leg.) (ZIN); ♀, paratype, same labels, emerg. V.1967". (SIZK).

Female. Body length about 2.0 mm. Body black, legs black, only fore femora brownish, tarsi brown; tip of ovipositor black, antenna dark-brown, wings hyaline, venation of fore wing light brown. Head (dorsally) slightly wider than pronotum; in frontal view wider than height (ratio 7 : 5); malar space equals in length to height of eye; ventral margin of clypeus straight with deep tentorial pits on upper sides; surface of clypeus flat; face and vertex with fine reticulation. Antennae inserted at middle part of face, with short and stout

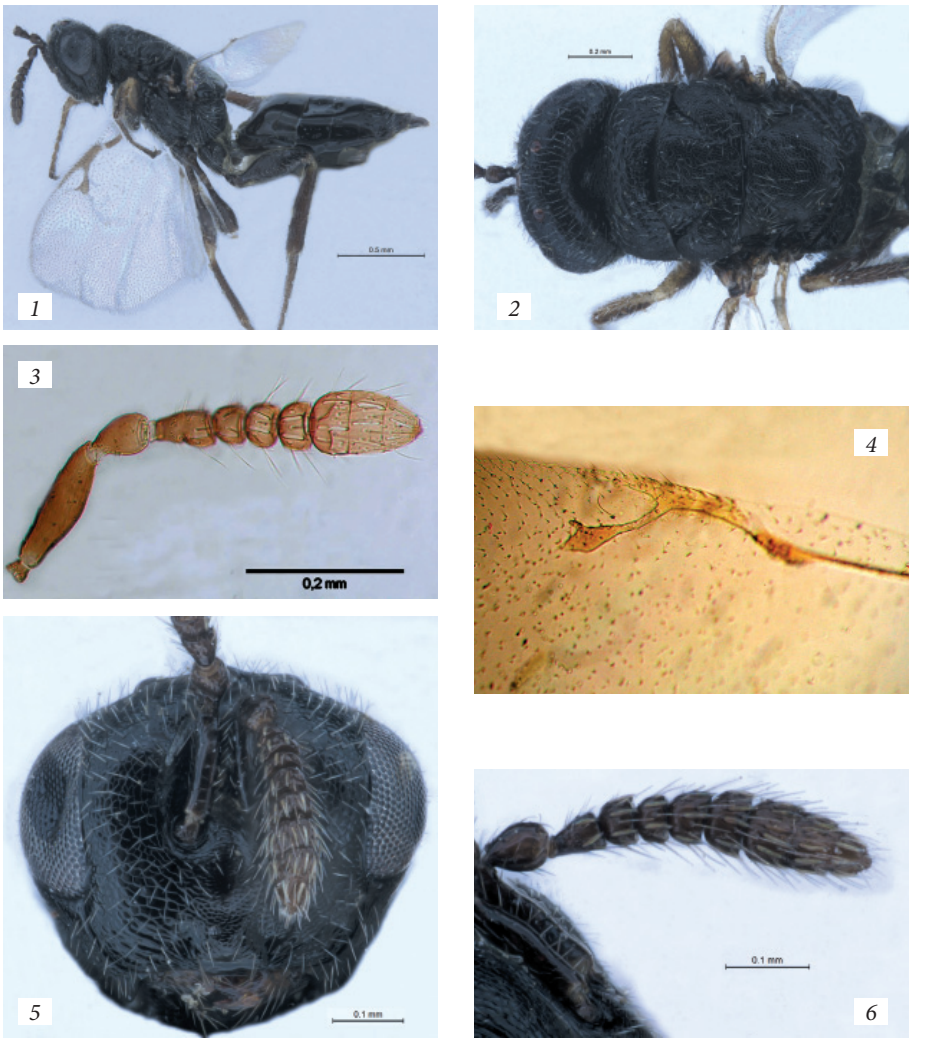

Fig. 3. *Systole complanata* Zerova, 1972: *1–6* — female, paratype; *1* — adult, lateral view; *2* — head and thorax dorsally; *3, 6* — antenna; *4* — fore wing venation; *5*— head, frontal view.

scape not reaching the mid ocellus; 1st flagellar segment slightly longer than its width (in distal part); 2nd–5th flagellar segments quadrate; club stout, as long as three previous flagellar segments; funicle is widening to distal part, with pale sparse pubescence.

Mesosoma with flat dorsum; pronotal collar very short, almost 5.0 times as wide as long, and 2.0 times shorter than scutum, and almost as long as scutellum. Propodeum slightly sloping, wide and bulging on sides, with very thin, shallow sculpture. Forewing with short, but well-visible brown pubescence. Marginal vein as long as postmarginal vein; radial vein shorter than postmarginal, and with slightly elongated stigma.

Metasoma with short, but well-visible petiolus; abdomen shorter than head and mesosoma (in lateral view), without pubescence.

Male not known.

Biology. The larvae in seeds of *Heracleum lehmannianum* Bunge in Tajikistan (Zerova, 1972). The host plant in Iran is unknown.

Distribution. Tajikistan, Azerbaijan, Iran.

Diagnosis. Species *S. complanata* is differentiated from other *Systole* species by flat dorsum, shorter pronotal collar and slightly elongated stigma. Specimens from Iran were compared with type material of *S. complanata*.

Systole (*Systole*) *prangicola* Zerova

Material. Paratypes: 2 ♀, "Tajikistan, Dushanbe, Kondara, ex *Prangos pabularia*, coll. 24.07.1968 (Alimatova leg.)" (SIZK).

Systole (*Systole*) *elongata* Zerova

Material. Paratypes: 24 ♀, "Turkmenskaya SSR, Repetek, ex seeds *Schurmannia kureli*, coll. 31.05.1967 (V. A. Tryapitzin leg.)" (SIZK).

Systole (*Systole*) *minima* Zerova et Ģam

Material. Holotype ♀: "Turkey, Karatas-Adana, coll. 8.08.1984 (M. Doganlar leg.)" (SIZK).

Key to species of the genus *Systole* from Iran

1 Female with upturned apex of abdomen. Body black, antennae black. ♀ 2.1–2.4 mm. Larvae in seeds of *Prangos acaulis* (DC.) Boronm. .....*Systole* (*Systole*) *irana* Zerova et Al-Sendi, sp. n.
— Females abdomen not upturned at the apex, elongate. 2
2 Dorsal part of thorax flat. Female's antennae dark brown. ♀ about 2.0 mm. In seeds of *Heracleum lehmannianum* Bunge .....*Systole* (*Systole*) *complanata* Zerova
— Dorsal part of thorax bulging.....3
3. Female antennae yellow. Body brownish-black, by female and light brown by male. ♀, ♂, about 2.0 mm. In seeds of *Ferula gumosa* Boiss. .....*Systole* (*Systole*) *dzintari* Zerova et Fursov, sp. n.
— Female antennae brown or black. 4
4. Postmarginal vein longer than marginal (15 : 10), radial the shortest, the fifth funicular segment in female 1.5 times longer than the fourth. ♀, ♂ 1.7–1.8 mm. In seeds of *Eremodaucus lehmannii* Bunge.....*Systole* (*Systole*) *eremodauci* Zerova
— Postmarginal vein equal to or shorter than marginal. 5
5. Female abdomen elongated, longer than mesosoma (ratio 3 : 2,3). Postmarginal and marginal veins equal in length. ♀ 1.5–2.5 mm. In seeds of *Coriandrum sativum* L. ..... *Systole* (*Systole*) *coriandri* Gussakovsky
— Female abdomen roundish. 6
6. Face without pubescence, almost bare; postmarginal vein slightly shorter than marginal and as long as radial. ♀, ♂ 1.8–2.2 mm. In seeds of *Carum carvi* L., *Ferula orientalis* L., *Bupleurum rotundifolium* L., *B. fruticosum* L., *Pastanica* sp., *Petroselinum sativum* (Mill.) Fuss.....*Systole* (*Systole*) *albipennis* Walker
— Face with distinct pubescence; postmarginal vein as long as marginal. ♀, ♂ 1.8–2.3 mm. In seeds of *Foeniculum officinalis* Mill..... *Systole* (*Systole*) *foeniculi* Otten

References

Alehosein, A., Lotfalizadeh, A., Yarmand, H., Fallahzadeh, M. 2014. First record of the seed-eating wasp, *Systole eremodauci* (Hym.: Eurytomidae) from Iran. *Journal of Entomological Society of Iran,* **34** (2), 15–16.

Bouček, Z. 1952. A new pest of cumin, *Systole albipennis* Walk. (Eurytomidae, Chalc., Hym.). *Folia Zoologica Entomologica,* 1, 4–9.

Bouček, Z. 1977. A faunistic review of the Yugoslavian Chalcidoidea (parasitic Hymenoptera). *Acta Entomologica Jugoslavica,* 13 (suppl.), 1–145.

Bouček, Z. 1988. *Australasian Chalcidoidea (Hymenoptera). A biosystematic revision of genera of fourteen families, with a reclassification of species.* CAB International Institute of Entomology, Wallingford, Oxon, UK, 1–832.

Otten, E. 1941. Gezogene Chalcididen und ihre Wirte. II. *Arbeiten über Morphologische und Taxonomische Entomologie*, 8, 255–266.

Peck, O. 1963. A catalogue of the Nearctic Chalcidoidea (Insecta, Hymenoptera). *The Canadian Entomologist, Suppl.*, 30, 1–1092.

Saghaei, N., Fallahzadeh, M., Lotfalizadeh, H. 2018. Annotated catalog of Eurytomidae (Hymenoptera: Chalcidoidea) from Iran. *Transactions of American Entomological Society,* 144, 263–293.

Zerova, M. D. 1972. New *Systole* Walk. species from Middle Asia (Hymenoptera, Eurytomidae) *Zoologicheskii Zhurnal*, **51** (6), 922–924 [In Russian].

Zerova, M. D. 1978. *Fauna of Ukraine. Hymenoptera Parasitica. Chalcidoidea — Eurytomidae*. Naukova Dumka, Kiev, Vol.11, Is. 9, 1–465 [In Ukrainian].

Zerova, M. D. 1995. *Parasitic Hymenoptera — Eurytominae and Eudecatominae of Palaearctics*. Naukova Dumka, Kyiv, 1–459 [In Russian].

Zerova, M. D., Seryogina, L. Ya. 1994. *The seed-feeding Chalcidoidea of Palaearctics.* Naukova Dumka, Kyiv, 1–232 [In Russian].

Zerova, M. D., Seryogina, L. Ya., Ģam H. 2003. New species of Eurytomidae (Hymenoptera: Chalcidoidea) from Turkey. *Zoologische Mededelingen,* **77** (14), 259–266.

Received 22 August 2018
Accepted 5 March 2019