Two New Species of the Genus Systole (Hymenoptera, Chalcidoidea, Eurytomidae), with First Record of S. complanata from Iran

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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 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 Gussakovky 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)

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; 3rd–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)
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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, petiolar 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.
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Diagnosis. New species is close to *S. minima* Zerova et Ģam, 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*.


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


**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...
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*.

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.
**Systole (Systole) prangicola** Zerova


**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 Ġam

**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 *Herculeum 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. ♂, ♀, σ, 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. ♂, ♀, σ 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) coriandi Gussakovskiy
   — Female abdomen roundish. .........................................................................................................................................6
6. Face without pubescence, almost bare; postmarginal vein slightly shorter than marginal and as long as radial. ♂, ♀, σ 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. ♂, ♀, σ 1.8–2.3 mm. In seeds of *Foeniculum officinalis* Mill............................................................. Systole (Systole) foeniculi Otten

**References**


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