

Research Article

## Dung flies fauna (Diptera: Scathophagidae) in East Azerbaijan province of Iran, with eight new records

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**Abstract:** Based on specimens collected from East Azerbaijan province during 2009-2012, five genera and nine species of the family Scathophagidae are recognized. Eight species including: *Cordilura rufipes* (Meigen, 1826), *Gimnomera montana* Ozerov et Krivosheina, 2013, *Norellisoma spinimana* (Fallén, 1819), *Parallelomma albipes* (Fallén, 1819), *Scathophaga kaszabi* (Šifner, 1975), *Scathophaga lutaria* (Fabricius, 1794), *Scathophaga stercoraria* (Linnaeus, 1758), *Scathophaga taeniopa* (Rondani, 1867) and four genera (*Cordilura* Fallén, 1810, *Gimnomera* Rondani, 1866, *Norellisoma* Wahlgren, 1917, *Parallelomma* Becker, 1894)) are recorded from Iran for the first time. Photos and key to species of the family Scathophagidae occurring in this region are provided.

**Keywords:** Dung flies, Scathophagidae, new records, East Azerbaijan province, Iran

### Introduction

The Scathophagidae (dung flies) is a small family of the superfamily Muscoidea (Diptera; Calypterata) with about 419 species which belong to two subfamilies (Scathophaginae and Deliniinae) (Ozerov, 2009; Pape et al., 2011; Šifner, 2012). The family Scathophagidae includes more than 57 genera and 250 species, mainly in the Palaearctic region (Šifner, 2008, 2009; Ozerov and Freidberg, 2010). The most species of Scathophagidae are distinguished from the closest Muscoid flies by combinations of the following characters: Male and female eyes dichoptic, palpi present, occiput usually with numerous fine pale setulae, frontal vitta broad and without

setae, lower calipter linear, meron without hairs and setae, ventral surface of scutellum bare, katepisternum usually with one bristle,  $A_1$  usually reaching wing margin,  $A_2$  not curved forward beyond tip of  $A_1$  (McAlpine, 1981; Ozerov, 2009). Biologically, adults are predators, most larvae are phytophagous, some larvae are scavenger or carnivorous (Gorodkov, 1986; Ozerov and Freidberg, 2010). The first contribution to the fauna of Scathophagidae of Iran was made by F. Šifner (1981) who described 2 species belonging to 2 genera (*Paramicroprosopa hoberlandti* (Šifner, 1981) and *Scathophaga jezeki* (Šifner, 1981)). Nevertheless, the long-legged flies of Iran are poorly known. Present study adds four genera and eight species of dung flies to the fauna of Iran.

### Materials and Methods

Adult specimens were collected by standard sweep-netting in forest and grassland habitats

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from East Azerbaijan province of Iran during 2009-2012. The samples were killed in a killing jar containing potassium cyanide. Male genitalia were macerated in 10% KOH. The material examined is deposited in collections of the following institutions:

IMTU: Insect Museum of Tabriz University.

ZMUM: Zoological Museum, Moscow University.

## Results

In this study, five genera and nine species of the family Scathophagidae are recognized. Eight species including *Cordilura rufipes* (Meigen, 1826), *Gimnomera montana* Ozerov et Krivosheina, 2013, *Norellisoma spinimana* (Fallén, 1819), *Parallelomma albipes* (Fallén, 1819), *Scathophaga kaszabi* (Šifner, 1975), *Scathophaga lutaria* (Fabricius, 1794), *Scathophaga stercoraria* (Linnaeus, 1758), *Scathophaga taeniopa* (Rondani, 1867) are recorded from Iran for the first time. Of which, four genera (*Cordilura* Fallén, 1810, *Gimnomera* Rondani, 1866, *Norellisoma* Wahlgren, 1917, *Parallelomma* Becker, 1894) are new records to Iran. 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 Scathophagidae in East Azerbaijan

1. Abdomen with long and dense yellow hairs. 2
  - Abdomen without dense hairs.....4
2. Pteropleoron with hairs .....
  - .....*Scathophaga stercoraria* (Linnaeus)
  - Pteropleoron bare .....3
3. Body yellowish, hind femur with more than 3 long dorsal setae..... *S. lutaria* (Fabricius)
  - Body greenish, hind femur of male with 2 to 3 long dorsal setae..... *S. taeniopa* (Rondani)
4. Body yellow .....5
  - Body dark green or black .....6
5. One pair of scutellar setae .....
  - .....*Norellisoma spinimana* (Fallén)
  - Two pairs of scutellar setae.....*Gimnomera montana* Ozerov et Krivosheina
6. Body greenish .....7

- Body black .....8
- 7. Occiput with some black setae, 4<sup>th</sup> abdominal sternite long, surstylus wide (Fig. 10, 12) .....*S. jezeki* (Šifner)
- Occiput with yellow setae, 4<sup>th</sup> abdominal sternite broad, surstylus thin (Fig. 11, 13).....*S. kaszabi* (Šifner)
- 8. Femora black .....
  - .....*Cordilura rufipes* (Meigen)
  - Femora yellow.....
    - .....*Parallelomma albipes* (Fallén)

### *Cordilura rufipes* (Meigen, 1826) (Fig. 1)

**Material examined:** East Azerbaijan: Kandovan, 37°46' N, 46°16' E, 2500 m a.s.l., 15 June 2010 (moist grassland habitat), 1 ♀; Maragheh, 37°25' N, 46°25' E, 1790 m a.s.l., 5 June 2011 (dry grassland habitat), 1 ♀; (2 ♀, IMTU; 1 ♀ ZMUM).

**Distribution:** Austria, Belgium, China, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Lithuania, Mongolia, Netherlands, Norway, Poland, Romania, Russia, Siberia, Slovakia, Spain, Sweden (Šifner, 2008). New to the Iranian insect fauna.

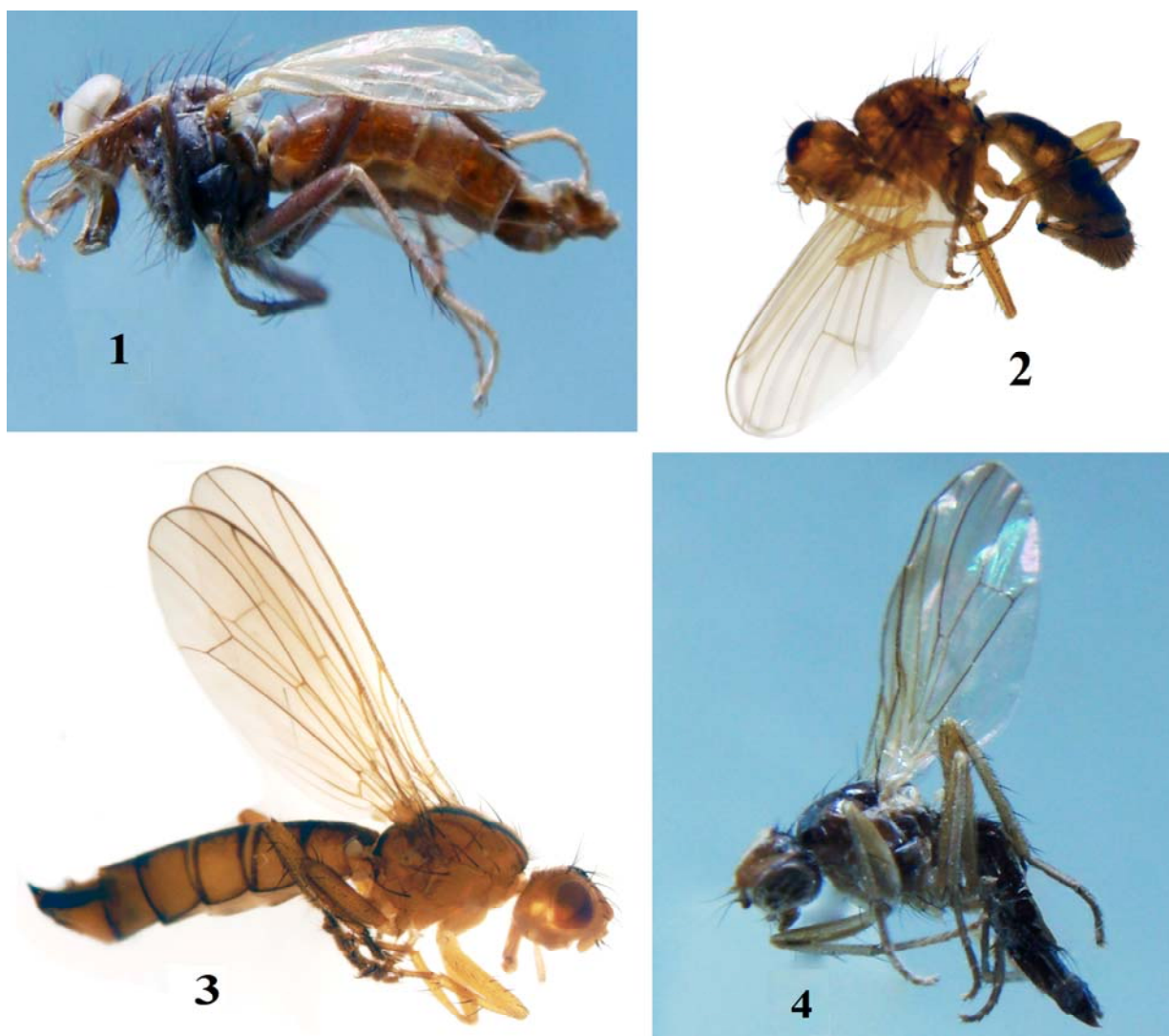
### *Gimnomera montana* Ozerov et Krivosheina, 2013 (Fig. 2)

**Material examined:** East Azerbaijan: Ajabshir, 37°31' N, 46°07' E, 1660 m a.s.l., 10 July 2009; (dry grassland habitat), 1 ♂; Chichakli, 38°39' N, 46°31' E, 2140 m a.s.l., 5 August 2010 (forest-grassland habitat), 2 ♂; (3 ♂, IMTU; 1 ♂ ZMUM).

**Distribution:** Armenia, Georgia and Russia (Ozerov and Krivosheina, 2013). New to the Iranian insect fauna.

### *Norellisoma spinimana* (Fallén, 1819) (Fig. 3)

**Material examined:** East Azerbaijan: Chichakli, 38°39' N, 46°31' E, 2140 m a.s.l., 20 June 2009 (forest-grassland habitat), 2 ♀; Kandovan, 37°45' N, 46°18' E, 2844 m, 10 July 2010, 1 ♀; 37°44' N, 46°19' E, 3005 m, 22 May 2012 (moist grassland habitat), 1 ♀; (4 ♀, IMTU; 1 ♀ ZMUM).



**Figure 1-4** Habitus, lateral view. **1.** *Cordilura rufipes* (Meigen, 1826) (dry specimen), **2.** *Gimnomera montana* Ozerov et Krivosheina, 2013 (alcoholic specimen), **3.** *Norellisoma spinimana* (Fallén, 1819) (alcoholic specimen), **4.** *Parallelomma albipes* (Fallén, 1819) (dry specimen).

**Distribution:** Andorra, Austria, Belgium, Bosnia-Herzegovina, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Macedonia, Netherlands, Norway, Poland, Romania, Russia, Siberia, Slovakia, Spain, Sweden, Nearctic region (Šifner, 2008). New to the Iranian insect fauna.

***Parallelomma albipes* (Fallén, 1819) (Fig. 4)**

**Material examined:** East Azerbaijan: Gharadagh, 38°51' N, 46°52' E, 1770 m a.s.l., 15 June 2009 (forests habitat), 2 ♀; (1 ♀, IMTU; 1 ♀ ZMUM).

**Distribution:** Andorra, Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Lithuania, Mongolia, Netherlands, Norway, Poland, Romania, Russia, Siberia, Slovakia, Spain, Sweden,

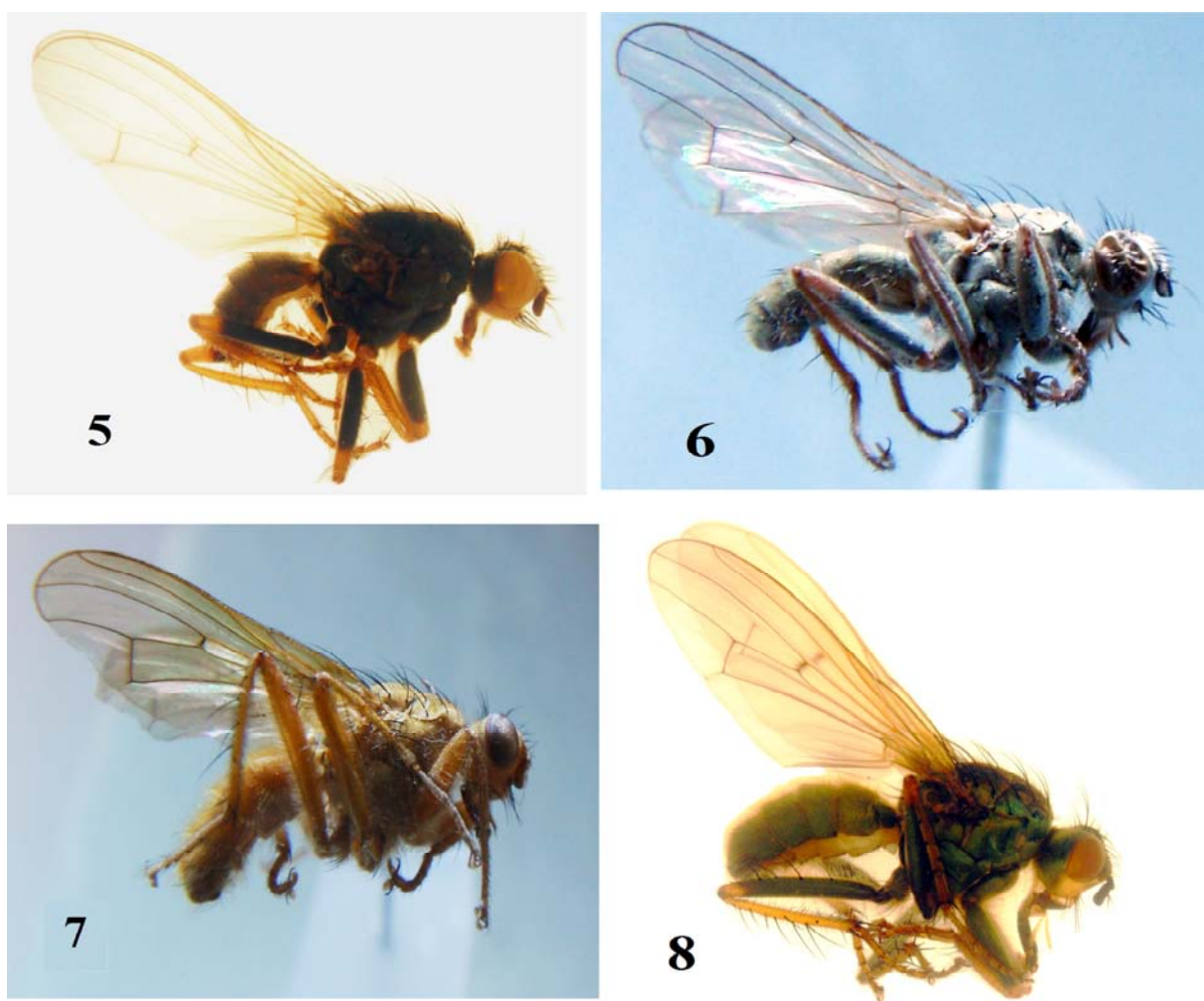
Switzerland (Šifner, 2008). New to the Iranian insect fauna.

***Scathophaga jezeki* (Šifner, 1981) (Fig. 5, 10, 12)**

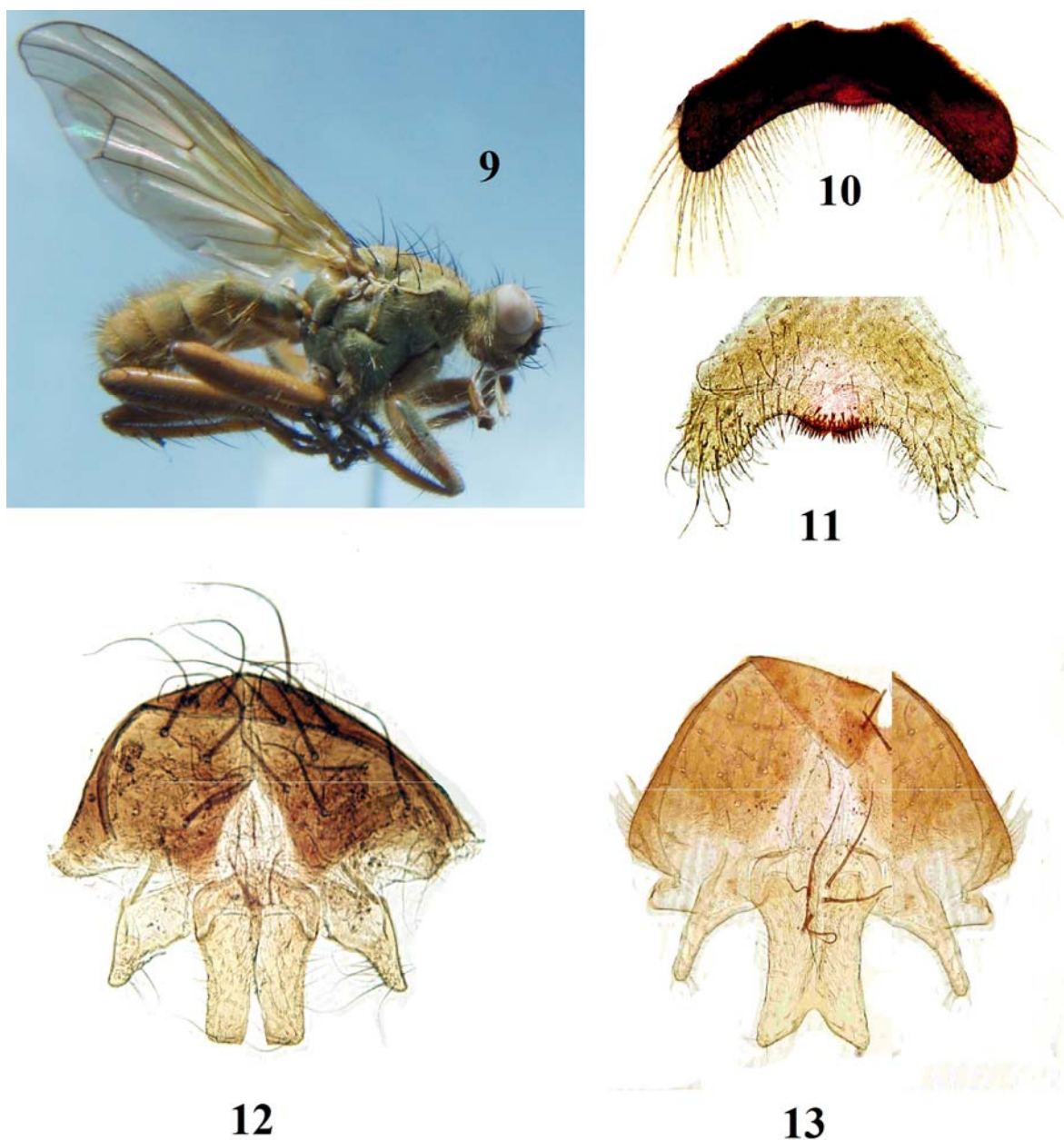
**Material examined:** East Azerbaijan: Maraghe, 37°25' N, 46°25' E, 1787 m a.s.l., 25 June 2009 (dry grassland habitat), 1 ♂, 1 ♀; Chichakli, 38°35' N, 46°14' E, 1219 m

a.s.l., 29 July 2010 (forest- grassland habitat), 2 ♂; Qurigol, 37°54.975' N, 46°41'120' E, 1943 m a.s.l., 9 Jul. 2010 (dry grassland habitat), 1 ♂, 1 ♀; Kandovan, 37°44' N, 46°19' E, 3005 m a.s.l., 6 June 2011 (moist grassland habitat), 1 ♂, 2 ♀; (2 ♂, 3 ♀, IMTU; 2 ♂ ZMUM).

**Distribution:** Iran, United Arab Emirates (Šifner, 2009).



**Figure 5-8** Habitus, lateral view. **1.** *Scathophaga jezeki* (Šifner, 1981) (alcoholic specimen), **2.** *Scathophaga kaszabi* (Šifner, 1975) (dry specimen), **3.** *Scathophaga lutaria* (Fabricius, 1794) (dry specimen), **4.** *Scathophaga stercoraria* (Linnaeus, 1758) (Fallén, 1819) (alcoholic specimen).



**Figure 9-13** 9. *Scathophaga taeniopa* (Rondani, 1867) (Habitus, lateral view, dry specimen). 10. *Scathophaga jezeki* (Šifner, 1981) (4<sup>th</sup> abdominal sternite), 11. *Scathophaga kaszabi* (Šifner, 1975) (4<sup>th</sup> abdominal sternite), 12. *Scathophaga jezeki* (Šifner, 1981) (epandrium, dorsal view), 13. *Scathophaga kaszabi* (Šifner, 1975) (epandrium, dorsal view).

***Scathophaga kaszabi* (Šifner, 1975) (Fig. 6, 11, 13)**

**Material examined:** East Azerbaijan: Gharadagh, 38°51' N, 46°52' E, 1770 m a.s.l., 15 June 2009 (forests habitat), 1 ♂, 3 ♀;

Chichakli, 38°35' N, 46°14' E, 1219 m a.s.l., 29 July 2010 (forest- grassland habitat), 2 ♂, 1 ♀; Qurigol, 37°54.975' N, 46°41', 120 E, 1943 m a.s.l., 9 Jul. 2010 (dry grassland habitat), 1 ♀; Kandovan, 37°44' N, 46°19' E, 3005 m a.s.l., 6

June 2011 (moist grassland habitat), 2 ♂, 3 ♀; (4 ♂, 8 ♀, IMTU; 1 ♂ ZMUM).

**Distribution:** Mongolia (Šifner, 2008). New to the Iranian insect fauna.

***Scathophaga lutaria* (Fabricius, 1794) (Fig. 7)**

**Material examined:** East Azerbaijan: Gharadagh, 38°53' N, 46°48' E, 1859 m a.s.l., 20 June 2010 (forests habitat), 1 ♂, 1 ♀; Qurigol, 37°54.975 N, 46°41', 120 E, 1943 m a.s.l., 9 July 2012 (dry grassland habitat), 2 ♂; (2 ♂, IMTU; 1 ♂, 1 ♀, ZMUM).

**Distribution:** Algeria, Austria, Bosnia-Herzegovina, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Israel, Italy, Lebanon, Netherlands, Norway, Poland, Russia, Siberia, Slovakia, Slovenia, Spain, Switzerland, Tunisia, Turkey (Šifner, 2008). New to the Iranian insect fauna.

***Scathophaga stercoraria* (Linnaeus, 1758) (Fig. 8)**

**Material examined:** East Azerbaijan: Ajabshir, 37°30' N, 46°01' E, 1437 m, 20 June 2009, 2 ♂, 2 ♀, 37°29' N, 45°52' E, 2037 m 15 July 2010, (dry grassland habitat), 3 ♂, 2 ♀; Maraghe, 37°25' N, 46°25' E, 1787 m a.s.l., 25 June 2009 (dry grassland habitat), 2 ♂; Chichakli, 38°39' N, 46°31' E, 2140 m a.s.l., 5 August 2009, 5 ♂, 8 ♀, 38°39' N, 46°31' E, 2140 m, 28 July 2010, (forest-grassland habitat), 3 ♀; Qaradagh, 38°51' N, 46°52' E, 1770 m a.s.l., 14 June 2010, (forest habitat), 10 ♂, 14 ♀; Horand, 38°59' N, 47°22' E, 1370 m, 15 July 2010, 5 ♂, 3 ♀, 38°56' N, 47°27' E, 1360 m, 5 July 2010 (dry to moist grassland habitat), 2 ♂; Kandovan, 37°44' N, 46°19' E, 3005 m a.s.l., 6 June 2011 (moist grassland habitat), 4 ♂, 7 ♀; Qurigol, 37°54.975 N, 46°41', 120 E, 1943 m a.s.l., 9 July 2012 (dry grassland habitat), 5 ♂, 6 ♀; Isperekhan, 37°46' N, 46°24' E, 2504 m, 10 August 2012, (dry grassland habitat), 2 ♂, 2 ♀; (38 ♂, 44 ♀, IMTU; 2 ♂, 3 ♀, ZMUM).

**Distribution:** Afghanistan, Andorra, Austria, Bosnia-Herzegovina, China, Czech

Republic, Denmark, Egypt, Estonia, France, Finland, Germany, Great Britain, Hungary, Iceland, Ireland, Italy, Japan, Lithuania, Mongolia, Norway, Netherlands, Poland, Portugal, Romania, Russia, Siberia, Far East, Slovakia, Spain, Sweden, Switzerland, Tunisia, Nearctic region, Oriental region (Šifner, 2008; Ozerov, 2010). New to the Iranian insect fauna.

***Scathophaga taeniopa* (Rondani, 1867) (Fig. 9)**

**Material examined:** East Azerbaijan: Isperekhan, 37°46' N, 46°24' E, 2504 m a.s.l., 8 Aug. 2010, 4 ♂; Chichakli, 38°38' N, 46°14' E, 1429 m a.s.l., 29 Jul. 2009, 1 ♂.

**Distribution:** Austria, Czech Republic, France, Germany, Italy, Poland, Russia, Slovakia, Switzerland (Šifner, 2008). New to the Iranian insect fauna.

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## فون مگس‌های سرگین (Diptera: Scathophagidae) در استان آذربایجان شرقی، همراه با گزارش هشت رکورد جدید برای ایران

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**چکیده:** نمونه‌های مورد مطالعه طی سال‌های ۱۳۸۹ تا ۱۳۹۲ از استان آذربایجان شرقی جمع‌آوری شدند. هشت گونه شامل *Cordilura rufipes* (Meigen, 1826)، *Gimnomera montana* Ozerov et *Parallelomma albipes* (Fallén)، *Norellisoma spinimana* (Fallén, 1819)، *Krivosheina*, 2013، *Scathophaga lutaria* (Fabricius, 1794)، *Scathophaga kaszabi* (Šifner, 1975)، 1819، *Scathophaga taeniopa* (Rondani, 1867) و *Scathophaga stercoraria* (Linnaeus, 1758) و چهار جنس شامل *Cordilura* Fallén, 1810، *Gimnomera* Rondani, 1866، *Norellisoma* Wahlgren, 1917، *Parallelomma* Becker, 1894 برای اولین بار از ایران گزارش می‌شوند. عکس و کلید گونه‌های خانواده Scathophagidae واقع در این منطقه ارائه شده‌است.

**واژگان کلیدی:** مگس‌های سرگین، فون، گزارش‌های جدید، استان آذربایجان شرقی، ایران