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## FRUIT FLIES OF THE GENUS *CAMPIGLOSSA* (DIPTERA, TEPHRITIDAE) IN IRAN, WITH THE KEY TO SPECIES

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**Fruit Flies of the Genus *Campiglossa* (Diptera, Tephritidae) in Iran, with the Key to Species.** Mohamadzade Namin, S., Nozari, J. — Seven species of *Campiglossa* occurring in Iran are reviewed, *Campiglossa grandinata* (Rondani) is recorded for the first time from Iran (Fars Province) and *Cichorium intybus* L. (Asteraceae) recorded as a new host plant for *Campiglossa producta*. A key to species is provided.

**Key words:** Diptera, Tephritidae, *Campiglossa*, Iran, key to species.

**Мухи-пестрокрылки рода *Campiglossa* (Diptera, Tephritidae) в Иране, с таблицей для определения видов.** Мохаммадзаде-Намин С., Нозари Дж. — Обзор видов *Campiglossa*, встречающихся в Иране. *Campiglossa grandinata* (Rondani) впервые зарегистрирован для Ирана (пров. Фарс), а *Cichorium intybus* L. (Asteraceae) впервые указан как кормовое растение *Campiglossa producta*. Составлена иллюстрированная таблица для определения видов.

**Ключевые слова:** Diptera, Tephritidae, *Campiglossa*, Иран, таблица для определения видов.

### Introduction

The genus *Campiglossa* Rondani, 1870 with about 90 described species is the second largest genus of the family Tephritidae in the Palaearctic Region (Norrbom et al., 1999; Korneyev, 1990, 1995; 2000; 2004; Merz, 2000). In the Palaearctics, it was preliminary revised by Korneyev (1990) for the Eastern Palaearctic and Merz (1994) for the Western Palaearctic fauna. In addition, Sueyoshi (2000) discussed the phylogeny of the *Campiglossa* group of genera. Fruit flies of the genus *Campiglossa* can be recognized by the combination of 2 frontal setae, 2 pairs of scutellar setae; apical scutellar setae less than half as long as basal seta, proboscis with elongate labellum, dorsocentral setae on thorax near to transverse suture; black or white posterior notopleural seta, white anepimeral setae, reticulated wing pattern, large hyaline spots in the wing medial part forming triangle: three spots at costal margin, two in  $r_{2+3}$  cell and one apical (posteriormost) spot at base of  $r_{4+5}$  cell; the shape of the last is a key character; phallus with spinulose preglans, and the glans with the acrophallus fused with sclerotized preputium walls to form the so-called “rostrum” of various shape, which is characteristic for groups of species (see Munro, 1957; Korneyev, 1990; Merz, 1994).

During studies on tephritid flies fauna, *Campiglossa grandinata* (Rondani) was collected from Fars province of Iran. Before this study, five species of *Campiglossa* have been recorded from different provinces of Iran. Zaitzev (1947) reported *Campiglossa producta* (Loew, 1844) from Tabriz; Dirlbek (1980) added *C. absinthii* (Fabricius, 1805) to the list from Mazandaran province. Recently, *C. difficilis* (Hendel, 1927), *C. loewiana* (Hendel, 1927) and *C. misella* (Loew, 1869) have been recorded from Iran by different authors (Mohamadzade Namin et al., 2010; Mohamadzade Namin, 2011; Gharejedaghi et al., 2011).

### Material and methods

The specimens examined in this study were collected by sweeping net and deposited in private collection of the first author (SMNC). Morphological terminology follows White et al. (1999). Photographs of external characters were taken with digital camera by the first author at the I. I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kyiv, Ukraine (SIZK).

***Campiglossa absinthii*** (Fabricius, 1805) (fig. 1–3)

**Material examined.** East Azerbaijan: Aynalu; 38°39' N 46°15' E, 1272 m, 2.06.2009, 1 ♂, 1 ♀ (Khaghaninia).

**Distribution.** Iran: Mazandaran, East Azerbaijan; **General:** N. & Cent. Europe to Siberia; Israel, India, China and Taiwan (Norrbom et al., 1999).

**Diagnosis.** Posterior notopleural, anepisternal, katepisternal, and anepimeral setae white, femora either entirely yellow (fig. 1–2) or with basal one-third darkened; wing pattern rather pale,  $r_{2+3}$  apex with one large spot, base of  $r_{4+5}$  with large rounded spot; cell br with 2 hyaline rounded spots; stigma with one hyaline spot (fig. 3). Phallus glans with thickened ovoid rostrum (Korneyev, Ovtshinnikova, 2004: fig. 293, 3). Oviscape shorter than 3 preceding abdominal tergites.

**Comments.** This species is common in Europe, but very local in Iran. Larvae feed in flower heads of various wormwoods, first of all, absinth (*Artemisia absinthii* L., *A. vulgaris* L.), which occur mainly in the North-Western Iran. See also comments on *C. misella*.

***Campiglossa difficilis*** (Hendel, 1927) (fig. 4–11)

**Material examined.** Tehran: Roudehen (collected at light trap) 22.06.2009, 1 ♂; Haraz road, 5 km NE Abali, 35°50' N, 51°58' E, 2350 m, 30.10.2009, 2 ♂, 2 ♀; Mazandaran: Haraz road, Rineh, South mountainside of Damavand, 35°52' N, 52°06' E, 2500 m, 5.06.2011, 3 ♂, 1 ♀; Qazvin: Khoznan, 36°07' N, 50°32' E, 1630 m, 12.05.2010, 1 ♂ (Mohamadzade leg.).

**Distribution.** Iran: Tehran, Mazandaran, Qazvin. **General:** Throughout Europe, Russia, Syria, Iraq, Afghanistan, Kirghizia and Mongolia (Norrbom et al., 1999; Korneyev, Dirlbek, 2000; Merz, Korneyev, 2004).

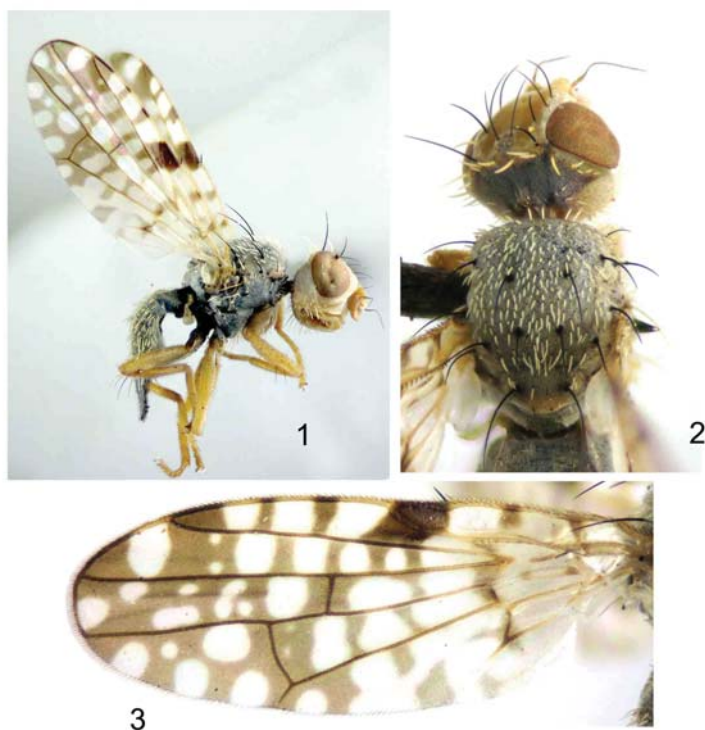


Fig. 1–3. *C. absinthii*. 1 — ♀, habitus, right; 2 — mesonotum, dorsally; 3 — wing (SIZK).

Рис. 1–3. *C. absinthii*. 1 — ♀, общий вид, справа; 2 — среднеспинка, сверху; 3 — крыло (SIZK).

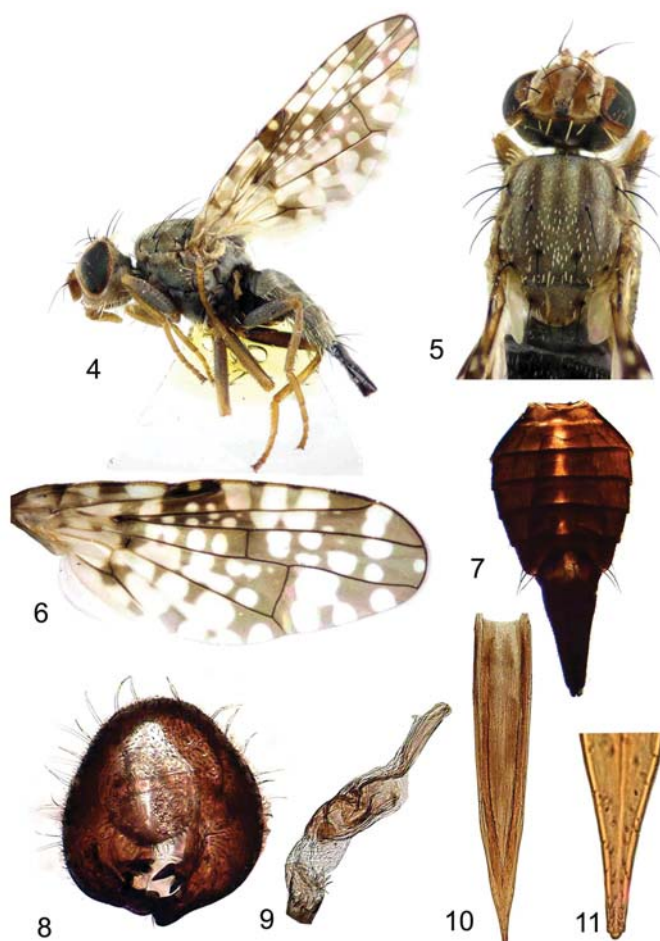


Fig. 4–11. *C. difficilis*. 4 — ♀, habitus, left; 5 — mesonotum, dorsally; 6 — wing (SIZK); 7 — abdomen; 8 — epandrium; 9 — glans; 10 — aculeus, ventrally; 11 — same, apex, enlarged (SMNC).

Рис. 4–11. *C. difficilis*. 4 — ♀, общий вид, слева; 5 — среднеспинка, сверху; 6 — крыло (SIZK); 7 — брюшко; 8 — эпандрий; 9 — гланс; 10 — вершинный членок яйцеклада, вентрально; 11 — то же, вершина, увеличено (SMNC).

**Diagnosis.** Femora black in basal part (fig. 4). Wing pattern reticulated, Cell br with 3 hyaline rounded spots; Stigma with one hyaline spot (fig. 6). Posterior notopleural seta black, mesonotum sometimes with brownish longitudinal bands (fig. 4–5). Oviscape, as long as 3 preceding abdominal tergites (fig. 7). Epandrium as in fig. 8. and glans as in fig. 9. Length of aculeus 6 times as long as wide and with one pair of distinct steps at apex (fig. 10–11).

**Comments.** This species is restricted to Northern Europe and mountain areas, and local in Iran. Larvae feed in flower heads of dandelions (*Taraxacum*). Host plants in Iran unknown.

#### *Campiglossa grandinata* (Rondani, 1870) (fig. 12–16)

**Material examined.** Fars: 10 km NW Saadat shahr, 30°12.7' N, 53°02.7' E, 2500 m, 15.05.2013, 1 ♂ (Mohamadzade leg.).

**Distribution. General:** n. & cent. Europe, Russia, Kazakhstan, Mongolia (Norrbohm et al., 1999). New record for Iran.

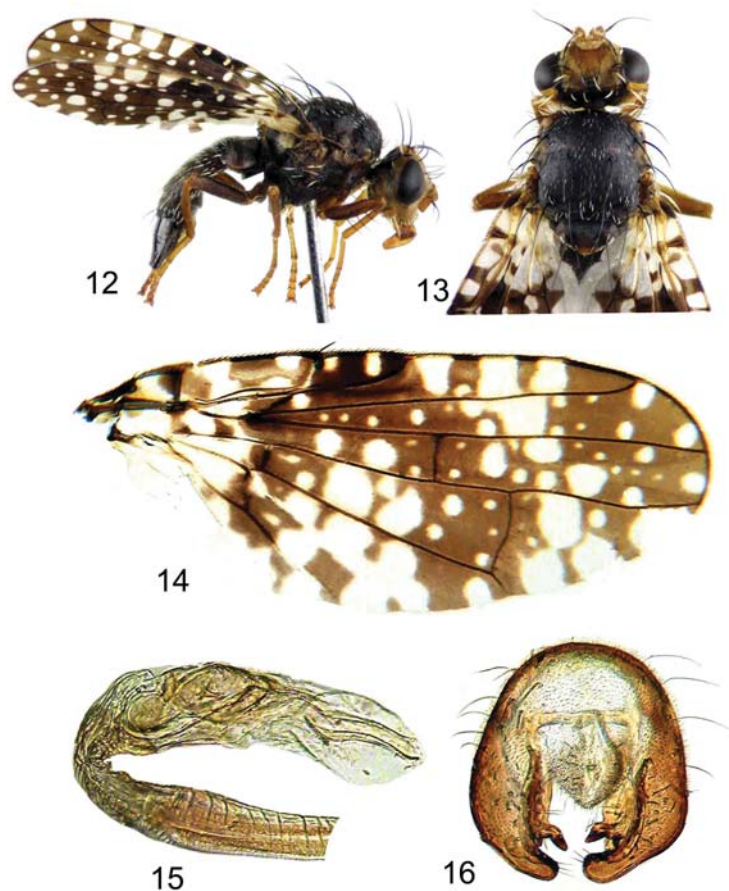


Fig. 12–16. *C. grandinata*. 12 — ♀, habitus, right; 13 — mesonotum, dorsally (SIZK); 14 — wing; 15 — glans; 16 — epandrium (SMNC).

Рис. 12–16. *C. grandinata*. 12 — ♀, общий вид, справа; 13 — среднеспинка, дорсально (SIZK); 14 — крыло; 15 — гланс; 16 — эпандрий (SMNC).

**Diagnosis.** Posterior notopleural seta black (fig. 12–13), Wing pattern reticulated, with 2 hyaline spots in cell br; apex of  $r_{2+3}$  with 2 isolated spots, base  $r_{4+5}$  with one oval spot, Stigma with two hyaline spots; apical hyaline spot of triangle small (fig. 14). Glans as in fig. 15 and epandrium as in fig. 16.

**Comments.** This species occurs throughout the Palearctic Region, predominantly in the mountain lowlands. Larvae induce galls on shoots of *Solidago virgaurea* L.

#### *Campiglossa loewiana* (Hendel, 1927) (fig. 17–20)

**Material examined.** East Azerbaijan: Ajabshir, Galachay, 37°31' N, 46°07' E, 1469 m, 24.03.2010, 4 ♂, 1 ♀ (Gharajedaghi leg.).

**Distribution.** Iran: East Azerbaijan; **General:** Throughout Europe, Russia, Mongolia and China (Norrbom et al., 1999).

**Diagnosis.** Posterior notopleural seta white, anepisternal and katepisternal setae black; femora at mostly black (fig. 17); wing pattern with 2 hyaline spots in cell br; apex of  $r_{2+3}$  with 2 isolated spots, base of cell  $r_{4+5}$  with one oval spot (fig. 19); frons fine trichose. Oviscape as long as 2 preceding abdominal tergites; length of aculeus about 4.2 times as long as wide (fig. 20).



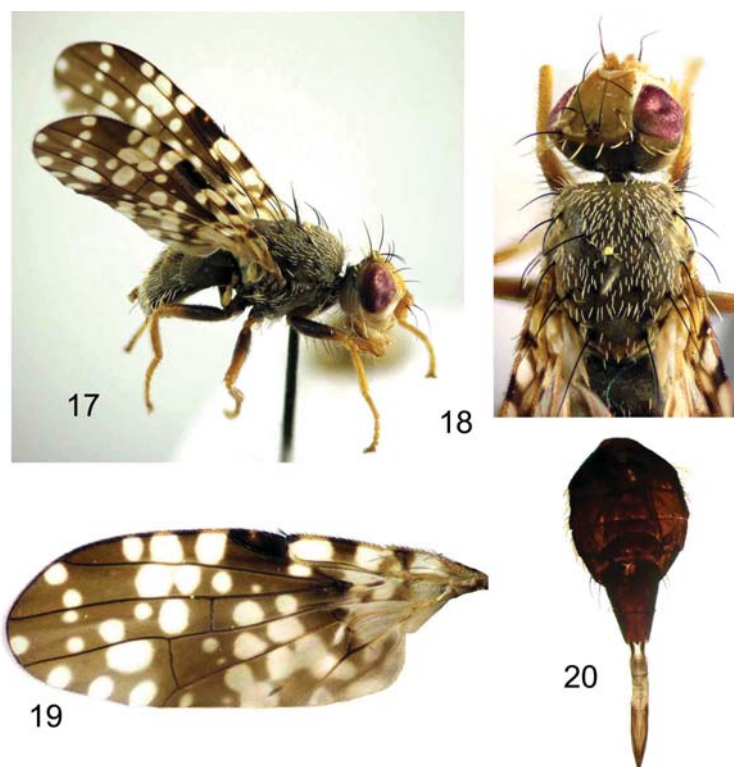


Fig. 17–20. *C. loewiana*. 17 — ♀, habitus, right; 18 — mesonotum, dorsally; 19 — wing (SIZK); 20 — abdomen (SMNC).

Рис. 17–20. *C. loewiana*. 17 — ♀, общий вид, справа; 18 — среднеспинка, дорсально; 19 — крыло (SIZK); 20 — брюшко (SMNC).

**Comments.** This species occurs locally in the Palearctic Region. Larvae feed in flower heads of *Solidago virgaurea* L. and *Aster amellus* L. (Merz, 1994).

***Campiglossa misella*** (Loew, 1869) (fig. 21–26)

**Material examined.** **Tehran:** 5 km North East Abali, 2360 m, 35°50' N, 51°58' E, 29.08.2008, 1 ♂; **Mazandaran:** Haraz road, Rineh, South mountainside of Damavand, 35°52' N, 52°06' E, 2500 m, 24.07.2010, 2 ♀; (Mohamadzade leg.).

**Distribution.** **Iran:** Tehran, Mazandaran, East Azerbaijan. **General:** throughout Europe, China (Norrbohm et al., 1999).

**Diagnosis.** Posterior notopleural seta black, femora black (fig. 21–22); Stigma with one hyaline spot; cell br with 2 hyaline spots (fig. 23); Ventral margin of the head shorter than head height (fig. 26); Mesonotum with three brownish longitudinal bands (fig. 22). Oviscape shorter than 4 posteriormost preabdominal tergites; apex of aculeus with one pair of not very prominent steps (fig. 25).

**Comments.** This species is common throughout Palearctics, from Europe to China, but very local in Iran. Larvae feed in flower heads of various wormwoods, first of all, mugwort and absinth (*Artemisia vulgaris* L., *A. absinthii* L.), which occur mainly in the North-Western and Northern Iran. See also comments on *C. absinthii*.

***Campiglossa producta*** (Loew, 1844) (fig. 27–34)

**Material examined.** **Alburz:** Hasan joon village, Taleghan, 2000 m, 36°12' N, 50°45' E, 1 ♂, 10.09.2009 (Mohamadzade leg.); **Ardebil:** Namin, reared from *Lactuca serriola*, 1 ♂, 1 ♀; Namin, coll.: 14.07.2010, exit: 24.07.2010, 3 ♂, 4 ♀; Sabalan mountain, 2750 m, 38°19' N, 47°50' E, 14.07.2010, Namin, 1 km W Namin, 14.07.2010, 2 ♂; 2 ♀; Namin, 20 km E Namin, 2110 m, 38°25' N, 48°32' E, reared from flower heads of *Cichorium*

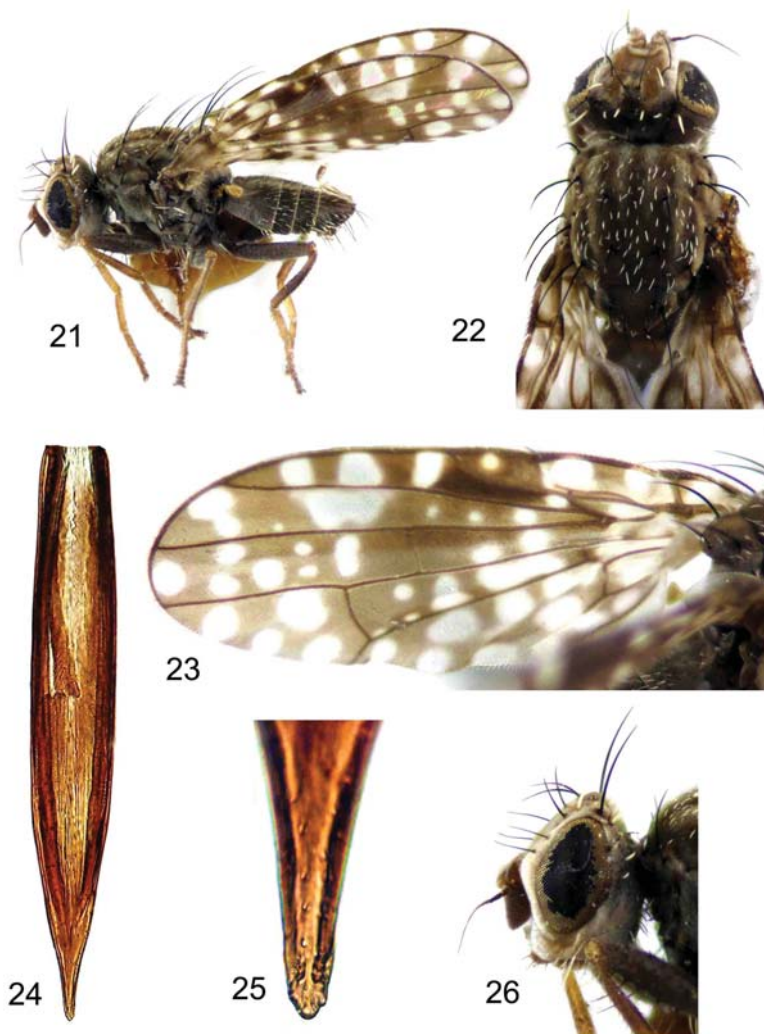


Fig. 21–26. *C. misella*. 21 — ♂, habitus, left; 22 — mesonotum, dorsally; 23 — wing (SIKZ); 24 — aculeus, ventrally; 25 — same, enlarged (SMNC); 26 — head (SIKZ)

Рис. 21–26. *C. misella*. 21 — ♂, общий вид, справа; 22 — среднеспинка, дорсально; 23 — крыло (SIKZ); 24 — вершинный членок яйцеклада, вентрально; 25 — то же, увеличено (SMNC); 26 — голова (SIKZ).

*intybus* L., coll.: 29.07.2013, exit: 7.08.2013, 2 ♂, 2 ♀; same, 6.06.2014, 1 ♂, 1 ♀; (Mohamadzade & Najarpour leg.); **Charmahal & Bakhtiari**: Farsan, Chelgerd, Sheykh Alikhan, 2800 m, 32°31' N, 50°00' E, 5.06.2013, 2 ♂, 3 ♀; Farsan, Chelgerd, Sheykh Alikhan waterfall, 2450 m, 32°30' N, 50°04' E, 5.06.2013, 2 ♂; Shahre kord, Choghakhor lake, 2600 m, 31°53' N, 50°58' E, 8.06.2013, 1 ♀; **Fars**: Shiraz, Dasht Arjan, 2070 m, 29°40' N, 52°00' E, 24.05.2014, 1 ♂, 1 ♀; **Isfahan**: **Samirom, Abmalakh**, 2100 m, 31°10' N, 51°21' E, 27.05.2014, 1 ♂, 2 ♀; **Kohkiloyeh & Boyerahmad**: Sisakht, 2115, 30°51' N, 51°28' E, 25.05.2014, 3 ♂, 9 ♀; Sisakht, Bijan pass, 3300 m, 30°52'29" N, 51°31'26" E, 26.05.2014, 8 ♂, 5 ♀; **Kurdistan**: Sanandaj, Abidar mountain, Mamatkeh, 1660 m, 35°18' N, 46°57' E, 4.06.2009, 1 ♂; Saral, Ghojr, 2110 m, 35°45' N, 46°58' E, 6.06.2009, 1 ♂, 1 ♀; Sanandaj-Marivan road, Jhavroud, 1370 m, 35°14' N, 45°29' E, 7.06.2009, 1 ♂; Uraman, Marivan, 2200 m, 7.06.2009, 1 ♂; Bijar, 2000 m, reared from flower heads of *Lactuca serriola* (new host plant), coll.: 20.07.2009, exit: 30.07.2009, 1 ♂, 1 ♀; Sanandaj-Marivan road, Jhavroud, 1370 m, 35°14' N, 45°29' E, 7.06.2009, 1 ♂; Sanandaj, Abidar mountain, Mamatkeh, 1660 m, 35°18' N, 46°57' E, 17.06.2010, 12 ♂, 1 ♀; Saral, Ghojr, 2110 m, 35°45' N, 46°58' E, 18.06.2010, 1 ♂, 2 ♀; Marivan, Drzli, 1600 m, 35°21' N, 46°09' E, 16.06.2014, 12 ♂ (Mohamadzade leg.); **Markazi**: Arak, Moradabad, 30.05.2009, 1 ♀ (Hajighorbani leg.) (IAUA); **Mazandaran**: Haraz road, Rineh, southern mountainside of Damavand, 35°52' N, 52°06' E, 2500 m, 24.07.2010, 1 ♀; same, 9.07.2014, 1 ♀; **Khuzestan**: Dezful, 20 km w Saland, 32°29' N, 48°48' E, 450 m, 25.03.2013, 1 ♀; **West Azerbaijan**: Ziveh, 20km W Ziveh, 2630 m, 37°08' N, 44°52' E, 31.07.2011, 2 ♂; same, 17.06.2014, 3 ♀; Qazemloo valley, 1500 m, 37°18' N, 45°07' E, 19.06.2014, 2 ♂ (Mohamadzade leg.).

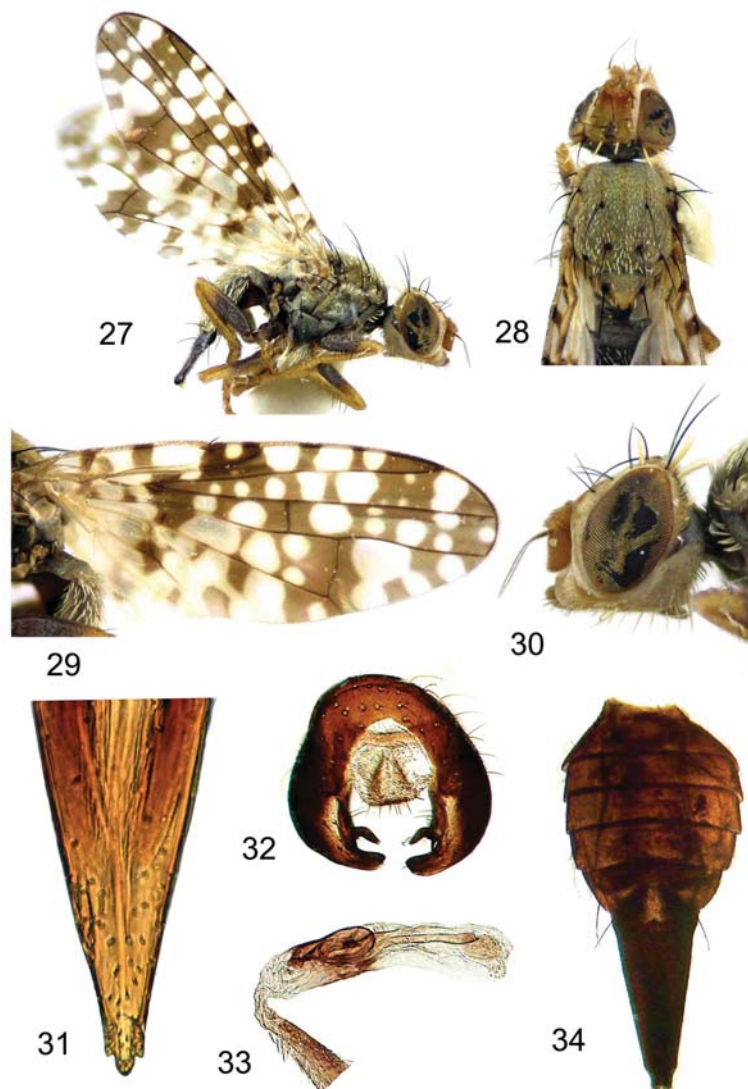


Fig. 27–34. *C. producta*. 27 — ♀, habitus, right; 28 — mesonotum, dorsally; 29 — wing; 30 — head (SIZK); 31 — aculeus apex, ventrally, enlarged; 32 — epandrium; 33 — glans; 34 — abdomen (SMNC);

Рис. 27–34. *C. producta*. 27 — ♀, общий вид, справа; 28 — среднеспинка, дорсально; 29 — крыло; 30 — голова (SIZK); 31 — верхний членик яйцеклада, верхина, вентрально (увеличено); 32 — эпандрий; 33 — гланс; 34 — брюшко (SMNC);

**Distribution.** **Iran:** Alburz, Ardabil, Charmahal & Bakhtiari, Fars, Golestan, Isfahan, Khuzestan, Kohkiluyeh & Boyerahmad, Kurdistan, Lorestan, Markazi, Mazandaran, Tehran, West and East Azerbaijan. **General:** N Africa, Canary Is., Cent. and S. Europe, Middle Asia, Israel, Syria, Jordan, Iraq and Afghanistan (Norrbon et al., 1999; Korneyev, Dirlbek, 2001).

**Diagnosis.** Posterior notopleural seta black, femora black in basal part (fig. 27–28); stigma with one hyaline spot; cell br with 2 hyaline spots (fig. 29); ventral margin of the head longer than head height (fig. 30); in Iranian population mesonotum without brownish longitudinal bands (fig. 28). Oviscape as long as 3 preceding abdominal tergites (fig. 34). Epandrium as in fig. 32 and glans as in fig. 33. Aculeus about 6 times as long as wide; apex of aculeus with one pair distinct steps (fig. 31).

**Comments.** This is apparently the commonest species of *Campiglossa* occurring in Iran. In the other parts of the Palearctic Region, it has been reared from the flower heads of various Cichorieae plants: *Chondrilla*, *Crepis*, *Hieracium*, *Hypochoeris*, *Lactuca*; *Leontodon*, *Picris*, *Scorzonera*, *Sonchus*, and *Taraxacum* (Merz, 1994; V. A. Korneyev, pers. comm.). In Iran, it is reared from *Lactuca serriola* L. and *Cichorium intybus* L.

***Campiglossa* sp.** (fig. 35–36)

**Material examined.** West Azerbaijan: Ziveh, 20 km w Ziveh, 2630 m, 37°08' N, 44°52' E, 31.08.2013, 1 ♂, 1 ♀ (Mohamadzade leg.).

**Remarks.** This species is similar to *C. difficilis* in having black posterior notopleural seta, stigma with one hyaline spot and cell br with 3 hyaline spots, but wing pattern is pale brown.

This specimen belongs to an undescribed species and group of species, associated with the genus *Senecio* (Asteraceae) in subalpine meadows in Central Asia (V. A. Korneyev, pers. comm.) and previously unknown from the Middle East. As the species is represented by a few specimens, we do not formally describe it here. It will be described elsewhere (V. A. Korneyev, Mohamadzade Namin, in prep.).

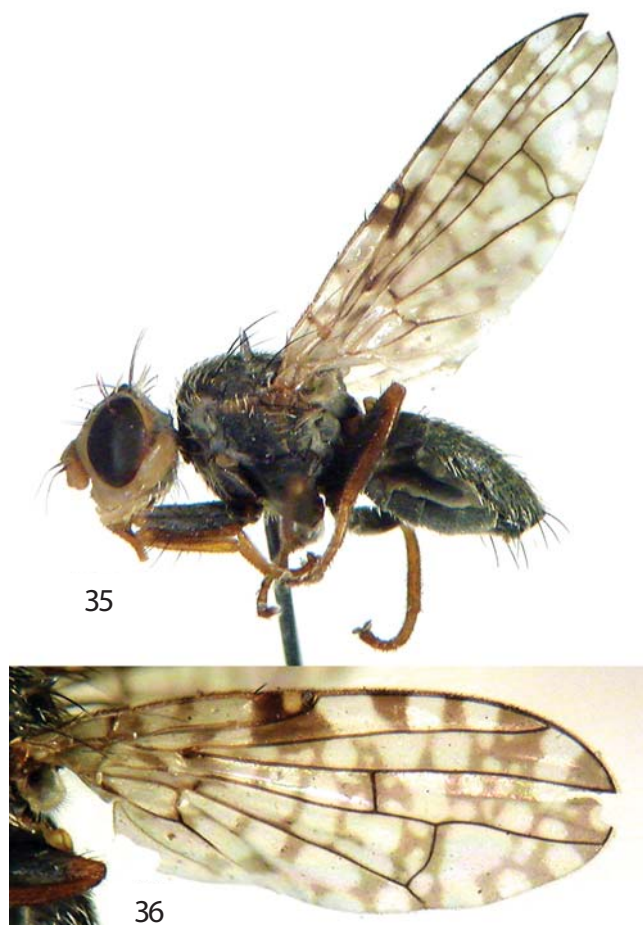


Fig. 35–36. *Campiglossa* sp. 35 — ♀, habitus, right; 36 — wing (SMNC).

Рис. 35–36. *Campiglossa* sp. 35 — ♀, общий вид, справа; 36 — крыло (SMNC).



Key to Species of *Campiglossa* occurring in Iran

1. Posterior notopleural seta white (fig. 1, 17); frons with fine setulae above lunule. Glans with compound, strongly curved rostrum. .... 2
- Both notopleural setae unicolor, black; frons bare. Glans with simple, tubular or flat, rostrum. .... 3
2. Femora completely yellow (fig. 1); apex of cell r2+3 with one large spot, base of r4+5 with wide, subquadrate hyaline spot (fig. 3). .... *C. absinthii*
- Femora at least in basal part black (fig. 17); apex of cell r2+3 with two isolated spots, base r4+5 with one oval spot (fig. 19) ..... *C. loewiana*
3. Cell br with 3 hyaline rounded spots; stigma with one hyaline spot (fig. 6). .... 4
- Cell br with 2 hyaline rounded spots; other characters variable. .... 5
4. Wing pattern dark brown (fig. 6); mesonotum with three brownish longitudinal bands (fig. 5); oviscapae as long as 3 aculeus 6 times as long as wide and with one pair of distinct steps at apex. .... *C. difficilis*
- Wing pattern pale brown (fig. 36); mesonotum without brownish longitudinal bands. *Campiglossa* sp.
5. Stigma with two hyaline spots; apical hyaline spot of triangle small (triangle of large hyaline spots in the wing medial part: 3 at front margin, 2 in r2+3 cell and apical, at base of r4+5 cell) (fig. 14); base of mesonotal setae with brownish spots. .... *C. grandinata*
- Stigma with one hyaline spot; Apical hyaline spot in triangle large (except male of *C. misella*). .... 6
6. Ventral margin of the head longer than head height (fig. 30); male: basalmost hyaline spot in cell r1 large; length of aculeus about 6 times as long as wide. .... *C. producta*
- Ventral margin of the head shorter than head height (fig. 26); male: basalmost hyaline spot in cell r1 small (fig. 23); length of aculeus 7 times as long as wide (fig. 24). .... *C. misella*

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