

A contribution to the knowledge of the family Dolichopodidae (Diptera) in East Azerbaijan province of Iran

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ABSTRACT: Based on specimens collected from East Azerbaijan province during 2009-2011, four genera and eleven species of the family Dolichopodidae are recognized. Seven species (*Diaphorus sublautus* Negrobov, *Dolichopus austriacus* Parent, *D. campestris* Meigen, *D. immaculatus* Becher, *D. subpennatus* Fonseca, *D. ungulatus* (Linnaeus), *Hercostomus phoebus* Parent are recorded from Iran for the first time. Photos and an adapted key to species of the family Dolichopodidae occurring in this region are given.

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The Dolichopodidae is a very large family of the order Diptera with more than 7500 described species and 276 genera, including nearly 100 fossil species and 29 fossil genera (Grichanov et al., 2011). The family Dolichopodidae belongs to the superfamily Empidoidea (Chvála, 1983; Collins and Wiegmann, 2002). The external morphology of the most Dolichopodidae is rather remarkable that allows easily distinguishing them in a sweeping net even from the closest Empidoidea and other flies by metallic body and mosquito-like habitus with long legs. The head is more or less hemispherical, antennae are generally inserted at the upper third of head. Arista two-segmented. Thorax has more or less parallelepiped (subrectangular) shape, convex laterally. Vein R_5 originating at or near level of crossvein h, distal to crossvein h by, at most, length of crossvein h. Crossvein r-m in basal fourth of wing; cells bm and dm confluent, that is, crossvein bm-cu absent (McAlpine et al., 1981; Grichanov, 2007). Biologically, adults and larvae of most species are predators; species of only one genus (*Thrypticus* Loew, 1869) are known to be phytophages living inside stems of cereal grasses. Most of the numerous species of the cosmopolitan genus *Medetera* Fischer von Waldheim, 1819 are associated with tree trunks, especially in boreal forests, where their larvae are predacious mainly on bark-beetles (Coleoptera) (Grichanov, 2007). The first contribution to the fauna of Dolichopodidae of Iran was made by Th. Becker and P. Stein (1913). Later new records of Iranian Dolichopodidae were published by O.P. Negrobov and L. Matile (1974). Grichanov et al. (2010) compiled a list of Dolichopodidae of the country including 38 species belonging to 17 genera. Nevertheless, the real number may reach more than 250 species following special expeditions covering a wider geographical area of the country. For comparison, so far more than 220 species are known for the Russian

Northwestern Caucasus (Grichanov, 2012). Therefore, a discussion on the zoogeography of Iranian dolichopodid fauna is premature.

Materials collected by sweeping net on side of swamplands, springs and on flower heads of some plants of families Asteraceae, Lamiaceae and Ranunculaceae in six localities of Qurigol Lake during 2009-2011. The Qurigol is a small lake, about 200 hectares in area, fresh to brackish, with associated marshes in the steppe uplands of northwestern Iran. There are extensive areas of reed beds. It is situated in about 40 km east to southeast of Tabriz city UTM (Universal Transfer Mercator) coordinate system, X from 648018.93 to 649957.19 E; Y from 4196810.31 to 4198645.34, with latitudes 1833 m to 1950 m a.s.l. The surrounding area is semi-arid, and there is wheat cultivation in the west and damp grasslands in the southwest. This area has rich grass lands with various species of Asteraceae, Cyperaceae, Lamiaceae, Plantaginaceae, Poaceae and Ranunculaceae. The flies were killed in a killing jar containing potassium cyanide. Collected specimens were deposited at the Insect Museum of Tabriz University (IMTU).

In this study, eleven species of four genera (*Diaphorus sublautus* Negrobov, 2007, *Dolichopus austriacus* Parent, 1927, *D. campestris* Meigen, 1824, *D. griseipennis* Stannius, 1831, *D. immaculatus* Becker, 1909, *D. nubilus* Meigen, 1824, *D. subpennatus* Fonseca, 1976, *D. ungulatus* (Linnaeus, 1758), *Hercostomus phoebus* Parent, 1927, *Syntormon pallipes* (Fabricius, 1794)) were collected in East Azerbaijan province. Of them, seven species (*Diaphorus sublautus*, *Dolichopus austriacus*, *D. campestris*, *D. immaculatus*, *D. subpennatus*, *D. ungulatus*, *Hercostomus phoebus*) are newly reported for the Iranian insect fauna. In addition, all species are recorded for the first time from the province. Species are listed in alphabetic order.

Key to the species of the family Dolichopodidae in East Azerbaijan (males)

Adapted from Grichanov, 2007.

1. Antennal pedicel seen on inside face, forming a long thumb-like projection into postpedicel; hind basitarsus with two bare ventral hooks in basal half.
..... *Syntormon pallipes* (Fabricius)
- Antennal pedicel simple, vasselike, without thumb-like projection. 2
2. Scape bare above, face broad, male frons narrow.
..... *Diaphorus sublautus* Negrobov
- Scape with hairs above. 3
3. Hind basitarsus without bristles above.
..... *Hercostomus phoebus* Parent
- Hind basitarsus with distinct bristles above. 4
4. Cercus black. *Dolichopus campestris* Meigen
- Cercus yellow. 5
5. Hind femora black or dark brown. 6
- Hind femora yellow. 7
6. Lower calypter with black cilia.
..... *Dolichopus immaculatus* Becker
- Lower calypter with pale cilia. *Dolichopus clavipes* Haliday
7. Lower postocular setae black.
..... *Dolichopus unguatus* (Linnaeus)
- Lower postocular setae pale. 8
8. M_{1+2} with rudiment of M_2
..... *Dolichopus griseipennis* Stannius
- M_{1+2} without rudiment of M_2 9
9. Mid tarsus with 4th and 5th segments silvery white on anterior side, with 2nd and 3rd segments laterally compressed. *Dolichopus subpennatus* Fonseca
- Mid tarsus simple. 10
10. Fore tibia with long apicoventral seta.
..... *Dolichopus austriacus* Parent
- Fore tibia without apicoventral seta.
..... *Dolichopus nubilus* Meigen

***Diaphorus sublautus* Negrobov, 2007**

(Figures 1a and 4a)

Material examined: 1 ♂, Qurigol, 37°54' N 46°41' E, 1950 m a.s.l., 9 Jul. 2011.**Distribution:** Azerbaijan (Negrobov et al., 2007). New to Iran.***Dolichopus austriacus* Parent, 1927**

(Figures 1b and 4b)

Material examined: 1 ♂, Qurigol, 37°55' N 46°41' E, 1915 m a.s.l., 4 Aug. 2009.**Distribution:** Austria, Estonia, Finland, Germany, Romania, Russia (Astrakhan), Sweden, Turkey and Uzbekistan (Grichanov, 2007; Naglis, 2011; Tonguç and Barlas, 2011). New to Iran.***Dolichopus campestris* Meigen, 1824** (Figures 1c and 4c)**Material examined:** 2 ♂, Qurigol, 37°55.028' N 46°41.244' E, 1847 m a.s.l., 2 Sep. 2010.**Distribution:** Algeria, Armenia, Austria, Belarus, Belgium, Czech, Denmark, Egypt; Estonia, Finland, France, Georgia, Germany, Hungary, Ireland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Netherlands, Norway, Poland, Romania, Russia (Karelia, Leningrad, Novgorod, Alania, Kabardino-Balkaria, Krasnodar, Altai, Kamchatka, Khabarovsk and Primorskii Terr.), Slovakia, Sweden, Switzerland, Turkey, UK, Ukraine (Carpathian Mountains, Odessa) (Grichanov, 2007; Naglis, 2011). New to Iran.***Dolichopus clavipes* Haliday, 1831** (Figures 1d and 4d)**Material examined:** 2 ♂, Qurigol, 37°54.975' N 46°41.120' E, 1943 m a.s.l., 9 Jul. 2010.**Distribution:** Iran, S Russia (Krasnodar), Ukraine (Kherson, Odessa, Zaporizhzhya), W and N Europe; E Russia (Buryatia, Irkutsk Region, Krasnoyarsk Terr., Yakutia), China, Kazakhstan, Mongolia, Tajikistan, Uzbekistan (Grichanov et al., 2010).***Dolichopus griseipennis* Stannius, 1831** (Figures 2a and 4e)**Material examined:** 1 ♂, Qurigol, 37°55.028' N 46°41.244' E, 1847 m a.s.l., 2 Sep. 2010.**Distribution:** Algeria, ?Armenia, Azerbaijan, Austria, Belgium, Bulgaria, Bosnia and Herzegovina, Croatia, Cyprus, Czech, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece incl. Crete, Hungary, Iran, Ireland, Israel, Italy, N Kazakhstan, Lithuania, Luxembourg, ?Macedonia, Morocco, Netherlands, Norway, Poland, Romania, Russia (Adygea, Krasnodar, Moscow), Slovakia, ?Slovenia, Spain incl. Balearic Is., Sweden, Switzerland, Tunisia, Turkey, "Former Yugoslavia"; Middle Asia (Grichanov, 2012).***Dolichopus immaculatus* Becher, 1909** (Figures 2b and 4f)**Material examined:** 4 ♂, Qurigol, 37°55.215' N 46°41.519' E, 1888 m a.s.l., 8 Aug. 2009.**Distribution:** Austria, Czech Republic, France, Israel, Poland and Turkey (Parvu and Popescu-Mirceni, 2006; Grichanov, 2007). New to Iran.***Dolichopus nubilus* Meigen, 1824** (Figures 2c and 4g)**Material examined:** 1 ♂, Qurigol, 37°55.215' N 46°41.519' E, 1888 m a.s.l., 2 Aug. 2011.**Distribution:** Armenia, Austria, Azerbaijan, Belgium, Bulgaria, China (Xinjiang), Czech, Denmark, Estonia, Finland, France, Germany, Greece incl. Crete; Hungary, Iran, Ireland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Netherlands, Norway, Poland, Romania, Russia (Karelia, Leningrad, Adygea, Krasnodar, Rostov), Slovakia, Spain, Sweden, Switzerland, Tajikistan, Turkey, Ukraine (Kherson, Odessa), UK, Uzbekistan (Tonguç et al., 2009; Grichanov, 2012).***Dolichopus subpennatus* Fonseca, 1976**

(Figures 2d and 4h)

Material examined: 2 ♂, Qurigol, 37°54' N 46°42' E, 1921 m a.s.l., 6 Jun. 2011.

Distribution: Czech Republic, Denmark, Estonia, Finland, Germany, Ireland, Netherlands, Norway, Romania, Russia (Adygea), Slovakia, Sweden, Turkey and UK (Grichanov, 2007; Grichanov and Tonguç, 2010). New to Iran.

***Dolichopus ungulatus* (Linnaeus, 1758)** (Figures 3a and 4i)

Material examined: 1 ♂, Qurigol, 37°55.028' N 46°41.244' E, 1847 m a.s.l., 2 Sep. 2010.

Distribution: Bulgaria, Georgia, Romania, S Russia (Adygea, Alania, Kabardino-Balkaria, Karachai-Cherkessia, Krasnodar) and Ukraine (Odessa, Carpathia); Palearctic and Nearctic Regions (Grichanov, 2007). New to Iran.

***Hercostomus phoebus* Parent, 1927** (Figures 3b and 4m)

Material examined: 1 ♂ and 3 ♀, Qurigol, 37°54.975' N 46°41.120' E, 1943 m a.s.l., 9 Jul. 2010. 1 ♂ and 3 ♀, 37°55.028 N 46°41',244 E, 1847 m a.s.l., 2 Sep. 2010.

Distribution: Armenia and Turkey (Grichanov, 2007). New to Iran.

***Syntormon pallipes* (Fabricius, 1794)** (Figures 3c, 3d, 3e and 4n)

Material examined: 2 ♂ and 3 ♀, Qurigol, 37°55' N 46°41' E, 1915 m a.s.l., 4 Aug. 2009. 2 ♀, 37°54 N 46°42' E, 1921 m a.s.l., 1 Jun. 2011.

Distribution: Abkhazia, Afghanistan, Algeria, Armenia, Austria, Azerbaijan, Belgium, Bulgaria, China, Czech,

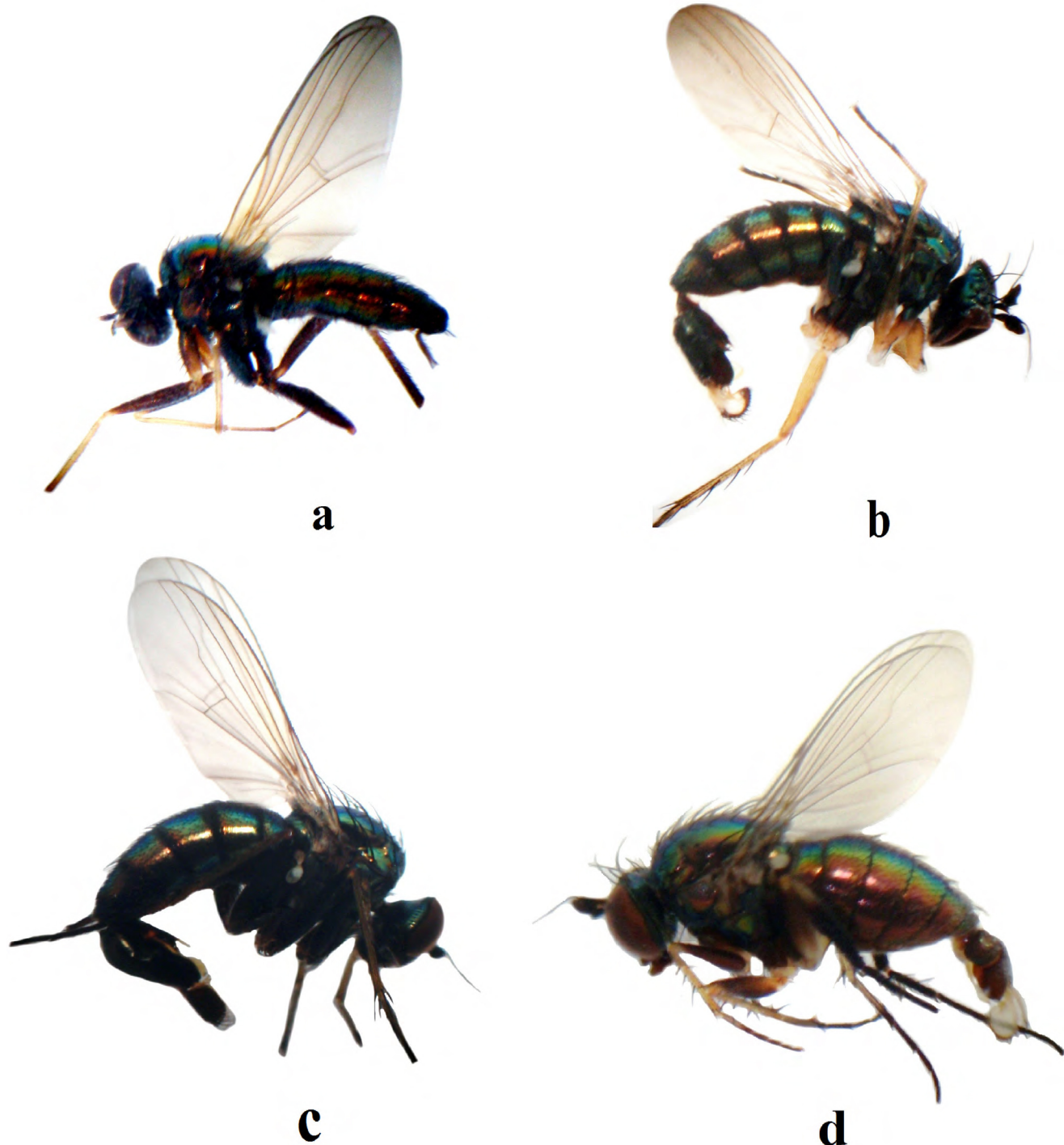


FIGURE 1. a) *Diaphorus sublautus*, male, habitus; b) *Dolichopus austriacus*, male, habitus; c) *Dolichopus campestris*, male, habitus; d) *Dolichopus clavipes*, male, habitus.

Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece incl. Crete, Hungary, Iceland, Iran, Iraq, Ireland, Israel, Italy, Jordan, Kyrgyzstan, Latvia, Morocco, Netherlands, Norway, Poland, Portugal incl. Madeira, Azores, Romania, Russia (Adygea, Alania, Kabardino-Balkaria, Karachai-Cherkessia, Krasnodar, Leningrad,

Murmansk, Rostov, Voronezh), Slovakia, ?Slovenia, Spain, Sweden, Switzerland, Tajikistan, Tunisia, Turkey, Ukraine (Crimea, Kherson, Odessa), United Kingdom, Uzbekistan, «Former Yugoslavia»; Oriental: China; Afrotropical: Madagascar, Tanzania, Yemen, St Helena (?introduced). (Grichanov, 2007).

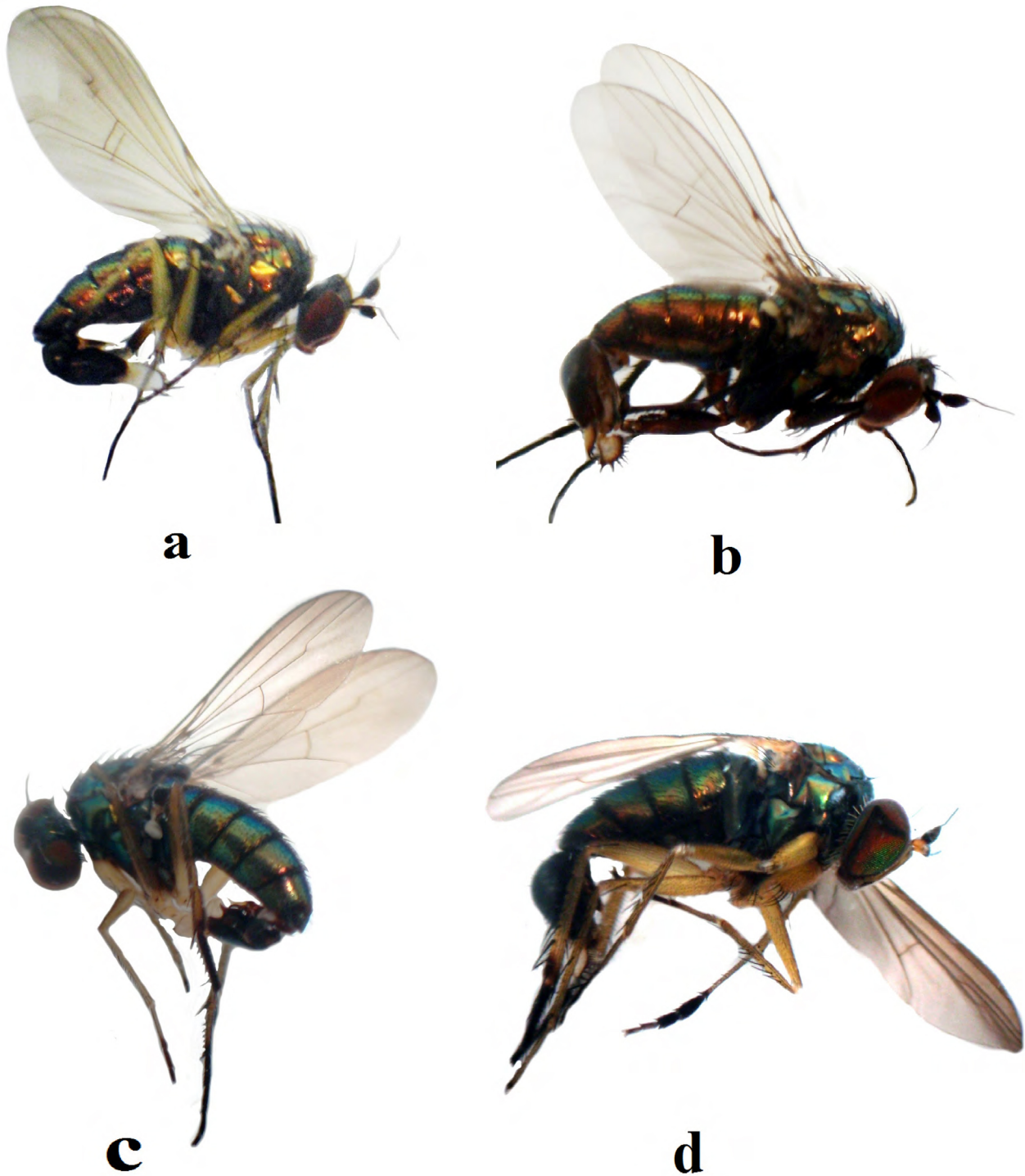


FIGURE 2. a) *Dolichopus griseipennis*, male, habitus; b) *Dolichopus immaculatus*, male, habitus; c) *Dolichopus nubilus*, male, habitus; d) *Dolichopus subpennatus*, male, habitus.

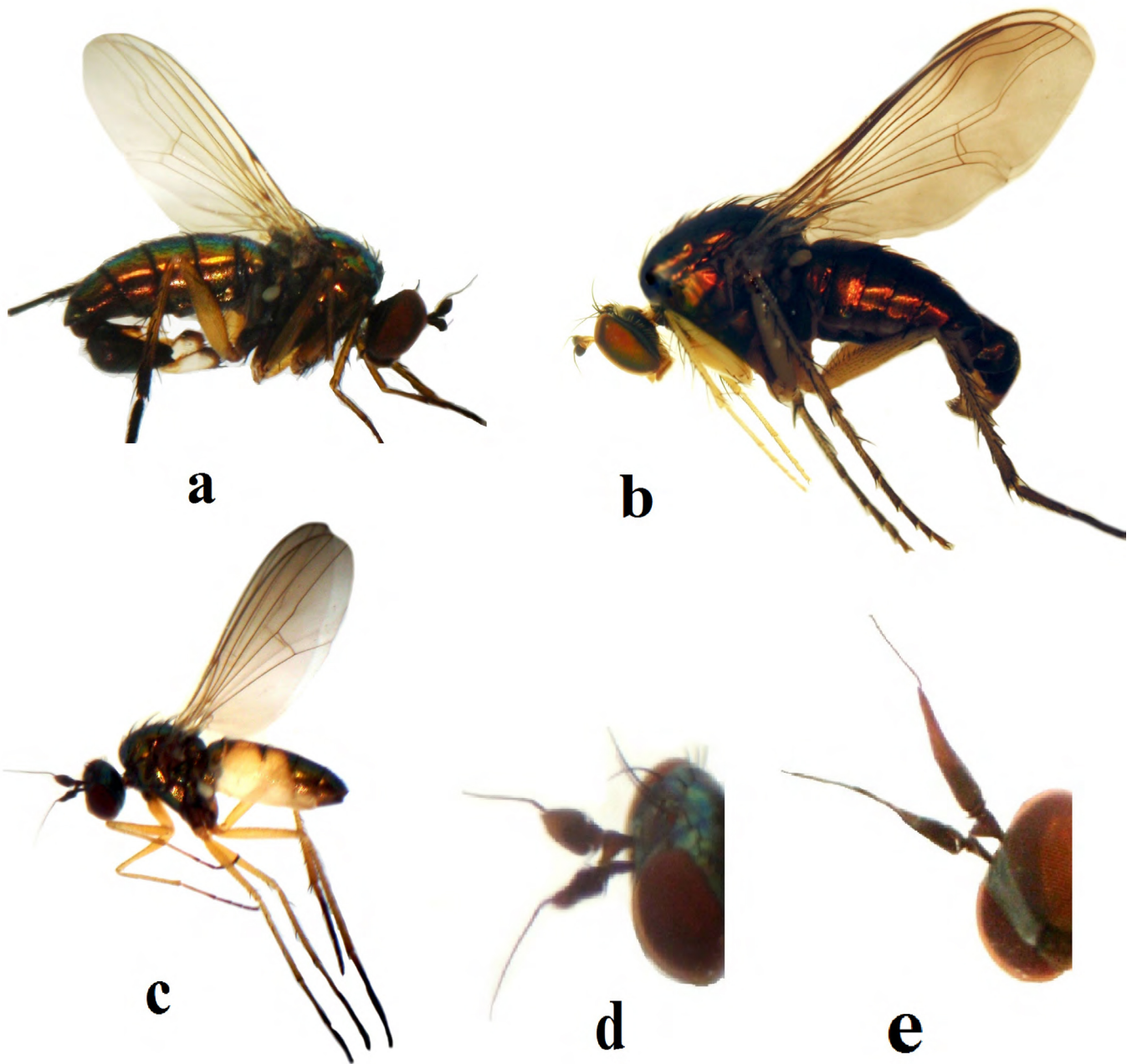


FIGURE 3. a) *Dolichopus unguulatus*, male, habitus; b) *Hercostomus phoebus*, male, habitus; c) *Syntormon pallipes*, female, habitus; d) *Syntormon pallipes*, female, antenna, e) *Syntormon pallipes*, male, antenna.

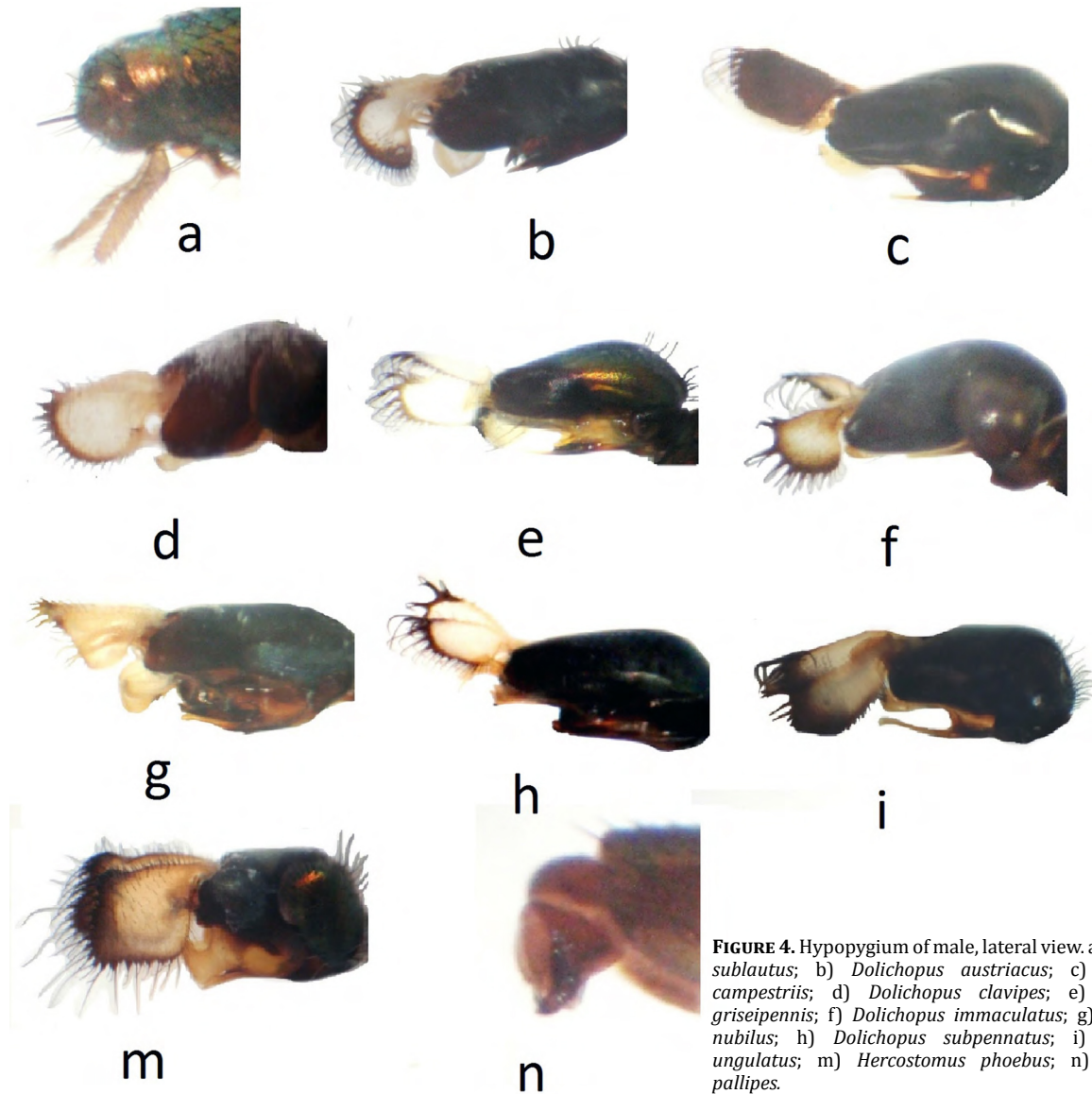


FIGURE 4. Hypopygium of male, lateral view. a) *Diaphorus sublautus*; b) *Dolichopus austriacus*; c) *Dolichopus campestris*; d) *Dolichopus clavipes*; e) *Dolichopus griseipennis*; f) *Dolichopus immaculatus*; g) *Dolichopus nubilus*; h) *Dolichopus subpennatus*; i) *Dolichopus unguatus*; m) *Hercostomus phoebus*; n) *Syntormon pallipes*.

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