

Heteroptera (Insecta) fauna of Iranian cotton fields and surrounding grasslands

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Received on 3rd March, 2011, accepted on 31st March, 2011.

The Heteroptera fauna (Insecta) of Iranian cotton fields and surrounding areas is studied. A total of 103 species from 14 families were found. Among the collected material, 7 species are new records for Iranian fauna: *Cryptostemma (Pachycoleus) gracile* Josifov 1967, *Cryptostemma (Pachycoleus) utnapishtim* Linnavuori 1984, *Systelloderes utukhengal* Linnavuori 1984, *Phytocoris (Eckerleinius) paghmanus* Linnavuori 1974, *Himacerus (Himacerus) apterus* (Fabricius 1798), *Nabis (Dolichonabis) limbatus* Dahlbom 1851 and *Reduvius osiris* Kirkaldy 1909.

Keywords: Heteroptera, cotton field, Iran, faunistic.

La faune des Hétéroptères (Insecta) de champs de coton iraniens est étudiée. Un total de 103 espèces appartenant à 14 familles fut collecté. Parmi le matériel récolté, 7 espèces sont nouvelles pour la faune d'Iran: *Cryptostemma (Pachycoleus) gracile* Josifov 1967, *Cryptostemma (Pachycoleus) utnapishtim* Linnavuori 1984, *Systelloderes utukhengal* Linnavuori 1984, *Phytocoris (Eckerleinius) paghmanus* Linnavuori 1974, *Himacerus (Himacerus) apterus* (Fabricius 1798), *Nabis (Dolichonabis) limbatus* Dahlbom 1851 et *Reduvius osiris* Kirkaldy 1909.

Mots clés: Heteroptera, champs de coton, Iran, faunistique.

1. INTRODUCTION

Considering the importance of Heteroptera (Insecta) in the ecosystems and their positive or negative impacts on agriculture, it seems relevant to improve our knowledge on these insects.

Cotton has important role in human's life and economics. The insect fauna (pests, predators and parasitoids), especially bug fauna, in cotton fields throughout the world is diversified (Frisbie *et al.*, 1989; Ramalho, 1994; Williams *et al.*, 2000).

Although the fauna of Iranian Heteroptera was studied rather well (Modarres Awal, 1997; Ghahari *et al.*, 2009a, b, 2010 a, b), the fauna of Heteroptera of Iranian cotton fields was not studied in detail. The main work on Heteroptera of Iranian cotton fields was conducted by Ghahari and Ostovan (2006) in two provinces: Golestan and Mazandaran (Northern Iran).

In this framework, the Heteroptera fauna of Iranian cotton fields and neighbouring area was systematically analyzed for the first time and the obtained results are provided hereafter.

2. MATERIAL AND METHODS

The specimens were collected from the cotton fields (*Gossypium arboreum*, *Gossypium frutescens*, *Gossypium herbaceum*, and *Gossypium hirsutum*) and surrounding grasslands (especially from host plants of the family Malvaceae) of Iran. In this research, different areas of 19 provinces including Ardabil, Chaharmahal & Bakhtiari, East Azarbaijan, Fars, Golestan, Guilan, Hamedan, Isfahan, Kerman, Kermanshah, Khorasan, Khuzestan, Lurestan, Markazi, Mazandaran, Semnan, Tehran, West Azarbaijan and Yazd were sampled.

The collected specimens were sampled mainly by sweeping net (17" in diameter). The materials were put in ethanol 75 %, labeled (locality and date of collection) and for exact identification sent to the specialists. Since identification of *Orius* spp. is possible only by male genitalia, the collected specimens were separated sexually and the male genitalia were prepared. In addition to sampling in different cotton fields, materials were obtained from the insect collections of different universities.

The analyzed specimens are preserved in the collections of Islamic Azad University (IAU), Qaemshahr Islamic Azad University (QIAU), Shahre Rey Islamic Azad University (SRIAU), Cotton Research Institute (CRI), R. Linnavuori (R.L. collection), P. Puthskov (P.P. collection), P. Moulet (P.M. collection), Zoological Institut, Russian Academy of Sciences, St Petersburg, Russia (I.K. collection), H. Ostovan (H.O. collection), M. Havaskary (M.H. collection) and H. Ghahari (H.G. collection). The nomenclature follows the Catalogue of Palearctic Heteroptera

(Aukema & Rieger, 1995, 1996, 1999, 2001, 2006). Detailed information about synonymies and distribution of quoted species are available in this work (Aukema & Rieger, *op. cit.*).

3. RESULTS

A total of 103 species of Heteroptera were identified from Iranian cotton fields, surrounding grasslands, and neighbouring areas. The list of species is given below, classified by alphabetical order of their nomina.

Family Alydidae Amyot & Serville 1843

1. *Megalotomus junceus* (Scopoli 1763)

MATERIAL.- Isfahan province: Isfahan (*Ipomoea purpurea*, Convulvulaceae), 1♀, 2♂, October 2000; leg. H. Masjedian, det. R. Linnavuori, depository IAU.

Family Anthocoridae Fieber 1836

Subfamily Anthocorinae Fieber 1836

2. *Anthocoris angularis* Reuter 1884

MATERIAL.- Mazandaran province: Joibar (*Abelmoschus esculentus*, Malvaceae), 1♀, 1♂, August 1997. Golestan province: Kordkoy (cotton field), 1♂, September 2001; leg. H. Sakenin, det. H. Sakenin, depository QIAU.

3. *Anthocoris confusus* Reuter 1884

MATERIAL.- Golestan province: Gorgan (cotton field), 1♂, October 2001. East Azarbaijan province: Arasbaran (cotton field), 2♀, 3♂, September 2004; leg. M. Havaskary, det. H. Ostovan, depository M.H. collection.

4. *Anthocoris flavipes* Reuter 1884

MATERIAL.- East Azarbaijan province: Arasbaran (cotton field), 1♂, October 2003; leg. M. Havaskary, det. I. Kerzhner, depository M.H. collection.

5. *Anthocoris gallarumulmi* (De Geer 1773)

MATERIAL.- Golestan province: Kordkoy (*Hibiscus esculentus*, Malvaceae), 1♀, 1♂, August 2000; leg. H. Ghahari, det. H. Ostovan, depository IAU.

6. *Anthocoris limbatus* Fieber 1836

MATERIAL.- Tehran province: Varamin (cotton field), 1♂, September 2001. Mazandaran

province: Savadkooch (*Myrtus communis*, Myrtaceae), 1♀, 1♂, July 2003; leg. H. Sakenin, det. I. Kerzhner, depository QIAU.

7. *Anthocoris minki* Dohrn 1860

MATERIAL.- Mazandaran province: Qaemshahr (*Althea officinalis*, Malvaceae), 1♀, 1♂, August 1999. Ardabil province: Moghan (cotton field), 2♂, July 2001. Golestan province: Gonbad (cotton field), 2♂, October 2002; leg. H. Ghahari, det. R. Linnavuori, depository R.L. collection.

8. *Anthocoris nemoralis* (Fabricius 1794)

MATERIAL.- East Azarbaijan province: Arasbaran (cotton field), 1♂, October 2003. Mazandaran province: Chalus (*Jasminum fruticans*, Oleaceae), 1♀, 2♂, April 2004; leg. M. Tabari, det. R. Linnavuori, depository R.L. collection.

9. *Anthocoris nemorum* (Linnaeus 1761)

MATERIAL.- Mazandaran province: Galogah (cotton field), 1♂, July 2000. Semnan province: Garmsar (*Hibiscus trionum*, Malvaceae), 1♀, 2♂, September 2002; leg. H. Sakenin, det. R. Linnavuori, depository IAU.

10. *Anthocoris similimus* Poppius 1909

MATERIAL.- Mazandaran province: Behshahr (cotton field), 1♂, July 2001; leg. M. Tabari, det. I. Kerzhner, depository I.K. collection.

11. *Orius (Dimorphella) albidipennis* (Reuter 1884)

MATERIAL.- Mazandaran province: Neka (*Rubus odoratus*, Rosaceae), 2♂, August 1999. Ardabil province: Moghan (cotton field), 3♂, July 2000. Khorasan province: Kashmar (cotton field), 2♂, October 2001. Fars province: Darab (cotton field), 1♀, 1♂, July 2003; leg. H. Ghahari, det. H. Ostovan, depository H.G. collection.

12. *Orius (Heterorius) bulgaconus* Ghauri 1972

MATERIAL.- Isfahan province: Shahinshahr (*Melia azedarach*, Meliaceae), 1♂, April 1998. Golestan province: Gorgan (cotton field), 1♀, 2♂, October 2001; leg. H. Ghahari, det. H. Ostovan, depository H.O. collection.

13. *Orius (Heterorius) horvathi* (Reuter 1884)

MATERIAL.- Isfahan province: Najaf-Abad (*Absena velvetleaf*, Malvaceae), 1♀, 1♂, September 2006; leg. H. Rakhshani, det. H. Ostovan, depository H.O. collection.

14. *Orius (Heterorius) vicinus* (Ribaut 1923)

MATERIAL.- Mazandaran province: Behshahr (*Lavandula spica*, Lamiaceae), 2♂, August 1998. Golestan province: Gonbad (cotton field), 3♂, September 2001; leg. Z. Karimian, det. H. Ostovan, depository H.O. collection.

15. *Orius (Orius) laevigatus* (Fieber 1860)

MATERIAL.- Golestan province: Minoodasht (cotton field), 1♂, July 2001; leg. Z. Karimian, det. H. Ostovan, depository H.O. collection.

16. *Orius (Orius) niger* (Wolff 1811)

MATERIAL.- Fars province: Darab (cotton field), 1♀, 2♂, June 2000. Isfahan province: Isfahan (*Hibiscus cannabinus*, Malvaceae), 2♀, 1♂, August 2000. Mazandaran province: Qaemshahr (*Euphorbia geniculata*, Euphorbiaceae), 1♀, 1♂, September 1999. Golestan province: Salikandeh (cotton field), 1♂, June 2001. Semnan province: Garmsar (*Convolvulus arvensis*, Convolvulaceae), 2♀, 2♂, July 2002. Khorasan province: Kashmar (cotton field), 1♀, 2♂, October 2004; leg. A. Arefinia, H. Ghahari and H. Sakenin, det. H. Ostovan, depository H.O. and H.G. collections.

Family Coreidae Leach 1815

Subfamily Coreinae Stål 1867

17. *Haploprocta umbrina* Jakovlev 1883

MATERIAL.- East Azarbaijan province: Arasbaran (*Malva neglecta*, Malvaceae), 1♂, September 2005; leg. M. Havaskary, det. P. Putshkov, depository M.H. collection.

18. *Syromastus rhombeus* (Linnaeus 1767)

MATERIAL.- Mazandaran province: Chalus (*Chenopodium foliosum*, Chenopodiaceae), 1♀, August 1998. Fars province: Darab (*Hibiscus trionum*, Malvaceae), 1♂, August 2001; leg. H. Ghahari, A. Arefinia, det. P. Putshkov, depository P.P. collection.

19. *Phyllomorpha lacerata* Herrich-Schäffer 1835

MATERIAL.- Golestan province: Gonbad (cotton field), 1♀, October 2002; leg. Z. Karimian, det. R. Linnavuori, depository CRI.

Family Dipsocoridae Dohrn 1859

20. *Cryptostemma (Pachycoleus) gracile* Josifov 1967

MATERIAL.- Golestan province: Kordkoy (cotton field), 2♀, October 2001; leg. H. Sakenin, det. R.

Linnavuori, depository QIAU. **New record for Iran.**

21. *Cryptostemma (Pachycoleus) utnapishtim*
Linnavuori 1984

MATERIAL.- Isfahan province: Shahinshahr (*Tribulus terrestris*, Zygophyllaceae), 1♀, July 1999. Golestan province: Bandar-Torkman (*Corchorus capsularis*, Tiliaceae), 1♂, September 2001; leg. T. Darvish, det. R. Linnavuori, depository R.L. collection. **New record for Iran.**

Family Enicocephalidae Stål 1860

Subfamily Enicocephalinae Stål 1860

22. *Systelloderes utukhengal* Linnavuori 1984

MATERIAL.- Semnan province: Shahrood (*Malva montana*, Malvaceae), 1♀, August 2000, leg. H. Sakenin, det. R. Linnavuori, depository R.L. collection. **New record for Iran.**

Family Lygaeidae Schilling 1829

Subfamily Geocorinae Stål 1862

23. *Geocoris (Geocoris) arenarius* (Jakovlev 1867)

MATERIAL.- Mazandaran province: Qaemshahr (*Nerium oleander*, Apocynaceae), 1♂, June 1997. East Azarbaijan province: Arasbaran (cotton field), 1♀, September 2001; leg. H. Ghahari, det. P. Moulet, depository P.M. collection.

24. *Geocoris (Geocoris) megacephalus* (Rossi 1790)

MATERIAL.- Golestan province: Gorgan (cotton field), 2♀, 2♂, August 2001. Golestan province: Kordkoy (cotton field), 3♀, 2♂, September 2001. Kerman province: Kahnooj (*Sonchus asper*, Asteraceae), 1♂, October 2005. Mazandaran province: Behshahr (*Citrullus lanatus*, Cucurbitaceae), 2♀, 1♂, July 2006; leg. H. Ghahari, det. P. Moulet, depository P.M. collection.

25. *Geocoris (Geocoris) pallidipennis* (Costa 1843)

MATERIAL.- Golestan province: Ali-Abad (cotton field), 1♀, July 2000. Tehran province: Varamin (cotton field), 1♂, September 2002. Mazandaran province: Sari (*Plantago media*, Plantaginaceae), 1♀, 1♂, September 2003; leg. H. Ghahari, det. P. Moulet, depository P.M. collection.

26. *Geocoris (Piocoris) luridus* (Fieber 1844)

MATERIAL.- Mazandaran province: Neka (*Tradescantia virginica*, Commelinaceae), 1♀, October 1998. Golestan province: Bandar-Torkman (cotton field), 1♀, 1♂, July 2000; leg. Z. Karimian, det. R. Linnavuori, depository R.L. collection.

27. *Geocoris (Piocoris) quercicola* Linnavuori 1962

MATERIAL.- Golestan province: Gonbad (cotton field), 2♀, 1♂, June 2001; leg. H. Ghahari, det. R. Linnavuori, depository R.L. collection.

Subfamily Lygaeinae Stål 1862

28. *Arocatus rufipes* Stål 1872

MATERIAL.- East Azarbaijan province: Arasbaran (cotton field), 1♀, August 2004. Golestan province: Minoodasht (*Xanthium strumarium*, Asteraceae), 2♀, September 2006; leg. M. Havaskary, det. I. Kerzhner, depository M.H. collection.

29. *Lygaeus equestris* (Linnaeus 1758)

MATERIAL.- Golestan province: Minoodasht (cotton field), 2♂, September 2001; leg. H. Bayat, det. R. Linnavuori, depository CRI.

30. *Spilostethus pandurus* (Scopoli 1763)

MATERIAL.- Golestan province: Gorgan (cotton field), 1♂, July 2000. Khorasan province: Mashhad (*Sonchus oleraceus*, Asteraceae), 1♀, July 2001; leg. H. Bayat, det. R. Linnavuori, depository CRI.

31. *Tropidothorax leucopterus* (Goeze 1778)

MATERIAL.- Mazandaran province: Amol (*Verbena officinalis*, Verbenaceae), 1♂, October 1999. East Azarbaijan province: Arasbaran (cotton field), 1♀, 2♂, August 2004; leg. H. Sakenin, det. R. Linnavuori, depository QIAU.

Subfamily Orsillinae Stål 1872

32. *Nysius (Nysius) ericae* (Schilling 1829)

MATERIAL.- East Azarbaijan province: Arasbaran (cotton field), 2♀, 1♂, September 2005; leg. M. Havaskary, det. R. Linnavuori, depository M.H. collection.

33. *Nysius (Macroparius) cymoides* (Spinola 1837)

MATERIAL.- Isfahan province: Isfahan (*Althaea officinalis*, Malvaceae), 1♀, 1♂, August 1997; leg. H. Masjedian, det. I. Kerzhner, depository Unknown.

34. *Ortholomus punctipennis* (Herrich-Schäffer 1838)

MATERIAL.- East Azarbaijan province: Arasbaran (cotton field), 3♀, September 2003; leg. M. Havaskary, det. R. Linnavuori, depository M.H. collection.

Subfamily Oxycareninae Stål 1862**35. *Microplax interrupta*** (Fieber 1837)

MATERIAL.- Hamedan province: Hamedan (*Acer cappadocicum*, Aceraceae), 2♂, May 2001. Kermanshah province: Kermanshah (*Hibiscus syriacus*, Malvaceae), 1♀, June 2004; leg. H. Ghahari, det. P. Moulet, depository IAU.

Subfamily Rhyparochrominae Amyot & Serville 1843**36. *Aellopus atratus*** (Goeze 1778)

MATERIAL.- Isfahan province: Isfahan (*Euphorbia erythradenia*, Euphorbiaceae), 2♀, 2♂, June 2000. Markazi province: Arak (*Xanthium strumarium*, Asteraceae), 1♀, September 2001; leg. S. Ezzatpanah, det. R. Linnavuori, depository IAU.

37. *Drymus sylvaticus* (Fabricius 1775)

MATERIAL.- Kerman province: Kerman (*Amaranthus blitoides*, Amaranthaceae), 1♀, 1♂, July 2001. West Azarbaijan province: Ourmieh (*Raphanus raphanistrum*, Brassicaceae), 1♀, August 2003; leg. N. Samin, det. R. Linnavuori, depository IAU.

38. *Emblethis angustus* Montandon 1890

MATERIAL.- East Azarbaijan province: Arasbaran (cotton field), 4♀, 1♂, August 2001. Ardabil province: Moghan (*Crataegus microphylla*, Rosaceae), July 2004; leg. M. Havaskary, det. I. Kerzhner, depository M.H. collection.

39. *Ligyrocoris sylvestris* (Linnaeus 1758)

MATERIAL.- West Azarbaijan province: Mahabad (*Chenopodium murale*, Chenopodiaceae), 1♂, September 2000. Golestan province: Gonbad (cotton field), 2♀, June 2002; leg. H. Ghahari, Z. Karimian, det. I. Kerzhner, depository CRI.

Family Miridae Hahn 1833**Subfamily Deraeocorinae Douglas & Scott 1865****40. *Deraeocoris (Camptobrochis) pallens*** (Reuter 1904)

MATERIAL.- Golestan province: Ali-Abad (cotton field), 3♀, 1♂, September 1998. Mazandaran province: Galogah (*Lactuca orientalis*, Asteraceae), 2♀, October 1999; leg. H. Sakenin, det. R. Linnavuori, depository R.L. collection.

41. *Deraeocoris (Camptobrochis) punctulatus* (Fallén 1807)

MATERIAL.- East Azarbaijan province: Arasbaran (cotton field), 2♀, June 2004; leg. M. Havaskary, det. R. Linnavuori, depository R.L. collection.

42. *Deraeocoris (Knightocapsus) lutescens* (Schilling 1837)

MATERIAL.- Khorasan province: Neyshaboor (*Amaranthus retroflexus*, Amaranthaceae), 1♀, 1♂, August 2001. Kerman province: Jiroft (*Malva silvestris*, Malvaceae), 1♀, September 2003; leg. H. Ghahari, det. R. Linnavuori, depository IAU.

43. *Stethoconus ocellaris* Linnavuori 1995

MATERIAL.- East Azarbaijan province: Arasbaran (cotton field), 1♀, September 2003, leg. M. Havaskary, det. R. Linnavuori, depository R.L. collection.

Subfamily Isometopinae Fieber 1860**44. *Isometopus intrusus*** (Herrich-Schaeffer 1835)

MATERIAL.- Tehran province: Varamin (*Amaranthus blitoides*, Amaranthaceae), 1♀, August 2003. Khorasan province: Kashmar (*Malva silvestris*, Malvaceae), 1♀, October 2005; leg. S. Asgari, det. I. Kerzhner, depository Unknown.

Subfamily Mirinae Hahn 1833**45. *Lygus pratensis*** (Linnaeus 1758)

MATERIAL.- Golestan province: Kordkoy (*Vaccaria pyramidata*, Caryophyllaceae), 1♀, August 1998. Khorasan province: Kashmar (cotton field), 1♀, August 2000; leg. H. Bayat, det. R. Linnavuori, depository CRI.

46. *Miris persicus* (Reuter 1876)

MATERIAL.- Tehran province: Varamin (cotton field), 3♀, 2♂, September 2001. Chaharmahal & Bakhtiari province: Shahrekord (*Malva parviflora*,

Malvaceae), 1♀, 2♂, June 2002; leg. H. Ghahari, det. R. Linnavuori, depository IAU.

47. *Phytocoris (Eckerleinius) paghmanus* Linnavuori 1974

MATERIAL.- Fars province: Shiraz (*Hibiscus mutabilis*, Malvaceae), 1♀, November 2000; leg. S. Taghizadeh, det. R. Linnavuori, depository R.L. collection. **New record for Iran.**

48. *Phytocoris (Eriamiris) djerablisus* Linnavuori 1974

MATERIAL.- Semnan province: Garmsar (*Hibiscus rosa-sinensis*, Malvaceae), 1♀, September 2001. Golestan province: Ali-Abad (cotton field), 1♂, October 2001; leg. H. Sakenin, det. R. Linnavuori, depository R.L. collection.

49. *Polymerus (Poeciloscytus) forughae* Linnavuori 2000

MATERIAL.- Khorasan province: Mashhad (*Ajuga gorganica*, Malvaceae), 2♀, 1♂, October 2003; leg. Unknown, det. R. Linnavuori, depository R.L. collection.

50. *Stenodema (Brachystira) calcarata* (Fallén 1807)

MATERIAL.- Mazandaran province: Behshahr (*Euphorbia pulcherrima*, Euphorbiaceae), 2♀, 1♂, July 2004; leg. Unknown, det. R. Linnavuori, depository IAU.

Subfamily Orthotylinae Van Duzee 1916

51. *Globiceps (Globiceps) coryli* Putshkov 1970

MATERIAL.- Semnan province: Shahrood (*Calendula persica*, Asteraceae), 2♀, September 2001. Fars province: Darab (*Berberis vulgaris*, Berberidaceae), 1♂, June 2002; leg. A. Arefinia, det. R. Linnavuori, depository R.L. collection.

52. *Halticus darbandikhanus* Linnavuori 1984

MATERIAL.- Semnan province: Garmsar (cotton field), 1♀, September 2001. Chaharmahal & Bakhtiari province: Shahrekord (*Polygonum convolvulus*, Polygonaceae), 1♀, April 2002; leg. H. Hashemi, det. R. Linnavuori, depository R.L. collection.

53. *Melanotrichius flavosparsus* (C.R. Sahlberg 1841)

MATERIAL.- Mazandaran province: Qaemshahr (*Xanthium spinosum*, Asteraceae), 2♀, May 2000. Golestan province: Ali-Abad (*Malva silvestris*,

Malvaceae), 1♀, September 2001; leg. H. Bayat, det. R. Linnavuori, depository CRI.

54. *Melanotrichius rudbaricus* (Linnavuori 1997)

MATERIAL.- Semnan province: Garmsar (*Hibiscus syriacus*, Malvaceae), 2♀, 2♂, September 2005; leg. J. Rastegari, det. R. Linnavuori, depository R.L. collection.

55. *Orthotylus (Orthotylus) marginalis* Reuter 1883

MATERIAL.- Mazandaran province: Galogah (*Sonchus asper*, Asteraceae), 1♀, September 1998; leg. H. Sakenin, det. R. Linnavuori, depository QIAU.

56. *Orthotylus (Orthotylus) prunicola* Linnavuori 1984

MATERIAL.- East Azarbaijan province: Arasbaran (cotton field), 1♀, July 2004; leg. M. Havaskary, det. R. Linnavuori, depository R.L. collection.

57. *Strongylocoris leucocephalus* (Linnaeus 1758)

MATERIAL.- Kerman province: Jiroft (*Sinapis arvensis*, Brassicaceae), 1♀, August 2000. Khorasan province: Kashmar (*Ajuga gorganica*, Malvaceae), 1♀, October 2003; leg. Unknown, det. R. Linnavuori, depository IAU.

Subfamily Phylinae Douglas & Scott 1865

58. *Psallus (Phylidea) ninurta* (Linnavuori 1984)

MATERIAL.- Golestan province: Gorgan (cotton field), 1♀, September 2001. Hamedan province: Nahavand (*Adiantum capillus-veneris*, Adiantaceae), 1♀, August 2005; leg. H. Ghahari, det. R. Linnavuori, depository R.L. collection.

59. *Campylomma diversicorne* Reuter 1878

MATERIAL.- Ardabil province: Moghan (*Malva parviflora*, Malvaceae), 1♀, July 2000. Golestan province: Gonbad (*Baddlia davidii*, Baddliaceae), 1♂, April 2001. Mazandaran province: Sari (cotton field), 1♀, September 2001; leg. H. Sakenin, det. R. Linnavuori, depository QIAU.

60. *Campylomma verbasci* (Meyer-Dür 1843)

MATERIAL.- Golestan province: Gorgan (*Hedera helix*, Araliaceae), 1♀, 2♂, July 2001. Kerman province: Jiroft (*Hibiscus mutabilis*, Malvaceae), 1♀, 2♂, August 2003; leg. H. Hashemi, det. R. Linnavuori, depository IAU.

61. *Compsidolon (Apsinthophylus) qoshanum* Linnavuori 1984

MATERIAL.- Mazandaran province: Behshahr (*Colocasia esculenta*, Araceae), 1♀, November 1997; leg. Z. Karimian, det. R. Linnavuori, depository R.L. collection.

62. *Glaphyrocoris iranicus* Linnavuori 1965

MATERIAL.- Kermanshah province: Kermanshah (*Corchorus olitorius*, Tiliaceae), 1♀, 1♂, October 2001; leg. A. Valizadeh, det. R. Linnavuori, depository R.L. collection.

63. *Plagiognathus (Plagiognathus) bipunctatus* Reuter 1883

MATERIAL.- Khuzestan province: Ahwaz (*Eragrostis poaeoides*, Poaceae), 1♀, September 1996. Mazandaran province: Qaemshahr (*Azalea pontica*, Ericaceae), 1♂, May 1998. Khorasan province: Kashmar (cotton field), 1♀, October 2002; leg. H. Esfandiari, H. Sakenin, det. R. Linnavuori, depository QIAU.

64. *Plagiognathus (Plagiognathus) fulvipennis* (Kirschbaum 1856)

MATERIAL.- Khorasan province: Sabzevar (*Mirabilis julapa*, Nyctaginaceae), 1♀, 1♂ October 2000. Golestan province: Gorgan (cotton field), 1♀, September 2002; leg. H. Bayat, det. R. Linnavuori, depository Unknown.

65. *Tuponia concinna* (Reuter 1875)

MATERIAL.- Mazandaran province: Qaemshahr (*Malva neglecta*, Malvaceae), 2♀, March 1999; leg. H. Ghahari, det. R. Linnavuori, depository QIAU.

Family Pentatomidae Leach 1815**Subfamily Pentatominae Amyot & Serville 1843****66. *Andrallus spinidens*** (Fabricius 1787)

MATERIAL.- Guilan province: Fooman (*Alcea hyrcana*, Malvaceae) 2♀, August 2003. Mazandaran province: Behshahr (*Malva montana*, Malvaceae), 4♀, 2♂, September 2006; leg. H. Ghahari, det. P. Moulet, depository H.G. collection.

67. *Gomphocranum adad* Linnavuori 1984

MATERIAL.- Tehran province: Damavand (*Lavandula vera*, Lamiaceae), 1♂, July 2001. Golestan province: Minoodasht (cotton field), 1♀,

July 2004; leg. M. Havaskary, det. R. Linnavuori, depository R.L. collection.

68. *Gomphocranum anu* Linnavuori 1984

MATERIAL.- Isfahan province: Najaf-Abad (*Malva parviflora*, Malvaceae), 1♀, 2♂, August 1998; leg. A. Hadian, det. R. Linnavuori, depository R.L. collection.

69. *Nezara viridula* (Linnaeus 1758)

MATERIAL.- Golestan province: Gorgan (cotton field), 4♀, 2♂, April 2001; leg. H. Ghahari, det. P. Moulet, depository H.G. collection.

70. *Palomena mursili* Linnavuori 1984

MATERIAL.- Chaharmahal & Bakhtiari province: Shahrekord (*Rumex scutatus*, Polygonaceae), 2♀, 1♂, July 2001. Golestan province: Nokandeh (cotton field), 1♀, October 2002; leg. Unknown, det. R. Linnavuori, depository R.L. collection.

71. *Tholagmus enkidu* Linnavuori 1984

MATERIAL.- Golestan province: Salikandeh (cotton field), 1♀, 1♂, August 2000; leg. Z. Karimian, det. R. Linnavuori, depository R.L. collection.

Family Nabidae A. Costa 1853**Subfamily Prostemmatinae Reuter 1890****72. *Prostemma kiborti*** Jakovlev 1889

MATERIAL.- Golestan province: Gorgan (cotton field), 1♀, 1♂, July 2001. Mazandaran province: Ramsar (*Convolvulus arvensis*, Convolvulaceae), 1♂, October 2004; leg. H. Ghahari, det. I. Kerzhner, depository IAU.

Subfamily Nabinae A. Costa 1853**73. *Himacerus (Himacerus) apterus*** (Fabricius 1798)

MATERIAL.- Isfahan province: Najaf-Abad (*Althaea officinalis*, Malvaceae), 1♀, August 1998; leg. A. Hadian, det. I. Kerzhner, depository I.K. collection. **New record for Iran.**

74. *Nabis (Dolichonabis) limbatus* Dahlbom 1851

MATERIAL.- Kerman province: Jiroft (*Hibiscus rosa-sinensis*, Malvaceae), 1♀, 1♂, July 2002; leg. G. Abbaszadeh, det. I. Kerzhner, depository I.K. collection. **New record for Iran.**

75. *Nabis (Milu) reuteri* Jakovlev 1876

MATERIAL.- Golestan province: Kordkoy (cotton field), 1♀, July 2001; leg. H. Ghahari, det. I. Kerzhner, depository SRIAU.

76. *Nabis (Nabis) palifer* Seidenstücker 1954

MATERIAL.- Mazandaran province: Qaemshahr (*Melia azedarach*, Meliaceae), 2♀, 1♂, November 2000. Tehran province: Varamin (cotton field), 2♀, August 2001. Fars province: Darab (cotton field), 2♀, 2♂, June 2002. Ardabil province: Moghan (cotton field), 1♀, 2♂, July 2003. Khorasan province: Kashmar (cotton field), 1♂, October 2003. Semnan province: Garmsar (cotton field), 2♀, 2♂, April 2005; leg. H. Ghahari, det. P. Moulet, depository H.G. collection and SRIAU.

77. *Nabis (Nabis) pseudoferus* Remane 1949

MATERIAL.- Yazd province: Meibod (*Malva montana*, Malvaceae), 1♂, July 2002; leg. R. Salavatian, det. I. Kerzhner, depository I.K. collection.

78. *Nabis (Tropiconabis) capsiformis* Germar 1838

MATERIAL.- Golestan province: Azadshahr (*Malva neglecta*, Malvaceae), 3♀, 1♂, April 2000. Golestan province: Minoodasht (*Hibiscus trionum*, Malvaceae), 2♀, 2♂, August 2001; leg. H. Ghahari, det. I. Kerzhner, depository I.K. collection.

Family Pyrrhocoridae Amyot & Serville 1843**79. *Pyrrhocoris apterus* (Linnaeus 1758)**

MATERIAL.- Golestan province: Gorgan (cotton field), 2♀, September 2001. Semnan province: Semnan (*Rumex scutatus*, Polygonaceae), 1♀, October 2002; leg. H. Sakenin, det. I. Kerzhner, depository QIAU.

80. *Pyrrhocoris sinuaticollis* Reuter 1885

MATERIAL.- Isfahan province: Isfahan (*Hibiscus trionum*, Malvaceae), 1♂, April 1998. Khorasan province: Bojnord (*Abutilon theophrasti*, Malvaceae), 2♀, 2♂, October 2000; leg. H. Masjedian, det. R. Linnavuori, depository Unknown.

Family Reduviidae Latreille 1807**Subfamily Harpactorinae Amyot & Serville 1843****81. *Coranus (Coranus) aegyptius* (Fabricius 1775)**

MATERIAL.- Fars province: Darab (cotton field), 1♀, 1♂, June 2002; leg. A. Arefinia, det. R. Linnavuori, depository R.L. collection.

82. *Coranus griseus* (Rossi 1790)

MATERIAL.- Golestan province: Gonbad (cotton field), 1♀, August 2001. Khorasan province: Bojnord (*Physalis angulata*, Solanaceae), 2♂, July 2002; leg. H. Ghahari, det. P. Moulet, depository P.M. collection.

83. *Rhynocoris (Rhynocoris) flavolimbatus* (Jakovlev 1889)

MATERIAL.- Golestan province: Salikandeh (cotton field), 2♀, July 2002. Mazandaran province: Behshahr (*Malva silvestris*, Malvaceae), 1♀, March 2003; leg. H. Ghahari, det. P. Moulet, depository P.M. and H.G. collections.

84. *Rhynocoris (Rhynocoris) ibericus* Kolenati 1857

MATERIAL.- Mazandaran province: Sari (*Trifolium pratensis*, Fabaceae), 1♀, 1♂, April 1999. Fars province: Darab (cotton field), 1♀, June 2002. East Azarbaijan province: Arasbaran (cotton field), 1♂, July 2005; leg. H. Sakenin, A. Arefinia, det. I. Kerzhner, depository QIAU.

85. *Rhynocoris (Rhynocoris) punctiventris* (Herrich.-Schaeffer 1846)

MATERIAL.- Isfahan province: Shahreza (*Althea rosea*, Malvaceae), 1♀, October 1999. Fars province: Darab (cotton field), 2♀, 2♂, June 2002; leg. H. Ghahari, A. Arefinia, det. P. Putshkov, depository P.P. collection.

86. *Rhynocoris (Rhynocoris) violentus* (Germar 1837)

MATERIAL.- Khorasan province: Kashmar (cotton field), 1♀, 1♂, October 2003; leg. H. Ghahari, det. P. Putshkov, depository P.P. collection.

Subfamily Peiratinae Amyot & Serville 1843**87. *Peirates hybridus*** (Scopoli 1763)

MATERIAL.- West Azarbaijan province: Ourmieh (*Malva parviflora*, Malvaceae), 1♂, September 2000; leg. H. Ghahari, det. P. Putshkov, depository IAU.

88. *Peirates sin* Linnavuori 1984

MATERIAL.- Golestan province: Ali-Abad (cotton field), 1♂, April 2000. Mazandaran province: Neka (*Vitex pseudo-negundo*, Verbenaceae), 1♂, August 2005; leg. H. Ghahari, det. R. Linnavuori, depository R.L. collection.

Subfamily Reduviinae Latreille 1807**89. *Reduvius jakovleffi*** Reuter 1892

MATERIAL.- Mazandaran province: Sari (*Camelia japonica*, Teaceae), 1♀, September 2002. East Azarbaijan province: Arasbaran (cotton field), 1♀, 1♂, April 2004; leg. H. Ghahari, det. P. Putshkov, depository P.P. collection.

90. *Reduvius osiris* Kirkaldy 1909

MATERIAL.- Isfahan province: Najaf-Abad (*Corchorus olitorius*, Tilliaceae), 1♀, August 1999; leg. H. Ghahari, det. P. Putshkov, depository P.P. collection. **New record for Iran.**

91. *Reduvius pallipes* Klug 1830

MATERIAL.- Mazandaran province: Sari (*Atraphaxis spinosa*, Polygonaceae), 1♀, July 2000. Ardabil province: Moghan (cotton field), 1♀, July 2002; leg. H. Ghahari, det. P. Putshkov, depository P.P. collection.

92. *Reduvius testaceus* (Herrich-Schaeffer 1845)

MATERIAL.- Golestan province: Gorgan (cotton field), 1♀, August 2003. Golestan province: Minoodasht (*Malva neglecta*, Malvaceae), 1♂, May 2006; leg. H. Ghahari, det. P. Putshkov, depository P.P. collection.

Family Rhopalidae Dallas 1852**93. *Corizus hyosecyami*** (Linnaeus 1758)

MATERIAL.- Golestan province: Azadshahr (cotton field), 1♂, July 2000; leg. T. Mojeini, det. R. Linnavuori, depository R.L. collection.

94. *Stictopleurus crassicornis* (Linnaeus 1758)

MATERIAL.- East Azarbaijan province: Arasbaran (*Malva neglecta*, Malvaceae), 3♀, 2♂, October

2001; leg. M. Havaskary, det. I. Kerzhner, depository I.K. collection.

Family Scutelleridae Leach 1815**95. *Odontotarsus angustatus*** Jakovlev 1884

MATERIAL.- Markazi province: Arak (*Ephedra* sp., Ephedraceae), 2♀, June 2001. Isfahan province: Isfahan (*Rumex scutattus* L., Polygonaceae), 1♂, April 2004; leg. S. Ezzatpanah, det. I. Kerzhner, depository I.K. collection.

96. *Odontotarsus purpureolineatus* (Rossi 1790)

MATERIAL.- East Azarbaijan province: Arasbaran (cotton field), 1♀, 2♂, September 2002; leg. M. Havaskary, det. I. Kerzhner, depository I.K. collection.

97. *Promecocoris laticollis* (Jakovlev 1885)

MATERIAL.- Mazandaran province: Neka, and Behshahr (*Malva neglecta*, Malvaceae), 2♀, 1♂, May 2003; leg. M. Tabari, det. R. Linnavuori, depository R.L. collection.

Family Stenocephalidae Dallas 1852**98. *Dicranocephalus agilis*** (Scopoli 1763)

MATERIAL.- Semnan province: Shahrood (*Malva montana*, Malvaceae), 2♀, 2♂, October 2003; leg. H. Sakenin, det. R. Linnavuori, depository QIAU.

Family Tingidae Laporte 1832**Subfamily Tinginae Laporte 1832****99. *Agramma (Agramma) atricapillum*** (Spinola 1837)

MATERIAL.- Lorestan province: Noor-Abad (*Ricinus communis*, Euphorbiaceae), 1♂, October 2000; leg. Z. Amirian, det. R. Linnavuori, depository QIAU.

100. *Derephysia (Derephysia) foliacea* (Fallén 1807)

MATERIAL.- Khorasan province: Khalil-Abad (cotton field), 1♀, 1♂, June 2001; leg. M. Hashemi, det. R. Linnavuori, depository R.L. collection.

101. *Leptoypha capitata* (Jakovlev 1876)

MATERIAL.- Fars province: Darab (cotton field), 1♀, October 2002; leg. A. Arefinia, det. I. Kerzhner, depository I.K. collection.

102. *Physatocheila distinguenda* (Jakovlev 1880)

MATERIAL.- East Azarbaijan province: Arasbaran (cotton field), 1♀, July 2004; leg. M. Havaskary, det. I. Kerzhner, depository M.H. collection.

103. *Tingis (Tingis) cardui* (Linnaeus 1758)

MATERIAL.- Kermanshah province: Sahneh (*Malva parviflora*, Malvaceae), 2♀, April 2000. Guilan province: Lahijan (*Glycyrrhiza glabra*, Fabaceae), 1♀, 2♂, May 2006; leg. M. Ashkanian, det. I. Kerzhner, depository I.K. collection.

4. DISCUSSION

The faunistic results of this research indicate that there is a diverse fauna of Heteroptera in Iranian cotton fields and neighbouring areas. A total of 103 Heteroptera species of 14 families were collected in cotton fields and surrounding grasslands. Since Iran is a large country with diverse flora as the host plants of Heteroptera, it is expected that a large number of additional Heteroptera species and new records will be discovered in the future. The fauna of predator bugs (Heteroptera) in cotton fields of Iran is also diversified. Some of them could be efficient natural enemies of different cotton pests and consequently useful in biological control. Over the 103 species identified in this paper, more than 30 species are predators and could have useful role in biological control and integrated pest management programs.

Acknowledgement

The authors are indebted to P. Putshkov of Ukraine and I.M. Kerzhner of Russia for identification of some specimens. We are also thanks to H. Bayat (Former Chief of Iran Cotton Research Institute) and some other Iranian researchers for collecting specimens or loaning the necessary data. We are also grateful to H.R. Mohebbi for determining the host plants. The research was supported by Islamic Azad University, Free University of Brussels and Museum Requien of France.

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