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A REVIEW OF THE GENUS *CHEILOSIA* (DIPTERA, SYRPHIDAE) FROM IRAN

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A Review of the Genus *Cheilosia* (Diptera, Syrphidae) from Iran. Khaganinia, S., Kazerani, F. — Based on study of references and specimens collected by the authors in the East Azarbaijan Province during 2010–2012, 14 species of *Cheilosia* Meigen, 1822 known from Iran are listed. Four of them, *Cheilosia mutabilis* (Fallién, 1817), *C. nigripes* (Meigen, 1822), *C. variabilis* (Panzer, 1798), and *C. vulpina* (Meigen, 1822) are recorded from Iran for the first time. Diagnostic characters and geographical distribution of the species are provided. An illustrated key to Iranian *Cheilosia* is given.

Key words: *Cheilosia*, Syrphidae, key, new records, Iran.

Обзор рода *Cheilosia* (Diptera, Syrphidae) из Ирана. Хаганинья С., Казерани Ф. — На основании изучения литературных данных и материалов, собранных авторами в провинции Восточный Азербайджан в 2010–2012, представлен список 14 видов *Cheilosia* Meigen, 1822, известных из Ирана. Четыре из них: *Cheilosia mutabilis* (Fallién, 1817), *C. nigripes* (Meigen, 1822), *C. variabilis* (Panzer, 1798) и *C. vulpina* (Meigen, 1822), отмечены впервые для Ирана. Приведены диагностические признаки и сведения о распространении видов. Составлена иллюстрированная таблица для определения видов *Cheilosia,* обитающих в Иране.

Ключевые слова: *Cheilosia*, Syrphidae, таблица для определения видов, новые находки, Иран.

Introduction

The genus *Cheilosia* Meigen, 1822 belongs to the monophyletic tribe Rhingiini of the subfamily Eristalinae, with more than 300 Palaearctic species (Ståhls, Nyblom, 2000; Ståhls et al., 2004; Thompson et al., 2010). It is one of the largest genera in the world and the largest Palaearctic genus of the hoverflies (Vujić et al., 2013).

Cheilosia larvae are mostly phytophagous, with some species feeding on the sap and cambium of coniferous trees (subgenus *Neocheilosia* Barkalov, 1983) or fungivorous (Vujić, 1996; Rotheray, 1993; Stuke, 2000). Some phytophagous species are known to be pests of crops, for instance *C. vulpina* (Meigen, 1822) infesting up to 50 % of artichoke (*Cynara scolymus*) crops in Northern France in the 1980s (Rotheray, Gilbert, 2011). *C. gigantea* (Zetterstedt, 1838) was reported to feed as larva in *Rumex* sp., *C. rufimana* (Becker, 1894) oviposits on *Polygonum bistorta*, and larvae of *C. variabilis* (Panzer, 1798) feed in the roots of *Scrophularia nodosa* (Dušek, 1962). On another hand, larvae of *C. urbana* (Meigen, 1822) are host-specific and efficient agents for biological control of *Hieracium* spp. (Grosskopf et al., 2002).

Adults of *Cheilosia* are commonly feeding on flowers; in early spring on flowers of *Salix* spp. and during the summer visiting various yellow and white flowers (Ståhls et al., 2008).

Cheilosia are blackish hoverflies, rarely with silverish spots, or seldom with greenish or purple sheen (Van Veen, 2004). Some species are good mimics of Hymenoptera (Ståhls et al., 2004).

Identification of *Cheilosia* species is often difficult because of the presence of cryptic species and lack of conspicuous characters. The most recent and important publications on this genus are as follows: Barkalov (2002) classified *Cheilosia* into 13 subgenera; Van Veen (2004) distributed the species into 9 groups; Speight (2012) registered 175 European species; Vujić et al. (2013) provided a key to European species of the *C. proxima* species group.

By far, 10 species of *Cheilosia* have been reported from Iran. Gilasian (2005) recorded this genus and six species from Iran and Khaghaninia et al. (2010, 2012) improved the knowledge on this genus by adding 4 species to the last data.

This study aimed to provide a comprehensive taxonomic list of *Cheilosia* species known from Iran.

Material and methods

Studied specimens were collected by the insect net in various habitats of Azarbaijan Province during 2010–2012, located in 37°20.433′ to 38°58.280′ N, 46°1.065′ to 47°37.140′ E and altitude from 391 m to 2900 m; except *C. scutellata* collected from Mazandaran Province (northern Iran). Dissection of the male genitalia followed from Martin (1977) with some modification.

Photographs are based on the collected specimens; no specimens of *C. gigantea* (Zetterstedt, 1838); *C. laticornis* Rondani, 1857 and *C. melanopa* (Zetterstedt, 1843), previously recorded from Iran, were available for study. The materials is deposited in the collection of the Insect Museum of Tabriz University and in the Insect Taxonomy Research Department (Iranian Research Institute of Plant Protection). Distribution of species mostly follows Speight (2011), with minor additions and corrections. Morphological terminology follows that of Van Veen (2004), Stubbs, Falk (2002), and Barkalov (2009).

Results

Fourteen species of the genus *Cheilosia* are known from Iran; of them four, *C. mutabilis* (Fallén, 1817), *C. nigripes* (Meigen, 1822), *C. variabilis* (Panzer, 1798) and *C. vulpina* (Meigen, 1822), are recorded for the first time.

Genus *Cheilosia* Meigen, 1822

Type species: *Eristalis scutellatus* Fallén, 1817.

Diagnosis. The genus *Cheilosia* differs from other Eristalinae genera by the following combination of characters: eye with rim along the facial border; face in both sexes with well-defined facial knob and mouth edge, arista dorsal and hair-like; wing with vein R_{4+5} straight, crossvein r-m before middle of discal cell; blackish species, abdomen oval, parallel-sided, rarely with grayish spots.

Key to the Iranian species of the genus *Cheilosia*

1. Eye bare or with small and sparse hairs. 2
— Eyes haired. 8
2. Legs black, at most tibia pale basally; sternites 2–5 shiny, often in contrast to a dull sternite 1; genitalia as in fig. 2, *f*. ..... *C. nigripes*
— Legs partly pale at least tibia pale at the both ends. 3
3. Arista bare or shorthaired, hairs shorter than basal diameter of arista. 4
— Arista with hairs longer than the diameter of thickend basal part of arista. 6
4. Hind margin of scutellum without bristle. ..... *C. laticornis*
— Hind margin of scutellum with bristle. 5
5. Third antennal segment more than 3 times as long as second segment (fig. 1, *h*). .....*C. lola*
— Third antennal segment less than 3 times as long as second segment (fig. 1, *f*). ..... *C. cumanica*
6. Facial knob slender, in male nearly triangular, in female only occupying 1/3 of the face viewed from above (fig. 1, *b*). ..... *C. mutabilis*
— Facial knob broad from above semicircular. 7
7. Third antennal segment bright red (fig. 3, *b*); anterior anepisternum with hairs along posterodorsal rim; thoracic dorsum with coarse punctuation; genitalia as in (fig. 3, *c*). ..... *C. rufipes*
— Third antennal segment brownish-black (fig. 3, g), anterior anepisternum bare along posterodorsal rim; thoracic dorsum with fine punctuation; genitalia as in (fig. 3, *h*). ..... *C. scutellata*
8. Face with distinct hairs on sides of facial knob. 9
— Face without distinct hairs on sides of facial knob, at most with very short hairs. 12
9. Legs black. 10
— Legs partly pale, at least tibia pale at both ends. 11
10. Eye with long hairs; arista with hairs shorter than diameter of basal thickened part; genitalia as in (fig. 4, *c*). ..... *C. transcaucasica*
— Eye with short hairs; arista with hairs longer than diameter of basal thickened part; genitalia as in (fig. 4, *f*). ..... *C. variabilis*
11. Arista shorter than 3 times as long as third segment; sternites shiny; thoracic dorsum covered with 2 different length of hairs, short brown and many somewhat long black hairs; margin of tergites uniformly covered with white and long hairs. ..... *C. melanopa*
— Arista shorter than 3 times as long as third segment (fig. 4, *h*); sternites dusty; thoracic dorsum covered with equal hairs; tergites with long, white hairs only on front corners of tergites. ..... *C. vulpina*
12. Sternites dusty, female with elongate areas covered with longer hairs on tergites. 13

— Sternites shiny, female without areas with longer hairs on tergites; claws on tarsi pale orange basally and black on apical 1/2 (fig. 3, d–*f*). ..... *C. ruralis*

13. Thoracic and scutellar dorsum with 2 different groups of hairs in length, longer black hairs and shorter pale to dark spots. ..... *C. aerea*

— Thoracic and scutellar dorsum with equal hairs, only some hairs of thoracic dorsum before the scutellum longer. ..... *C. gigantean*

List of *Cheilosia* species known from Iran

Cheilosia* (*Cheilosia*) *aerea Dufour, 1848 (fig. 1, *a–c*)

Material examined. Iran: East Azarbaijan Province: Qaradagh forests, 38°55.601′ N, 46°46.932′ E, 1313 m, 05.07.2011, 3 ♂, 4 ♀; Esparekhan, 37°45.974′ N, 46°24.895′ E, 2572 m, 08.08.2009, 1 ♂, 2 ♀; Kandovan: 37°46.985′ N, 46°15.686′ E, 2341 m, 27.05.2010, 2 ♂, 2 ♀; Oskulu, 38°51.813′ N, 46°50.759′ E, 1667 m, 02.07.2009, 3 ♂, 4 ♀; Horand, 38°53.838′ N, 47°16.988′ E, 1367 m, 05.07.2012, 2 ♂, 4 ♀; Aynali, 38°55.725′ N 46°47.589′ E, 1358 m, 14.07.2010, 3 ♂, 5 ♀; Mekidi, 38°50.487′ N, 46°54.189′ E, 1656 m, 19.08.2011, 3 ♂, 4 ♀; Chichekli, 38°37.169′ N, 46°26.536′ E, 1534 m, 21.07.2012, 5 ♂, 6 ♀; West Azarbaijan Province, Maragheh, 38°20.137′ N, 47°37.234′ E, 1606 m, 31.07.2011, 5 ♂, 2 ♀ (S. Khaghaninia).

Distribution. Poland south to the Mediterranean; from the Netherlands eastwards through much of Central and Southern Europe into European parts of Russia Transcaucasus; Iran (Khaghaninia et al., 2010).

Diagnostic characters. Eye with pale hairs in apical half; third antennal segment entirely or mostly yellowish-orange (fig. 1, *b*); face without distinct hairs (microtrichia not taken into account); median facial tubercle sharply convex; mesoscutum with coarse punctuation; posterior margin of scutellum with black or yellow bristles distinctly more robust than surrounding hairs (fig. 1, *a*); fore coxa without tooth, at least first segment of mid tarsus or bases of tibiae yellowish; male genitalia as in (fig. 1, *c*).

Cheilosia* (*Convocheila*) *cumanica Szilady, 1938 (fig. 1, *d–f*)

Material examined. Iran: East Azarbaijan Province, Qaradagh forests, 38°50.951′ N, 46°51591′ E, 1613 m, 3.07.2010, 3 ♂, 6 ♀; Esparekhan, 37°45.376′ N, 46°25.260′ E, 2650 m, 08.08.2009, 1 ♂, 4 ♀; Kandovan, 37°44.181′ N, 46°19.900′ E, 3005 m, 01.07.2011, 3 ♂, 4 ♀; Oskulu, 38°53.736′ N, 46°48.860′ E, 1859 m, 20.07.2011, 3 ♂, 4 ♀; Horand, 38°58.467′ N, 47°18.198′ E, 1355 m, 05.07.2012, 3 ♂, 2 ♀; Aynali, 38°57.194′ N, 46°43.456′ E, 782 m, 14.07.2010, 3 ♂, 4 ♀; Mekidi, 38°50.864′ N, 46°54.901′ E, 1426 m, 13.07.2009, 3 ♂, 6 ♀; Chichekli, 38°31.367′ N, 46°32.111′ E, 1733 m, 03.07.2011, 6 ♂, 12 ♀; West Azarbaijan Province, Maragheh, 37°27.642′ N, 46°16.259′ E, 1595 m, 23.07.2011, 5 ♂, 10 ♀ (S. Khaghaninia).

Distribution. Balkans (Bosnia-Herzegovina, Macedonia, Montenegro, Serbia) and Carpathians (Romania); Iran (Khaghaninia et al., 2010).

Diagnostic characters. Eyes hairy; third antennal segment orange, darkened above and shorter than 2.5 times as long as second segment; frons broad and convex; face without distinct hairs (microtrichia not taken into account) (fig. 1, *e*); at least first segment of mid tarsus or bases of tibiae yellowish; genitalia as in (fig. 1, *f*).

***Cheilosia* (*Cheilosia*) *gigantea*n** (Zetterstedt, 1838)

Distribution. From From Fennoscandia southwards to the Alps; Germany eastwards through northern and central Europe (plus northern Italy and the former Yugoslavia) into European territory of Russia and from Ukraine to the Caucasus; in Siberia from the Urals to the Pacific coast; Iran (Gilasian, 2005).

Diagnostic characters. Eye with pale hairs in apical half; third antennal segment black; face without distinct hairs (microtrichia not taken into account); median facial tubercle narrower, sharply convex forwards; mesoscutum entirely covered with erected black hairs or with mixed black and yellow hairs through the length; posterior margin of scutellum with black or yellow bristles distinctly more robust than surrounding hairs; fore coxa without tooth, at least 1st segment of mid tarsus or bases of tibiae yellowish.

Cheilosia* (*Convocheila*) *laticornis Rondani, 1857

Distribution. From From Fennoscandia southwards to Iberian Peninsula and from Ireland eastwards through Central and Southern Europe to Turkey and on into European territory of Russia and western Siberia. Also in Northern Africa (Kassebeer, 1998); Iran (Gilasian, 2005).

Diagnostic characters. Eye bare; eye margin below antenna with long hairs, third antennal segment reddish-black; dorsal side of facial knob bare, at most with very short hairs, tibia pale at the both ends, hind margin of scutellum without bristle.

Cheilosia lola Zimina, 1970 (fig. 1, *g–h*)

Material examined. Iran: West Azarbaijan Province, Maragheh, 37°20.721′ N, 46°13.105′ E, 1415 m, 09.08.2012, 1 ♀ (Khaghaninia).

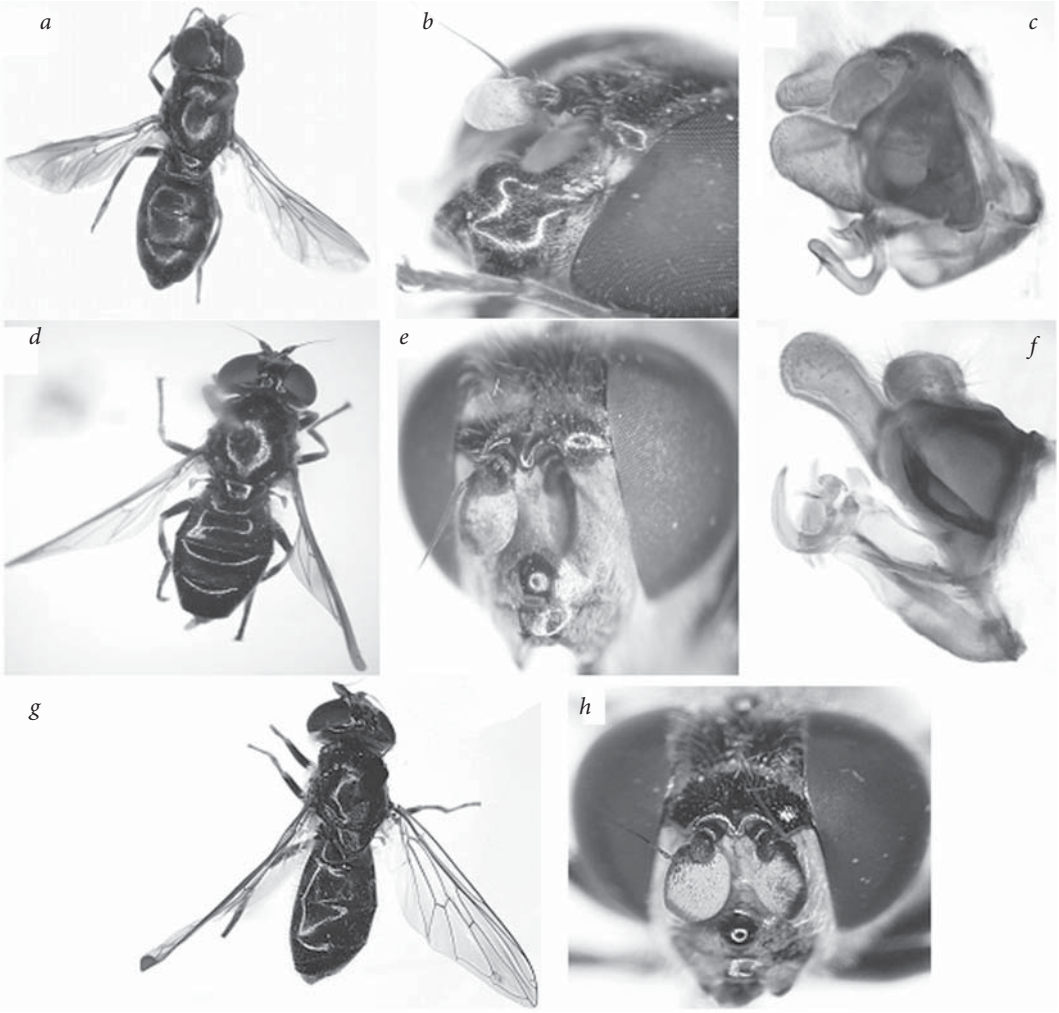

Fig. 1. *Cheilosia aerea* (*a–c*): *a* — dorsal view of female, *b* — lateral view of head of female, *c* — male genitalia; *C. cumanica* (*d–f*): *d* — dorsal view of female, *e* — frontal view of head of female, *f* — male genitalia; *C. lola*, female (*g–h*): *g* — dorsal view, *h* — frontal view of head.

Рис. 1. *Cheilosia aerea* (*a–c*): *a* — самка, вид сверху; *b* — голова самки, латеральный вид, *c* — гениталии самца; *C. cumanica* (*d–f*): *d* — самка, вид сверху, *e* — голова самки, фронтальный вид, *f* — гениталии самца; *C. lola,* самка (*g–h*): *g* — вид сверху, *h* — голова, фронтальный вид.

Distribution. Kirghizia, Iran (Khaganinia et al., 2010).

Diagnostic characters. Eye bare, antenna black, third antennal segment large and covered by brownish microtrichia, antennal socket separated (fig. 1, *h*), sides of facial knob bare; wing hyaline (fig. 1, *g*); legs mostly black, except tibia pale in two sides.

Cheilosia* (*Cheilosia*) *melanopa (Zetterstedt, 1843)

Distribution. Fennoscandia, the Baltic States and mountainous parts of Central Europe south to Italy Bulgaria, Romania and states of the former Yugoslavia; Pyrenees; Iran (Gilasian, 2005).

Diagnostic characters. Face with pale hairs, especially in female, facial tubercle rounded; mesoscutum with short pale and long black hairs; body hairs mostly black, tergites covered with pale hairs laterally and black hairs medially; tibiae brownish basally.

Cheilosia* (*Cheilosia*) *mutabilis (Fallén, 1817) (fig. 2, *a–c*)

Material examined. Iran: East Azarbaijan Province, Horand, 38°54.575′ N, 47°20.241′ E, 1221 m, 05.07.2012, 1 ♂, 3 ♀ (S. Khaghaninia).

Distribution. From Fennoscandia southwards to Iberia, Mediterranean region and North Africa; from Britain eastwards through much of Europe into Turkey and European parts of Russia into western Siberia, Iran (first record).

Diagnostic characters. Eye with pale hairs in apical half; third antennal segment black, without anterodorsal angle, weakly enlarged, antennal sockets separated; face without distinct hairs (microtrichia not taken into account); parafacial narrow, distinctly narrower than half width of third antennal segment (fig. 2, *b*); scutellum with strong black bristles along posterior margin; at least mid tibia in basal third yellow dorsally; fore coxa without tooth, femora black in basal part in female, 2nd–4th segments of fore and mid tarsi yellow or pale brown; male genitalia as in (fig. 2, *c*).

Cheilosia* (*Taeniocheilosia*) *nigripes (Meigen, 1822) (fig. 2, *d–f*)

Material examined. Iran: East Azarbaijan Province, Osculu, 38°51.515′ N, 46°52.400′ E, 1721 m, 20.07.2011, 6 ♂, 3 ♀ (S. Khaghaninia).

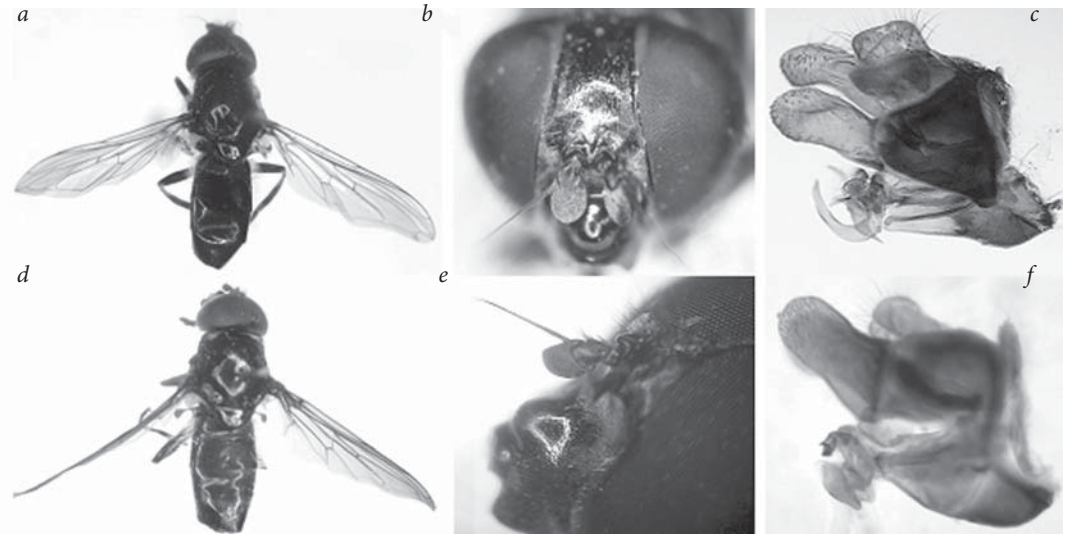

Fig. 2. *Cheilosia mutabilis* (*a–c*): *a* — dorsal view of male, *b* — frontal view of head of female, *c* — male genitalia; *C. nigrips,* male (*d–f*): *d* — dorsal view, *e* — lateral view of head; *f* — genitalia.

Рис. 2. *Cheilosia mutabilis* (*a–c*): *a* — самец, вид сверху, *b* — голова самки, фронтальный вид, *c* — гениталии самца; *C. nigripes,* самец (*d–f*): *d* — вид сверху, *e* — голова, латеральный вид, *f* — гениталии.

Distribution. From Fennoscandia southwards to the Pyrenees and northern Spain; from southern England eastwards through Central and Southern Europe (Northern Italy, former Yugoslavia) into Turkey and European territory of Russia; through Siberia to the Pacific coast; Iran (first record).

Diagnostic characters. Frons lustrous, without pruinosity, or with narrow pruinose along margins of eyes; third antennal segment weakly enlarged, black; parafacial with dense gray pruinosity, occasionally with bare lustrous stripe along eyes (fig. 2, *e*); mesoscutum without pruinosity or with narrow strip of pruinosity in anterior part immediately behind head; scutellum with long black bristles along posterior margin (fig. 2, *d*); male genitalia as in (fig. 2, *f*).

Cheilosia* (*Eucartosyrphus*) *rufipes (Preyssler, 1798) (fig. 3, *a–c*)

Material examined. Iran: East Azarbaijan Province, Qaradagh forests, 38°55.601′ N, 46°46.932′ E, 1313 m, 05.07.2011, 4 ♂, 4 ♀; Esparekhan, 37°46.755′ N, 46°24.307′ E, 2473 m, 08.08.2009, 1 ♂, 2 ♂; Kandovan, 37°44.520′ N, 46°19.074′ E, 2900 m, 02.08.2011, 3 ♂, 2 ♀; Oskulu, 38°31.688′ N, 46°55.383′ E, 1996 m, 20.07.2009, 3 ♂, 4 ♀; Horand, 38°51.852′ N, 47°50.104′ E, 1199 m, 01.06.2012, 2 ♂, 4 ♀; Aynali, 38°57.038′ N, 46°44.310′ E, 836 m, 20.06.2010, 3 ♂, 4 ♀; Mekidi, 38°30.570′ N, 46°37.379′ E, 1426 m, 13.07.2009, 3 ♂, 3 ♀; Chichekli, 38°30. 340′ N, 46°37.240′ E, 1689 m, 07.07.2012, 3 ♂, 4 ♀; West Azarbaijan Province, Maragheh, 37°28.330′ N, 46°25.461′ E, 1979 m, 25.06.2010, 3 ♂, 1 ♀ (S. Khaghaninia).

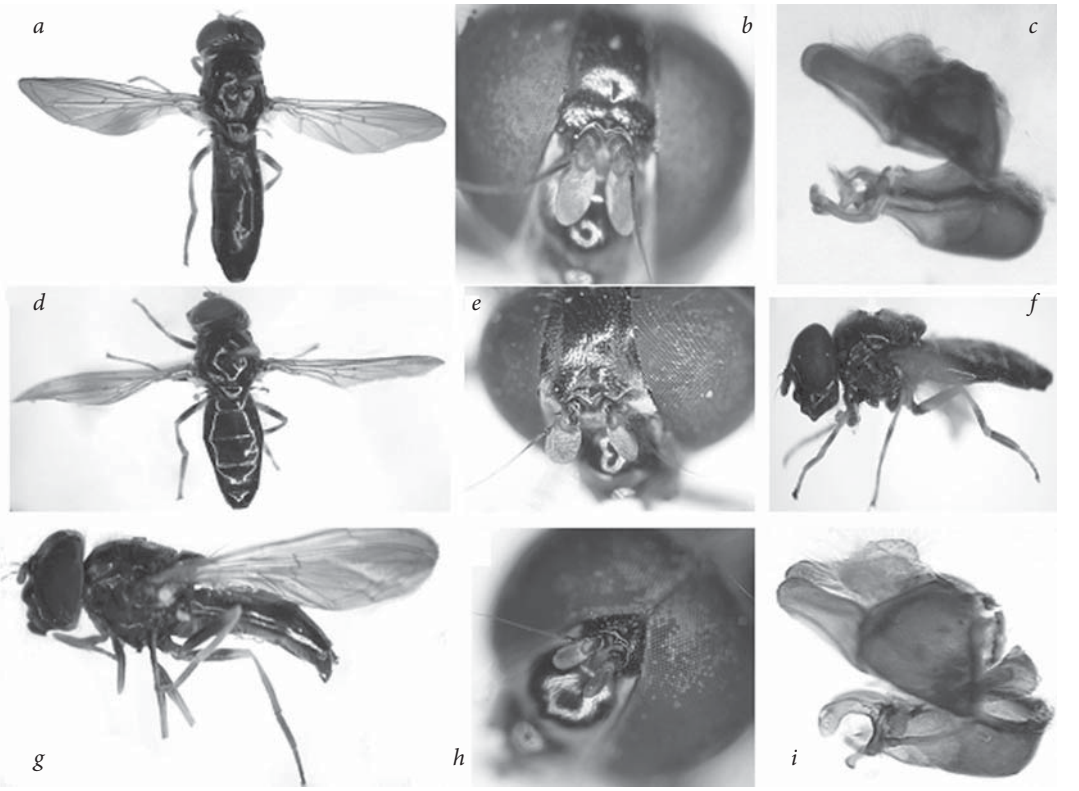

Fig. 3. *Cheilosia rufipes* (*a–c*): *a* — dorsal view of female, *b* — frontal view of head of female, *c* — male genitalia; *C. aruralis*, female (*d–f*): *d* — dorsal view, *e* — frontal view of head, *f* — lateral view; *Cheilosia scutellata* male (*g–i*): *g* — lateral view, *h* — frontal view of head, *i* — genitalia.

Рис. 3. *Cheilosia rufipes* (*a–c*): *a* — самка, вид снизу, *b* — голова самки, фронтальный вид, *c* — гениталии самца; *C. aruralis*, самка (*d–f*): *d* — вид сверху, *e* — голова, фронтальный вид, *f* — латеральный вид; *Cheilosia scutellata,* самец (*g–i*): *g* — латеральный вид, *h* — голова, фронтальный вид, *i* — гениталии.

Distribution. From Fennoscandia southwards to Northern Africa; from Britain (southern England) eastwards through most of Europe into Siberia and on to the Pacific coast, including Japan; Iran (Gilasian, 2005).

Diagnostic characters. Eye bare; facial knob bare and broad from above semicircular running from eye margin to eye margin; 3rd segment of antenna bright red (fig. 3, *b*), anterior anepisternum with hairs along posterodorsal rim; thoracic dorsum with coarse punctuation (fig. 3, *a*); genitalia as (fig. 3, *c*).

Cheilosia* (*Cheilosia*) *ruralis (Meigen, 1822) (fig. 3, *d–f*)

Material examined. Iran: East Azarbaijan Province, Horand, 38°55.985′ N, 47°18.034′ E, 1288 m, 01.07.2010, 2 ♀ (S. Khaghaninia).

Distribution. From Fennoscandia southwards to Iberian Peninsula and the Mediterranean region (including Crete); from Britain eastwards through Central and Southern Europe to the Balkans and Turkey; Northern Africa; Iran (Gilasian, 2005).

Diagnostic characters. Eye with short white hairs in dorsal half; face without distinct hairs (fig. 3, *e*) (microtrichia not taken into account); parafacial without pruinosity, lustrous; mesoscutum with short hairs; femora entirely yellow in female; All tibiae with more or less wide black ring; at least first and second segments of mid tarsus or bases of tibiae yellow (fig. 3, *f*); posterior margin of scutellum with hairs, without strong black or yellow bristles; abdomen with recumbent hairs medially (fig. 3, *d*).

Cheilosia* (*Eucartosyrphus*) *scutellata (Fallén, 1817) (fig. 3, *g–i*)

Material examined. Iran: East Azarbaijan Province, Qaradagh forests, 38°55.601′ N, 46°46.932′ E, 1313 m, 05.07.2011, 1 ♂; Mazandaran Province, Eshkatechal, 36°40.52′ N, 51°12.51′ E, 1200 m, 27.08.2005, 1 ♂; (S. Khaghaninia, E. Gilasian).

Distribution. From Fennoscandia southwards to Iberian Peninsula and round the Mediterranean to Greece, Turkey and N Africa; from Ireland eastwards through Eurasia to the Pacific coast; Iran (Gilasian, 2005).

Diagnostic characters. Eye bare; antennal sockets non-separated, anterior process of lunule not fused with dorsal part of face, third segment of antenna brownish-black (fig. 3, *h*); face without hairs (microtrichia not taken into account); median facial tubercle wide, occupying face from margin to margin in dorsal view; at least mid tibia in basal 1/3 and first segment of mid tarsus yellow dorsally, or 2nd–4th segments of fore and mid tarsi distinctly paler than others (fig. 3, *g*); male genitalia as in (fig. 3, *i*).

Cheilosia* (*Cheilosia*) *transcaucasica Stackelberg, 1960 (fig. 4, *a–c*)

Material examined. Iran: West Azarbaijan Province, Maragheh, 37°57.082′ N, 46°17.058′ E, 1437 m, 09.08.2012, 1 ♂; East Azarbaijan Province, Varzeghan: 38°39.546′ N, 46°16.790′ E, 1059 m, 03.07.2011, 2 ♂, 2 ♀ (S. Khaghaninia).

Distribution. Armenia; Iran (Khaghaninia et al., 2013).

Diagnostic characters. Eye haired; side of facial knob with black hairs (fig. 4, *b*); antennal sockets, antennal brownish-black (fig. 4, *b*); legs entirely black; tergites with white hairs, sternites dusty (fig. 4, *a*); male genitalia as in fig. 4, *c*.

Cheilosia* (*Cheilosia*) *variabilis (Panzer, 1798) (fig. 4, *d–f*)

Material examined. Iran: East Azarbaijan Province, Osculu, 38°53.736′ N, 46°48.860′ E, 1859 m, 20.06.2011, 5 ♀; Aynali, 38°30.570′ N, 46°37.391′ E, 391 m; 15.07.2010, 1 ♂, 3 ♀ (S. Khaghaninia).

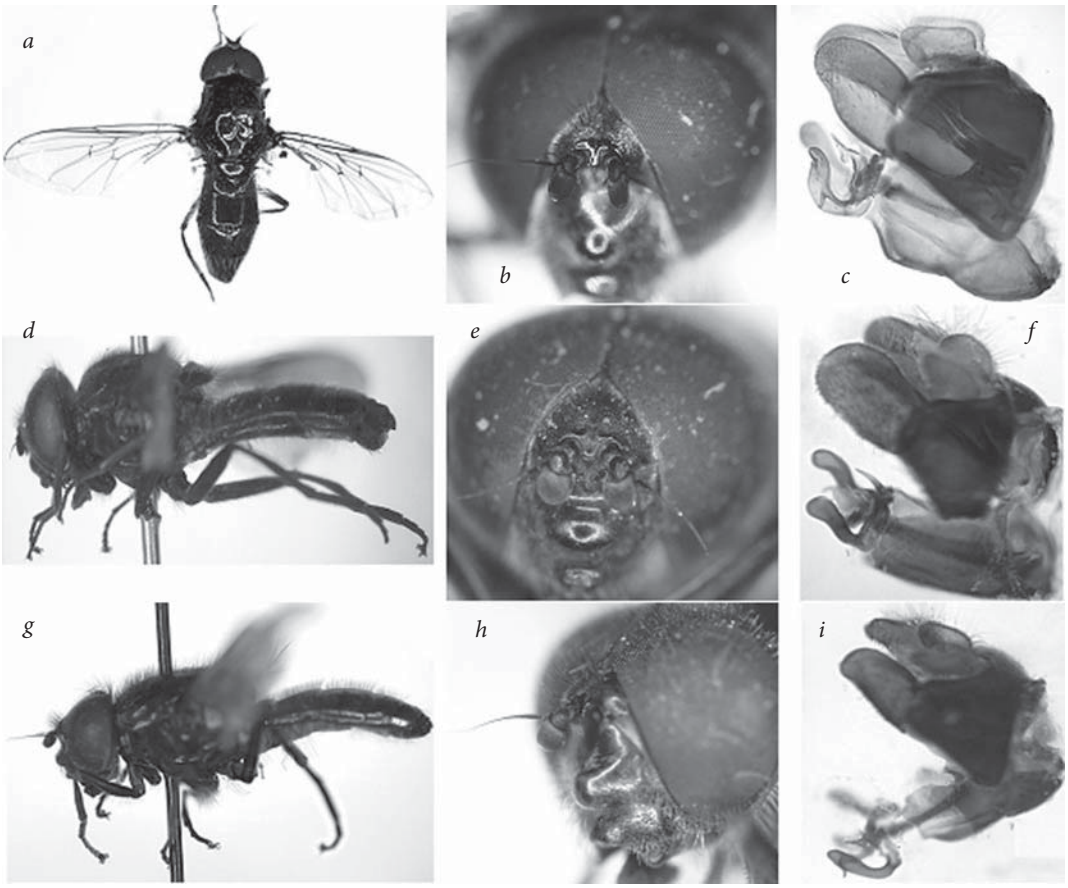

Fig. 4. *Cheilosia transcaucasia,* male (*a–c*): *a* — dorsal view, *b* — frontal view of head, *c* — genitalia; *C. variabili,* male (*d–f*): *d* — lateral view, *e* — frontal view of head, *f* — genitalia; *C. vulpina,* male (*g–i*): *g* — lateral view, *h* — lateral view of head, *i* — genitalia.

Рис. 4. *Cheilosia transcaucasia*, самец (*a–c*): *a* — вид сверху, *b* — голова, фронтальный вид, *c* — гениталии; *C. variabilis,* самец (*d–f*): *d* — латеральный вид, *e* — голова, фронтальный вид, *f* — гениталии; *C. vulpine*, самец (*g–i*): *g* — латеральный вид, *h* — голова, латеральный вид, *i* — гениталии.

Distribution. From southern Fennoscandia southwards to Iberian Peninsula; from Ireland eastwards through Central and Southern Europe (Italy, former Yugoslavia) into Bulgaria, Turkey and Russia as far as western Siberia. Also in N Africa (Morocco); Iran (first record).

Diagnostic characters. Eye haired; antenna black (fig. 4, *e*), arista longer than two times as long as third antennal segment and with hairs longer than diameter of basal thickened part; face with distinct hairs on sides of facial knob; legs black (fig. 4, *d*); scutellar bristle long, at least as long as scutellum; halter pale brown in male; genitalia as in (fig. 4, *f*).

Cheilosia* (*Cheilosia*) *vulpina (Meigen, 1822) (fig. 4, *g–i*)

Material examined. Iran: East Azarbaijan Province, Esparekhan, 37°46.775′ N, 46°24.307′ E, 2473 m, 21.07.2011, 3 ♂ (S. Khaghaninia).

Distribution. Denmark to the Pyrenees and northern Spain; from Britain (England) eastwards through central Europe to central and southern parts of Russia as far as western Siberia; Iran (first record).

Diagnostic characters. Third antennal segment black (fig. 4, *h*); face with distinct hairs occasionally only in lower part; parafacial relatively narrow; scutellum with long black bristles along posterior margin; these hairs longer than scutellum in male and longer than its half in female; legs black (fig. 4, *g*); wing without dark spot medially; male genitalia as in (fig. 4, *i*).

Discussion

Iran located in the Palearctic Region and ecologically has rich vegetation as well rich fauna of various insects including diverse species of hoverflies (Diptera, Syrphidae). The genus *Cheilosia* lean to moderately warm ecological conditions appropriate to distribution deciduous forests and mountain grasslands (Barkalov, 2009), so Iran is situated in the same zone and adequate for development of the *Cheilosia* species.

Based on the results, the species *C. cumanica* has the most frequency among the other species, followed by *C. aerea* and *C. soror*. Khaghaninia (2012) stated that *C. cumanica* has the most species diversity in the Maraghe region so this result confirmed that *C. cumanica* has the most species diversity in the Northwest of Iran.

This survey shows that the fauna of the *Cheilosia* species is so rich in Northwest of Iran. Thus it is expected to find more species of this genus in other geographical parts of Iran.

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