A preliminary study of the cleptoparasitic bees of the genus *Coelioxys* (Hymenoptera: Megachilidae) in northern Iran, with six new records

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**Abstract:** A survey on the megachilid bees (Hymenoptera: Megachilidae) fauna of northern Iran, between 2010 and 2011, led to the identification of eleven species of the genus *Coelioxys* Latreille belonging to subgenera *Allocoelioxys* (6 species), *Boreocoelioxys* (2 species), *Coelioxys* (2 species) and *Liothyrapis* (1 species). Of these, six species and one subgenus (*Liothyrapis*) are new to the fauna of Iran. Detailed illustrations of morphological characters, a key to the species of the genus *Coelioxys* and an updated checklist of Iranian species of *Coelioxys* are provided.

**Keywords:** *Coelioxys*, cleptoparasitic bee, Megachilidae, new record

**Introduction**

*Coelioxys* Latreille is a cosmopolitan genus of tribe Megachilini (Hymenoptera: Megachilidae) including cleptoparasitic bees related to the genus *Megachile* Latreille (Michener, 2007). With 6 subgenera and about 200 described species, the old world cleptoparasitic bee of the genus *Coelioxys* is a relatively diverse taxon (Warncke, 1992; Gupta, 1993; Nagase, 2006; Wu, 2006; Michener, 2007; Ascher and Pickering, 2013). The species of the genus *Coelioxys* are known as cuckoo bees, because the larvae grow up on food stolen from their hosts. Cleptoparasitism has been defined as an ecological interaction, in which the youngs of one species feed and develop with the food provided for the youngs of another species (Rozen, 2000). The megachilid bees of genus *Coelioxys* are generally cleptoparasitic on other megachilids, while a few species attack species of *Anthophora*, *Centris*, *Euglossa* and *Tetralonia* (Michener, 2007). The genus has five subgenera including *Allocoelioxys*, *Boreocoelioxys*, *Coelioxys*, *Mesocoelioxys* and *Liothyrapis* in Eastern Mediterranean and Near East (Warncke, 1992; Grace, 2010). *Mesocoelioxys* is a monotypic subgenus and the only species, *Coelioxys argentea* Lepeletier 1841, distributed in Greece, Cyprus and Turkey (Warncke, 1992; Grace, 2010). *Coelioxys brevis* Eversmann, 1852, *Coelioxys elongata* Lepeletier, 1841 and *Coelioxys conoidea* (Illiger, 1806) have been reported first time from Iran by Morice (1921). Then, Alfken (1927, 1935) reported three species, namely *Coelioxys conoidea* (Illiger, 1806), *Coelioxys haemorrhhoa* Förster, 1853 and *Coelioxys rufescens* Lepeletier & Audinet-Serville, 1825, from Iran. Warncke (1992) reviewed the thirty-three western Palaearctic *Coelioxys* species and reported *Coelioxys aurolimbata* Förster, 1853 and *Coelioxys iranica* Warncke, 1992 from Iran, which the latter species is endemic. Schwarz (2001) described a new species as *Coelioxys artemis* Schwarz, 2001 from Turkey some paratypes of which were selected from the specimens collected from Iran.
Later, Schwartz and Gusenleitner (2003) described another endemic species, *Coelioxys warnckei* Schwarz & Gusenleitner, 2003 based on specimens collected from Shiraz. Grace (2010) listed seven species of *Coelioxys* for Iran which includes two other species, *Coelioxys echinata* Förster, 1853 and *Coelioxys polycentris* Förster, 1853. Khaghaninia *et al.* (2010) during study of megachilid bees of Aynali forests in East Azarbaijan province, discovered *Coelioxys afra* Lepeletier, 1841 for the first time from Iran. The fauna of the genus *Coelioxys* has been poorly studied in Iran. Only twelve species have previously been recorded in hundred years (Moric, 1921; Alfken, 1927, 1935; Warncke, 1992; Schwarz, 2001; Schwarz and Gusenleitner, 2003; Grace, 2010; Khaghaninia *et al.*, 2010). Conservation of organisms and their habitats is related to knowledge of their exact geographic distribution. Geographic records of the cleptoparasitic bees can provide useful data for the conservation purposes because the bees play a stabilizing role within their communities, representing the apex of bee communities and first guild to respond to disturbances (Sheffield *et al.*, 2013). The present contribution to knowledge of the cleptoparasitic bees is based on new data and material collected from northern provinces of Iran.

**Materials and Methods**

Material was collected from different habitats of the northern Iran during 2010 and 2011, using Malaise traps and sweep net. The specimens were extracted from the traps and sorted weekly. After that, the collected specimens by Malaise traps were transferred to 96% ethanol for five minutes, followed by a soak in hexamethyldisilazane (HMDS) for 30 min and finally placed on a glass plate to dry. The dried specimens were pinned and labeled. The photographs were taken using an Olympus AX70 microscope and an Olympus SZX9 stereomicroscope equipped with a Sony CCD digital camera. Terminology of the morphological characters for the genus *Coelioxys* and its subgenera followed Michener (2007). Identification of species of the genus *Coelioxys* was performed using Warncke (1992), Amiet *et al.* (2004) and Banaszak and Romasenko (1998). The specimens were deposited in the insect collection of the Department of Entomology, Tarbiat Modares University, Tehran.

**Results**

The research on the cleptoparatic bee of genus *Coelioxys* revealed eleven species belonging to the four subgenera (*Allocoelioxys*, *Boreocoelioxys*, *Coelioxys* and *Liothyrapis*). Of these, we report here six species and one subgenus (*Liothyrapis*) for the first time from Iran. The newly recorded species are indicated by an asterisk (*).

*Coelioxys (Allocoelioxys) acanthura* (Illiger, 1806) *

**Material examined:** QAZVIN province-Kuhin, 26-vii-2011, 1♂, swept on *Centaurea* sp.

**Distribution:** Algeria, Europe, Morocco, Northern Asia, Palestine, Siberia, Turkey (Warncke, 1992; Banaszak and Romasenko, 1998; Ortiz-Sánchez *et al.*, 2009; Grace, 2010). Newly recorded from Iran.

**Diagnosis:** Male. Body squamous (Fig. 1), eyes hairy, fore coxa without spine, tergum II without fovea behind post-gradular groove (Fig. 28), tergum VI with eight teeth (two lateral, six apical), without emargination, with dense close-fitting pubescence of squamae basally, and a longitudinal mid-carina (Fig. 25), tergum VII with median tooth apically (Fig. 27), sternum VI spine-like extending below tergum VI.

**Host:** Cleptoparasite of subgenus *Chalicodoma* spp. (Hym., Megachilidae) (Warncke, 1992; Banaszak and Romasenko, 1998; Grace, 2010).

*Coelioxys (Allocoelioxys) afra* Lepeletier, 1841

**Material examined:** TEHRAN province-Malard, 08-vi-2010, 1♀; 13-vii-2010, 1♀; 31-viii-2010, 2♀; 07-ix-2010, 1♀; ALBORZ province-Karaj, 14-ix-2010, 1♀; Chalus road, Sarziarat, 07-ix-2010, 1♂, swept on *Medicago sativa* L.; GUILAN province-Astaneh Ashrafieh, Eshman Komachal, 12-vi-2010, 1♀; QAZVIN province-Qazvin, Barajin, 17-viti-
Distribution: Caucasus, Europe, Iran, Northern Africa, Northern Asia, Turkey (Warncke, 1992; Banaszak and Romasenko, 1998; Amiet et al., 2004; Ortiz-Sánchez et al., 2009; Grace, 2010; Khaghaninia et al., 2010).

Diagnosis: Female. Body squamous (Fig. 2), eyes hairy, clypeus finely ruguloso-punctate, with a fulvous white apical fringe, antefrons and frons with a longitudinal mid-carina (Fig. 18), fore coxa without erect spine, tergum VI at apex and sternum VI entirely brownish-red, apical part of tergum VI and sternum VI broad and short, moderately narrowed, with a rounded emargination apically (Fig. 19), sternum VI wider than tergum VI. Male. Similar to female (Fig. 3) except antennae, legs and tergum VI black, genal spot 1/2 of genal wide (Fig. 30), post-gradular groove of tergum II medially broken, tergum II without fovea laterally (Fig. 31), tergum IV without median carina basally, tergum VI with eight teeth (two lateral, six apical) (Fig. 32), tergum VII without median tooth apically. Host: Cleptoparasite of Megachile leachella, Megachile pilidens and M. apicalis (Hym., Megachilidae) (Warncke, 1992; Banaszak and Romasenko, 1998; Amiet et al., 2004; Grace, 2010).

Coelioxys (Allococelioxys) emarginata Förster, 1853*

Material examined: ALBORZ province-Chalus road, Hasanakdar, 18-vii-2010, 1♂, swept on M. sativa.

Distribution: China, Europe, Northern Africa, Russian Far East, Turkey (Warncke, 1992; Banaszak and Romasenko, 1998; Amiet et al., 2004; Wu, 2006; Ortiz-Sánchez et al., 2009; Grace, 2010). Newly recorded from Iran.

Diagnosis: Male. Body squamous (Fig. 5), eyes hairy, genal spot 1/3 of genal wide (Fig. 16), antefrons and frons without a longitudinal mid-carina, fore coxa without erect spine (Fig. 16), tergum II with a fovea laterally, tergal apical bands wide, tergum VI with squamae basally, with eight teeth, two lateral, six apical, without longitudinal median carina, tergum VII without median tooth apically, sternum V with triangular emargination apically, abdominal segments with broad unbroken apical bands. Host: Cleptoparasite of Megachile leucomalla Gerstäcker, 1869 (Hym., Megachilidae) (Warncke, 1992; Amiet et al., 2004; Grace, 2010).

Coelioxys (Allococelioxys) brevis Eversmann, 1852

Material examined: TEHRAN province-Firoozkooh, 13-vii-2011, 1♂, swept on Centaurea sp.

Distribution: Caucasus, Europe, Iran, Northern Africa, Northern Asia, Palestine, Turkey (Morice, 1921; Warncke, 1992; Banaszak and Romasenko, 1998; Amiet et al., 2004; Ortiz-Sánchez et al., 2009; Grace, 2010).

Diagnosis: Male. Body squamous (Fig. 4), eyes hairy, tergum II with fovea behind post-gradular groove (Fig. 29), tergum VI with emargination and broad band of dense squamae basally, without longitudinal median carina, with eight teeth (two lateral, six apical), tergum VII with median tooth apically. Host: Cleptoparasite of M. leachella, M. pilidens and M. apicalis (Hym., Megachilidae) (Warncke, 1992; Banaszak and Romasenko, 1998; Amiet et al., 2004; Grace, 2010).

Coelioxys (Allococelioxys) haemorrhoa Förster, 1853

Material examined: TEHRAN province-Peykanshahr, 28-viii-2010, 1♂, swept on Malva sp.

Distribution: Europe, Iran, Northern Africa, Northern Asia, Turkey (Alfken, 1927; Warncke, 1992; Banaszak and Romasenko, 1998; Ortiz-Sánchez et al., 2009; Grace, 2010).

Diagnosis: Male. Body squamous (Fig. 6), eyes hairy, antennae, legs and tergum VI red (Fig. 33), antefrons and frons with a longitudinal mid-carina, genal spot 1.5 of genal wide, post-gradular groove of tergites 2 complete, tergum VI with median carina basally, tergum VI with eight teeth
Coelioxys (Allocelioxys) semenowi Morawitz, 1894*

**Material examined:** TEHRAN province-Malard, 20-viii-2010, 1 ♀, Malaise trap in orchard.

**Distribution:** Northern Asia (Warncke, 1992). Newly recorded from Iran.

**Diagnosis:** Female. Body squamous (Fig. 7), head and thorax black, abdomen, mandibles and antennae red, eyes hairy, antefrons and frons without a longitudinal mid-carina, front coxa without erect spine, tegulae and legs red, post-gradular groove of tergites II complete, apical tergal bands wide, sternum VI pointed apically (Fig. 20).

**Host:** Unknown.

Coelioxys (Boreocoelioxys) elongata Lepeletier, 1841

**Material examined:** ALBORZ province-Chalus road, Hasanakdar, 15-July-2010, 1 ♀, swept on Centaurea sp.

**Distribution:** Europe, Iran, Northern Africa, Siberia, Turkey (Morice, 1921; Warncke, 1992; Amiet et al., 2004; Grace, 2010).

**Diagnosis:** Female. Body covered with hair, without squamous (Fig. 9), eyes hairy, fore coxa with erect spine (Fig. 17), sternum IV shiny, punctuation similar to sternum III (Fig. 24), sternum VI with lateral subapical notch, length of sternum VI three times the length of median notch (Fig. 21). **Male.** Similar to female (Fig. 10) except terga II-V with unbroken apical bands, tergum II with sub-lateral fovea on each side behind post-gradular groove (Fig. 34), tergum VI with six teeth (two lateral, four apical), with white close-fitting pubescence basally, upper mid-teeth nearly rectangular, short, lower mid teeth long and narrow.

**Host:** Cleptoparasite of M. centuncularis, Megachile alpicola Alfken, 1924, Megachile versicolor Smith, 1844 and Hoplitis papaveris (Latreille, 1799) (Hym., Megachilidae) (Warncke, 1992; Banaszak and Romasenko, 1998; Amiet et al., 2004; Grace, 2010).

Coelioxys (Coelioxys) conoidea (Illiger, 1806)

**Material examined:** QAZVIN province-Qazvin, Zereshk, 06-vii-2011, 1 ♀; 26-vii-2011, 3 ♀.

**Distribution:** Europe, Iran, Northern Africa, Turkey (Morice, 1921; Alfken, 1935; Warncke, 1992; Banaszak and Romasenko, 1998; Amiet et al., 2004; Grace, 2010).

**Diagnosis:** Female. Body covered with hair, without squamous (Fig. 11), eyes hairy (Fig. 15), fore coxa with erect spine, terga I-V with triangular white maculae on each side, tergum VI with a triangularly flatten narrow apical band part, sternum VI without lateral notch (Fig. 21), somewhat wider than tergum VI, and moderately narrowed apically.

**Host:** Cleptoparasite of Megachile maritima (Kirby, 1802), Megachile lagopoda (Linnaeus,
1761) and *Megachile ericetorum* Lepeletier, 1841 (Hym., Megachilidae) (Warncke, 1992; Banaszak and Romasenko, 1998; Amiet et al., 2004; Grace, 2010).

*Coelioxys (Coelioxys) quadridentata* (Linnaeus, 1758) *

**Material examined:** MAZANDARAN province-Haraz Road, Polour, 29-vii-2011, 1♂, swept on *M. sativa*.

**Distribution:** China, Europe, Siberia, Turkey (Warncke, 1992; Banaszak and Romasenko, 1998; Amiet et al., 2004; Wu, 2006; Grace, 2010). Newly recorded from Iran.

**Diagnosis:** Male. Body covered with hair, without squamae (Fig. 12), eyes hairy, front coxa with long and blunt spine, outer calcars of hind tibiae curved, narrower, abdominal terga with apical bands, tergum II without fovea behind post-gradular groove (Fig. 35), tergum V without teeth laterally, tergum VI with six teeth, two lateral, four apical (Fig. 26).

**Host:** Cleptoparasite of *M. leachella*, *M. centuncularis*, *M. circumcincta*, *Megachile willughbiella* (Kirby, 1802) (Hym., Megachilidae), *Anthophora bimaculata* (Panzer, 1798) (Hym., Apidae) (Warncke, 1992; Banaszak and Romasenko, 1998; Grace, 2010).

*Coelioxys (Liothyrapis) decipiens* Spinola, 1838 *

**Material examined:** TEHRAN province-Pishva, Mohammadabad, 15-vi-2011, 1♀, swept on *Onopordon* sp.

**Distribution:** China, Germany, Greece, India, Middle East, Northern Africa, Northern Asia (Warncke, 1992; Gupta, 1993; Wu, 2006; Grace, 2010). Newly recorded from Iran.

**Diagnosis:** Female. Body covered with hair, without squamae (Fig. 13), eyes bare (Fig. 14), first flagellar segment more than half as long as the second, tergum VI with carina ending in bare apical spine, with long erect hairs lateral to carina, sternum VI broad rectangular, its apex pointed, fringed.

**Host:** Cleptoparasite of *Megachile nigripes* Spinola, 1838 (Hym., Megachilidae) (Warncke, 1992).

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**Key to species of Coelioxys collected in this study**

1- Flagellum 10-segmented, tergum VI without spine, female..........................2
2- Flagellum 11-segmented, tergum VI with spines, male..............................7
2- Eyes bare (Fig. 14) (subgenus *Liothyrapis*), sternum VI broad rectangular, its apex pointed, .................................................................

*Coelioxys decipiens* Spinola, 1838 - Eyes hairy (Fig. 15), sternum VI pointed, its apex largely bare.........................3
3- Body squamous, front coxa without erect spine (Fig. 16) (subgenus *Allocoelioxys*).......4
4- Body hairy, without squamous, fore coxa with erect spine (Fig. 17).....................5
4- Antefrons and frons with a longitudinal mid-carina (Fig. 18), sternum VI with median emargination apically (Fig. 19). ...........................................

*Coelioxys afra* Lepeletier, 1841 - Antefrons and frons without a longitudinal mid-carina, sternum VI pointed apically (Fig. 20). ...........*Coelioxys semenowi* Morawitz, 1894
5- Sternum VI without lateral notch (Fig. 21), tergal apical bands broadly broken (subgenus *Coelioxys*). ..*Coelioxys conoidea* (Illiger, 1806) - Sternum VI with lateral subapical notch (Fig. 22), tergal apical bands 2-5 unbroken (subgenus *Boreocoelioxys*). .........................6
6- Sternum IV matt, punctuation finer than sternite 3 (Fig. 24), length of sternum VI two times the length of median notch. ...............

*Coelioxys elongata* Lepeletier, 1841 - Sternum IV shiny, punctuation similar to sternum 3 (Fig. 24), length of sternum VI three times the length of median notch (Fig. 22).

*Coelioxys inermis* (Kirby, 1802) 7- Sternum VI with eight teeth (two lateral, six apical) (subgenus *Allocoelioxys* ) ...............8
8- Sternum VI with six teeth (two lateral, four apical).............................................12
8- Sternum VII with median tooth apically (Fig. 27). ............................................9
9- Sternum VII without median tooth apically.

*Coelioxys conoidea* (Illiger, 1806) - Sternum VI with lateral subapical notch (Fig. 22), tergal apical bands 2-5 unbroken (subgenus *Boreocoelioxys*). .........................6
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9- Sternum VII without median tooth apically.

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8- Sternum VI with six teeth (two lateral, four apical).............................................12
8- Sternum VII with median tooth apically (Fig. 27). ............................................9
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9- Sternum VII without median tooth apically. 

...
First records of \textit{Coelioxys} from Iran

\textbf{Discussion}

Hitherto, twelve species of genus \textit{Coelioxys} have been reported from Iran. Therefore, with six new records of the genus \textit{Coelioxys} from Iran, the number of species increased to 18 (Table 1). The subgenus \textit{Liothyrapis} and species \textit{Coelioxys (Liothyrapis) decipiens} Spinola, 1838 is reported for the first time from Iran. As a result, four subgenera of the genus \textit{Coelioxys} including \textit{Allocloeoxys}, \textit{Boreocoelioxys}, \textit{Coelioxys} and \textit{Liothyrapis} have been reported from Iran so far. \textit{Allocloeoxys} is one of the large subgenera of genus \textit{Coelioxys} with 75 described species and is numerically the most diverse in the world (Ascher and Pickering, 2013), including the Palaearctic and Nearctic regions from Europe to China and Taiwan; to the south it occurs in all of Africa and southern Asia (Michener, 2007). With three new records, this subgenus includes 12 species in Iran. Among them, \textit{Coelioxys (Allocloeoxys) semenowi} has restricted distribution and occurs in the northern Asia (Warncke, 1992). The host of \textit{C. semenowi} is unknown. The species was collected in Malard by Malaise trap where a large number of an unidentified species of genus \textit{Megachile (Eutricharea)} also was captured at the same time. Hence, it seems that \textit{C. semenowi} may parasitize \textit{Megachile (Eutricharea)} sp.

The subgenus \textit{Boreocoelioxys} has 37 described species in the world (Ascher and Pickering, 2013), including America (from northern Canada to Costa Rica, and from the Atlantic to the Pacific coast) and Eurasia (from Europe to Japan) (Michener, 2007). Unlike subgenus \textit{Allocloeoxys} that occurs in the old world, subgenus \textit{Boreocoelioxys} has a Holarctic distribution. Considering \textit{Coelioxys (Boreocoelioxys) inermis} as new record species, this subgenus has three species in Iran. \textit{Coelioxys (B.) inermis} has widely distributed from Europe to East Asia (Amiet et al., 2004), where its hosts including \textit{Megachile (Megachile) centuncularis} (Linnaeus, 1758), \textit{Megachile (Megachile) versicolor} Smith, 1844, \textit{Megachile (Megachile) alpicola} Alfken, 1924 and \textit{Megachile (Megachile) lapponica} Thomson, 1872 are widely distributed (Ascher and Pickering, 2013). Two latter species are not reported for Iranian megachilid fauna. Henceforth, we expect to report the species from Iran, particularly \textit{M. alpiloca} that previously was reported from Turkey and Caucasus (Ascher and Pickering, 2013), the neighbor countries to Iran.

Ascher and Pickering (2013) listed 20 species of subgenus \textit{Coelioxys} in the world. Like subgenus \textit{Boreocoelioxys}, the subgenus is distributed in Holarctic region (Michener, 2007). With \textit{Coelioxys (Coelioxys) quadridentata} as a new record species, this subgenus contains three species in Iran so far. Among its various host species, the anthidiine bee \textit{Trachusa (Trachusa) byssina} (Panzer, 1798) is not reported for Iranian fauna (Ascher and Pickering, 2013). However, this host has previously been reported from Turkey and Armenia, at neighboring Iran. So, presence of \textit{T. byssina} in Iran is expected.
Figures 1-13. Female and male lateral habitus: 1- Coelioxys acanthura (male), 2- Coelioxys afra (female), 3- Coelioxys afra (male), 4- Coelioxys brevis (male), 5- Coelioxys emarginata (male), 6- Coelioxys haemorrhhoa (male), 7- Coelioxys semenowi (female), 8- Coelioxys elongata, 9- Coelioxys inermis (female), 10- Coelioxys inermis (male), 11- Coelioxys conoidea (female), 12- Coelioxys quadridentata (male), 13- Coelioxys decipiens (female).
First records of Coelioxys from Iran

Table 1 Updated checklist of _Coelioxys_ species (Hym., Megachilidae) in Iran.

<table>
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<th>Species</th>
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<td><em>Coelioxys</em> (Allococelioxys) <em>acanthura</em> (Illiger, 1806)</td>
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</tr>
<tr>
<td><em>Coelioxys</em> (Allococelioxys) <em>afra</em> Lepeletier, 1841</td>
<td>Khaghaninia <em>et al.</em> (2010), present study</td>
</tr>
<tr>
<td><em>Coelioxys</em> (Allococelioxys) <em>artemis</em> Schwarz, 2001</td>
<td>Schwarz (2001)</td>
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<tr>
<td><em>Coelioxys</em> (Allococelioxys) <em>brevis</em> Eversmann, 1852</td>
<td>Morice (1921), present study</td>
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<tr>
<td><em>Coelioxys</em> (Allococelioxys) <em>echinata</em> Förster, 1853</td>
<td>Grace (2010)</td>
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<td><em>Coelioxys</em> (Allococelioxys) <em>emarginata</em> Förster, 1853</td>
<td>present study</td>
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<td><em>Coelioxys</em> (Allococelioxys) <em>haemorrhhoa</em> Förster, 1853</td>
<td>Alfken (1927), present study</td>
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<td><em>Coelioxys</em> (Allococelioxys) <em>polycentris</em> Förster, 1853</td>
<td>Grace (2010)</td>
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<td><em>Coelioxys</em> (Allococelioxys) <em>semenowi</em> Morawitz, 1894</td>
<td>present study</td>
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<tr>
<td><em>Coelioxys</em> (Boreocoelioxys) <em>elongata</em> Lepeletier, 1841</td>
<td>Morice (1921), present study</td>
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<td>present study</td>
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<td><em>Coelioxys</em> (Boreocoelioxys) <em>rufescens</em> Lepeletier &amp; Audinet-Serville, 1825</td>
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</tr>
<tr>
<td><em>Coelioxys</em> (Coelioxys) <em>aurolimbata</em> Förster, 1853</td>
<td>Warncke (1992)</td>
</tr>
<tr>
<td><em>Coelioxys</em> (Coelioxys) <em>conoidea</em> (Illiger, 1806)</td>
<td>Morice (1921), Alfken (1935), present study</td>
</tr>
<tr>
<td><em>Coelioxys</em> (Coelioxys) <em>quadridentata</em> (Linnaeus, 1758)</td>
<td>present study</td>
</tr>
<tr>
<td><em>Coelioxys</em> (Liothyrapis) <em>decipiens</em> Spinola, 1838</td>
<td>present study</td>
</tr>
</tbody>
</table>

_Coelioxys_ (Liothyrapis) with 22 described species (Ascher and Pickering, 2013) is an old world subgenus that occurs throughout Africa, northward to the eastern Mediterranean basin, thence eastward to the Trans-Caspian region and through India to Southeast Asia and Indonesia (Michener, 2007). Only one species (i.e. _L. decipiens_) is reported from eastern Mediterranean and the Middle East (Grace, 2010). _Megachile_ (Pseudomegachile) _nigripes_ Spinola, 1838 as a host for the cleptoparasitic bee is not reported for Iranian megachilid fauna. With regard to presence of the host in Turkey, we expect that _M. nigripes_ should be present in Iran.

Among 15 subgenera of genus _Coelioxys_, 6 subgenera including _Allococelioxys_, _Boreocoelioxys_, _Coelioxys_, _Liothyrapis_, _Mesocoelioxys_, _Torridapis_ occurred in eastern hemisphere (Michener, 2007). Although there are some species of first four subgenera in Iran, monotypic subgenus _Mesocoelioxys_ merely are reported from eastern Mediterranean and _Torridapis_ are distributed in Africa, Oriental and Australia (Warncke, 1992; Gupta, 1993; Wu, 2006; Grace, 2010).

Faunistic and taxonomic studies are first steps towards conservation of the bee fauna. Moreover, declines in bees have prompted much justified concern over the potential impacts on food production and ecosystem stability (Biesmeijer _et al._, 2006). With regard to role of cleptoparasitic bees, recently Sheffield _et al._, (2013) indicated that diversity and abundance of cleptoparasites in relation to all bees is indicative of status of the total bee and healthy communities. Therefore, studies of cleptoparasitic bees may closely track bee diversity and abundance.

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J. Crop Prot.

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مطالعه مقدماتی زنبورهای کلپتوپارازیت جنس Coelioxys (Hymenoptera: Megachilidae) در شمال ایران به‌همراه گزارش شش رکورد جدید

این مطالعه به‌منظور بررسی زندگی‌محیطی و رفتار زنبورهای کلپتوپارازیت جنس Coelioxys (Hymenoptera: Megachilidae) در شمال ایران و به‌همراه گزارش شش رکورد جدید انجام شده است. به‌منظور بررسی این مطالعه، تعدادی از زنبورهای کلپتوپارازیت در مناطق مختلف شمال ایران بررسی شدند. نتایج نشان دادند که این زنبورها به‌همراه گزارش شش رکورد جدیدی به‌عنوان گزارش جدید، فو

چکیده: مطالعه فون زنبورهای خاواده Megachilidae در شمال ایران در سال‌های 1390-1399 مانند به شناسایی یا زه گونه‌های Coelioxys Latreille و زه جنس‌های Allocoelioxys و Coelioxys (2 گونه) و Borecoelioxys (1 گونه) برای اولین بار از ایران گزارش می‌شود. در بررسی زنبورهای کلپتوپارازیتی کلید این گونه‌ها به‌منظور شناسایی گونه‌های کلپتوپارازیتی که از ایران گزارش شده‌اند ارائه شده است.

واژگان کلیدی: Coelioxys, زنبور کلپتوپارازیت، Megachilidae, Megachilini, گزارش جدید، فو