

## Mites associated with some medicinal plants (Asteraceae) in Hamedan, Iran

Farshad Masoudian and Mohammad Khanjani\*

Department of Plant Protection, College of Agriculture, Bu Ali-Sina University, Hamadan, Iran.

**Abstract:** Medicinal plants have been used from the past to present. Different small arthropods such as Acari were found on these plants. Therefore a study on the Acari fauna associated with some medicinal plants (Family: Asteraceae) in Hamedan region was carried out during 2008–2009. In this survey, 23 species belonging to 18 genera from 15 different families of the subclass Acari were collected and identified. Two spotted spider mite (*Tetranychus urticae* Koch) was determined as an abundant phytophagous mite species in this study.

**Keywords:** fauna, mites, phytophagous, predator, medicinal plants.

### Introduction

Hamadan province, western Iran, is the place where the value of medicinal plants was first discovered. The Bu Ali Sina medicinal plants garden and nursery is located in Hamedan. This garden has many visitors from all over the world every year. Three hundred and ninety four (394) species of medicinal plants are grown in Hamedan province (Kalvandi *et al.*, 2007) among which the Asteraceae is one the most diverse families that hosts various arthropods *e.g.* phytophagous, ectoparasitic and predatory mites. Phytophagous mites, especially tetranychids, can damage medicinal plants. Gupta and Karmakar (2010) reported the Tetranychidae as major pests of medicinal plants in India and *Tetranychus urticae* Koch was regarded by them as a new threat to these plants in the country (Sharma and Agarwal 2010). The present survey was conducted because our

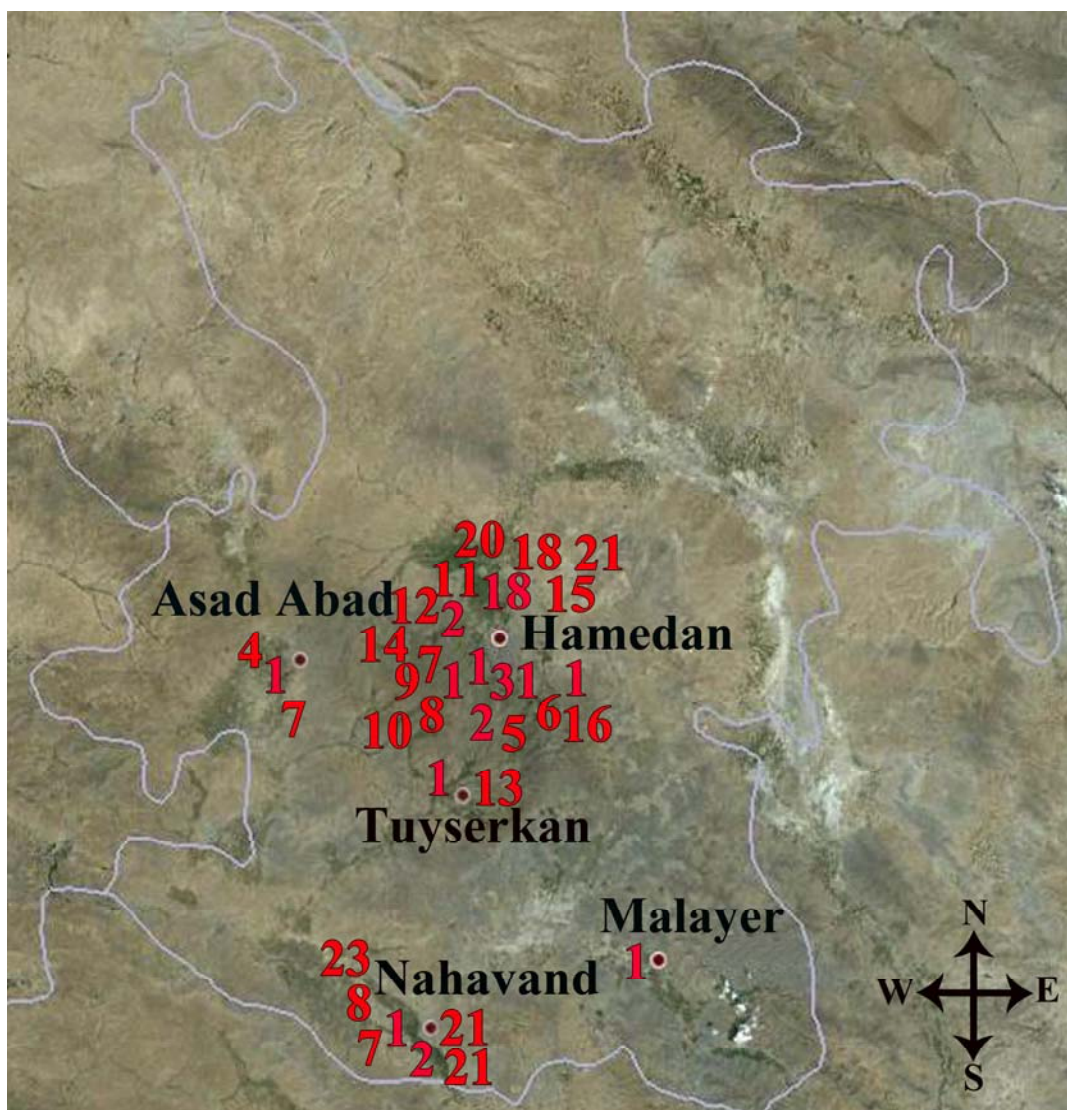
knowledge on the fauna of mites on medicinal plants in Iran is fragmentary and was also aimed at the identification of predatory mites with the potential to manage phytophagous mites and small insect pests on medicinal plants.

### Materials and Methods

The mites were collected from the foliage and other parts of medicinal plants of the family Asteraceae (shaking over a white tray). The specimens were mounted on microscope slides in Hoyer's medium. All specimens were examined under an Olympus BX51 microscope (DIC). A map indicating sampling locations is provided (Figure 1). All specimens were collected by F. Masoudian; the collected and identified slide specimens were deposited in the Mite Collection of the Acarology Laboratory, University of Bu–Ali Sina, Hamedan, Iran.

Handling Editor: Dr. Hamidreza Hajiyanbar

\* **Corresponding author**, e-mail: mkhanjani@gmail.com  
Received: 16 February 2013; Accepted: 17 April 2013



**Figure 1** Distribution map of mites collected in this study (Map extracted from Google earth © 2011 Europe Technologies).

List of collected specimens as indicated in map of the study area.

N	Species	N	Species
1	<i>Tetranychus urticae</i>	13	<i>Cunaxa capreolus</i>
2	<i>Tetranychus turkestani</i>	14	<i>Spinibdella cornini</i>
3	<i>Eutetranychus orientalis</i>	15	<i>Erythraeus (Zaracarus) ueckermanni</i>
4	<i>Bryobia mirmoayedii</i>	16	<i>Erythraeus (Erythraeus) mirabi</i>
5	<i>Bryobia praetiosa</i>	17	<i>Erythraeus (Erythraeus) garmsaricus</i>
6	<i>Aegyptobia salicicola</i>	18	<i>Allothrombium ovatum</i>
7	<i>Anystis baccharum</i>	19	<i>Neoseiulus bicaudus</i>
8	<i>Tydeus caryae</i>	20	<i>Typhlodromus (Anthoseius) iraniensis</i>
9	<i>Stigmaeus pilatus</i>	21	<i>Lasioseius youcefi</i>
10	<i>Eupalopsellus ueckermanni</i>	22	<i>Veigaia nemorensis</i>
11	<i>Eupalopsellus hamedaniensis</i>	23	<i>Alliphis halleri</i>
12	<i>Raphignathus hecmataniensis</i>		

## Results

### Tetranychidae Donnadieu, 1875

#### *Tetranychus* Dufour, 1832

#### *Tetranychus urticae* Koch, 1836

**Material examined:** Medicinal plants garden in Hamedan vicinity (34° 46' 23.23" N, 48° 30' 56.3" E, 1931 m a.s.l.) 16 vi 2008, 13 (♀♀) 5 (♂♂), Feverfew, *Tanacetum parthenium* (L.) Sch. Bip; 16 vi 2008, 7 (♀♀) 2 (♂♂) Ginger, *Zingiber officinale* Roscoe; 15 vii 2009, 9 (♀♀) 2 (♂♂) on Holy thistle, *Centaurea benedicta* L.; 30 vii 2009, Yarrow, *Achillea millefolium* L., and 20 vii 2008, 6 (♀♀) 1 (♂) on Safflower, *Carthamus tinctorius* L.; Agricultural faculty of Bu–Ali Sina University in Hamedan vicinity (34° 48' 11.30" N, 48° 28' 55.13" E, 1822 m a.s.l.), 26 vi 2008, 7 (♀♀) 3 (♂♂) on Safflower, *Carthamus tinctorius* L.; Abbass Abad in Hamedan vicinity (34° 47' 11.45" N, 48° 27' 57.88" E, 1986 m a.s.l.), 08 viii 2008, 4 (♀♀) 2 (♂♂) on Prickly lettuce, *Lactuca serriola* L.; Ganjnameh in Hamedan vicinity (34° 45' 41.91" N, 48° 26' 46.92" E, 2130 m a.s.l.), 27 vi 2009, 3 (♀♀) 1 (♂) on Safflower, *Carthamus tinctorius* L.; Sarab Gamasiab in Nahavand vicinity from Hamedan Province (34° 02' 47.22" N, 48° 22' 26.39" E, 1840 m a.s.l.), 15 viii 2009, 12 (♀♀) 2 (♂♂) on Cotton thistle, *Onopordum acanthium* L.; Shahrestaneh, Toyserkan vicinity in Hamedan Province (34° 42' 29.76" N, 48° 21' 53.51" E, 2154 m a.s.l.), 15 viii 2009, 9 (♀♀) 3 (♂♂) on Cotton thistle, *Onopordum acanthium* L.; Malayer vicinity from Hamedan Province (34° 19' 14.79" N, 48° 46' 25.51" E, 1724 m a.s.l.), 9 v 2009 on Creeping thistle, *Cirsium arvense* (L.) Scop.; Asadabad vicinity of Hamedan province 34° 46' 21.43" N, 48° 07' 02.45" E, 1577 m a.s.l.); 14 vi 2009, 7 (♀♀) 1 (♂) on Echinops plant, *Echinops orientalis* Trautv. and 17 vii 2009, 13 (♀♀) 5 (♂♂) on Mugwort, *Artemisia aucheri* Boiss; Heydareh village in Hamedan vicinity in Hamedan Province (34° 48' 11.80" N, 48° 28' 23.04" E, 1840 m a.s.l.), 16 x 2009, 10 (♀♀) 2 (♂♂) on Chicory, *Cichorium intybus* L. and 6 (♀♀) 1 (♂); Cornflower, *Centaurea cyanus* L.; Sheverin village of Hamedan vicinity (34° 51'

51.07" N, 48° 35' 42.61" E, 1752 m a.s.l.); 19 vi 2009, 16 (♀♀) 6 (♂♂) on Sunflower, *Helianthus annuus* L. and 14 v 2008 – 08 vi 2009 on Russian knapweed, *Acroptilon repens* (L.); Dare Morad Beigh village in Hamedan vicinity (34° 44' 38.52" N, 48° 30' 10.61" E, 2114 m a.s.l.); 17 vi 2009, 8 (♀♀) 2 (♂♂) on Greater burdock, *Arctium lappa* L.

**Previous records from Iran:** Davachi and Taghizadeh (1955); Khalil Manesh (1973); Sepasgozarian (1977); Khanjani (1996), Modarres Awal (2002), Khanjani and Haddad Irani -Nejad (2006); Sadeghi Namaghi (2010).

**Remarks:** This species was collected frequently in this study.

#### *Tetranychus turkestanii* (Ugarov & Nikolski, 1937)

**Material examined:** Heydareh village of Hamedan Province (34° 48' 04.23" N, 48° 28' 15.95" E, 1855 m a.s.l.), 16 vi 2008, 4 (♀♀) 2 (♂♂) on Yarrow, *Achillea millefolium* L.; Agricultural faculty of Bu–Ali Sina University of Hamedan Province (34° 48' 11.30" N, 48° 28' 55.13" E, 1822 m a.s.l.), 10 viii 2008, 3 (♀♀) 1 (♂) on Russian knapweed, *Acroptilon repens* (L.); Sarab Gamasiab in Nahvand vicinity (34° 02' 47.22" N, 48° 22' 26.39" E, 1840 m a.s.l.), 3 ix 2009, 8 (♀♀) 2 (♂♂) on Prickly lettuce, *Lactuca serriola* L.; Shahrestaneh of Toyserkan vicinity in Hamedan Province, 34° 42' 29.76" N, 48° 21' 53.51" E, 2154 m a.s.l.), 15 viii 2009 3 (♀♀) 1 (♂) on Chicory, *Cichorium intybus* L.

**Previous records from Iran:** Daneshvar (1974); Khalil-Manesh (1973); Sepasgozarian 1977; Khanjani (1996), Khanjani and Haddad Irani-Nejad (2006); Sadeghi Namaghi and Kamali (1993); Sadeghi Namaghi (2010).

#### *Eutetranychus orientalis* (Klein, 1936)

**Material examined:** Abbass Abad of Hamedan Province (34° 47' 11.45" N, 47° 27' 57.88" E, 1986 m a.s.l.), 26 viii 2009, 4 (♀♀) 2 (♂♂) on Prickly lettuce, *Lactuca serriola* L.

**Previous records from Iran:** Farahbakhsh (1961); Khalil Manesh (1973); Sepasgozarian (1977); Khanjani and Haddad Irani-Nejad (2006); Kamali *et al.* (2001); Modarres Awal (2002).

**Bryobia Koch, 1836****Bryobia mirmoayedii Khanjani, Gotoh & Kitashima, 2008**

**Material examined:** Asadabad in vicinity of Hamedan Province (34° 46' 21.43" N, 48° 07' 02.45" E, 1577 m a.s.l.), 06 v 2009, 4 (♀♀) 1 (♂) on Sunflower, *Helianthus annuus* L. and 12 viii 2009, 2 (♀♀), Wild safflower, *Carthamus oxyacantha* M. Bieb.

**Previous record from Iran:** Khanjani *et al.*, 2008.

**Bryobia praetiosa Koch, 1835**

**Material examined:** Faculty of Agriculture, Bu-Ali Sina University of Hamedan Province (34° 48' 12.47" N, 48° 29' 02.67" E, 1821 m a.s.l.), 11 vii 2009, 4 (♀♀) on Echinops plant, *Echinops orientalis* Trautv.

**Previous records from Iran:** Farahbakhsh (1961); Khalil Manesh (1973); Kamali (1990); Mehrnejad and Ueckermann (2001); Modarres Awal (2002); Khanjani and Kamali (1993, 2000); Khanjani and Haddad Irani-Nejad (2006); Izadi *et al.*, (2010).

**Tenuipalpidae Berlese, 1913****Aegyptobia Sayed, 1950****Aegyptobia salicicola Al-Gboory, 1987**

**Material examined:** Ganjnameh region of Hamedan Province (34° 46' 21.26" N, 48° 27' 29.01" E, 2068 m a.s.l.), 28 viii 2009, 3 (♀♀) on Chicory, *Cichorium intybus* L.

**Anystidae, Oudemans, 1936****Anystis von Heyden, 1826****Anystis baccarum (Linnaeus, 1758)**

**Material examined:** Medicinal garden of Jehad Keshavarzi in Hamedan Province (34° 46' 23.23" N, 48° 30' 56.3" E, 1931 m a.s.l.), 17 vi 2008, 6 (♀♀) on Yarrow, *Achillea miliofolium* Miller, infested by two spotted spider mites; Heydareh village of Hamedan vicinity in Hamedan Province (34° 48' 11.80" N, 48° 28' 23.04" E, 1840 m a.s.l.), 18 vii 2009, 2 (♀♀) on Feverfew, *Tanacetum parthenium* (L.) Sch. Bip; Sarab Gamasiab of Nahavand vicinity in Hamedan Province (34° 02' 47.22" N, 48° 22' 26.39" E, 1840 m a.s.l.) 20 vii 2008, 1 (♀) on Chicory foliage, *Cichorium intybus* L., infested with Two spotted spider mite, *Tetranychus urticae* Koch: Tetranychidae; Asadabad vicinity

of Hamedan Province 34° 46' 17.33" N, 48° 06' 59.22" E, 1574 m a.s.l.); 10 viii 2008, 2 (♀♀) on Russian knapweed, *Acroptilon repens* (L.); Abbass Abad of Hamedan Province (34° 47' 11.45" N, 48° 27' 57.88" E, 1986 m a.s.l.) 03, 13 ix 2008, 4 (♀♀) on Holy thistle, *Centaurea benedicta* L.

**Previous records from Iran:** Kamali (1990); Sadeghi Namaghi (1995); Khanjani (1996); Kamali *et al.*, 2001; Modarres Awal (2002).

**Tydeidae Kramer, 1877****Tydeus Koch, 1836****Tydeus caryae Khanjani & Ueckermann, 2003a**

**Material examined:** Heydareh village of Hamedan in Hamedan Province (34° 48' 11.80" N, 48° 28' 23.04" E, 1840 m a.s.l.), 24 vii and 3 viii 2009, 3 (♀♀) on Safflower, *Carthamus oxyacantha* M.S.; Ganjnameh region in Hamedan Province (34° 46' 21.26" N, 48° 27' 29.01" E, 2068 m a.s.l.), 28 viii 2009, 1 (♀) on Yarrow, *Achillea miliofolium* Miller, infested by two spotted spider mites; Sarab Gamasiab of Nahavand vicinity in Hamedan Province (34° 02' 49.42" N, 48° 22' 30.81" E, 1828 m a.s.l.), 12 x 2008, 2 (♀♀) on Chicory, *Cichorium intybus* L.

**Previous records from Iran:** Khanjani and Ueckermann 2003a; Khanjani and Mirab Balou, 2007; Izadi *et al.*, 2010.

**Stigmaeidae Oudemans, 1931****Stigmaeus Koch, 1836****Stigmaeus pilatus Kuznetsov, 1978**

**Material examined:** Ganjnameh region of Hamedan Province (34° 45' 41.91" N, 48° 26' 46.92" E, 2130 m a.s.l.), 28 x 2009, 2 (♀♀) on Chicory, *Cichorium intybus* L., infested with two spotted spider mite.

**Previous records from Iran:** Khanjani *et al.*, 2010; Rostami *et al.*, 2010.

**Eupalopsellidae Willmann, 1952****Eupalopsellus Sellnick, 1949****Eupalopsellus ueckermanni Khanjani, Masoudian & Asali Fayaz, 2011**

**Material examined:** Heydareh village of Hamedan vicinity in Hamedan Province (34° 48' 11.80" N, 48° 28' 23.04" E, 1840 m a.s.l.), 09 ix 2009, 3 (♀♀) on Yarrow, *Achillea*

*millefolium* L., infested by two spotted spider mites.

***Eupalopsellus hamedaniensis* Khanjani & Ueckermann, 2007**

**Material examined:** Heydareh village of Hamedan vicinity in Hamedan Province (34° 48' 11.80" N, 48° 28' 23.04" E, 1840 m a.s.l.), 29 ix 2009, 3 (♀♀) on Yarrow, *Achillea millefolium* L., infested by two spotted spider mites.

**Previous records from Iran:** Khanjani *et al.*, 2007; Khanjani *et al.*, 2011.

**Raphignathidae Kramer 1877**

***Raphignathus* Duges 1834**

***Raphignathus hecmataniensis* Khanjani & Ueckermann, 2003b**

**Material examined:** Abbass Abad of Hamedan Province (34° 47' 11.45" N, 48° 27' 57.88" E, 1986 m a.s.l.), 26 viii 2008, 5 (♀♀) on Echinops plant, *Echinops orientalis* Trautv.

**Previous records from Iran:** Khanjani and Ueckermann 2003b; Rostami *et al.*, 2010.

**Cunaxidae Thor, 1902**

***Cunaxa* von Heyden, 1826**

***Cunaxa capreolus* (Berlese, 1889)**

**Material examined:** Shahrestaneh of Toyserkan vicinity in Hamedan Province (34° 41' 58.65" N, 48° 21' 34.94" E, 2076 m a.s.l.), 15 viii 2009, 9 (♀♀) from soil and litter of Chicory, *Cichorium intybus* L.

**Previous records from Iran:** Khanjani (1996); Den Heyer *et al.*, 2011; Haddad Irani- Nejad *et al.*, 2005; Izadi *et al.*, 2010; Rostami *et al.*, 2010.

**Bdellidae Duges, 1834**

***Spinibdella* Thor, 1930**

***Spinibdella cronini* (Baker & Balock, 1962)**

**Material examined:** Abbass Abad of Hamedan Province (34° 47' 11.45" N, 48° 27' 57.88" E, 1986 m a.s.l.), 27 viii 2008, 2 (♀♀) on Echinops plant, *Echinops orientalis* Trautv.

**Previous records from Iran:** Khanjani (1996); Rostami *et al.*, 2010; Changizi *et al.*, 2011.

**Erythraeidae Oudemans, 1902**

***Erythraeus* Latreille, 1806**

***Erythraeus (Zaracarus)* Southcott, 1995**

***Erythraeus (Zaracarus) ueckermanni* Saboori, Nowzari & Bagheri Zenouz, 2004**

**Material examined:** Sarab Ghamasiab, Nahavand vicinity in Hamedan Province (34° 02' 47.22" N, 48° 22' 26.39" E, 1840 m a.s.l.), 01 x 2009, 1 (Larva) on Cornflower, *Centaurea cyanus* L., infested with unknown aphid; Abbass Abad, Hamedan vicinity (34° 47' 11.45" N, 48° 27' 57.88" E, 1986 m a.s.l.), 06 xiii 2008, 1 (Larva) on Chicory foliage, *Cichorium intybus* L. and 1 (Larva) Yarrow, *Achillea millefolium* Miller.

**Previous record from Iran:** Saboori *et al.*, 2004.

***Erythraeus (Erythraeus)* Latreille 1806**

***Erythraeus (Erythraeus) mirabi* Khanjani *et al.*, 2007**

**Material examined:** Ganjnameh region, Hamedan vicinity (34° 45' 41.91" N, 48° 26' 46.92" E, 2130 m a.s.l.), 27, 28 xiii 2009, 2 (Larva) on Chicory, *Cichorium intybus* L.

**Previous record from Iran:** Khanjani *et al.*, 2007.

***Erythraeus (Erythraeus) garmsaricus* Saboori *et al.*, 2004.**

**Material examined:** Ganjnameh region, Hamedan vicinity (34° 46' 21.26" N, 48° 27' 29.01" E, 2068 m a.s.l.), 28 xiii 2009, 1 (Larva) on Chicory, *Cichorium intybus* L.

**Previous records from Iran:** Saboori *et al.*, 2004; Ardeshir *et al.*, 2008.

**Trombidiidae Leach, 1815**

***Allothrombium* Berlese, 1903**

***Allothrombium ovatum* Zhang & Xin, 1992**

**Material examined:** Faculty of Agriculture of Bu-Ali Sina university in Hamedan vicinity (34° 48' 11.30" N, 48° 28' 55.13" E, 1822 m a.s.l.), 13 vii 2009, 3 (Larvae) on Yarrow, *Achillea millefolium* L.

**Previous record from Iran:** Izadi *et al.*, 2010.

**Phytoseiidae Berlese, 1916**

***Neoseiulus* Hughes, 1948**

***Neoseiulus bicaudus* Wainstein, 1962**

**Material examined:** Ganjnameh region of Hamedan vicinity (34° 46' 21.26" N, 48° 27' 29.01" E, 2068 m a.s.l.), 28 viii 2009, 10 (♀♀) on Chicory, *Cichorium intybus* L. infested with Two spotted spider mite.

**Previous record from Iran:** Kamali *et al.*, 2001; Faraji *et al.*, 2007; Hajizadeh *et al.*,

2010b; Rahmani *et al.*, 2010; Haddad Irani-Nejad *et al.*, 2003; Asali Fayaz *et al.*, 2011.

***Typhlodromus* Scheuten, 1857**

***Typhlodromus (Anthoseius) iraniensis* Daneshvar & Denmark, 1982**

**Material examined:** Ganjnameh region of Hamedan vicinity (34° 46' 21.26" N, 48° 27' 29.01" E, 2068 m a.s.l.), 28 viii 2009, 10 (♀♀) on Chicory, *Cichorium intybus* L. infested with two spotted spider mite.

**Previous records from Iran:** Daneshvar and Denmark 1982, Faraji *et al.*, 2007; Hajizadeh *et al.*, 2010b; Asali Fayaz *et al.*, 2011.

**Ascidae Voigts & Oudemans, 1905**

***Lasioseius* Berlese, 1916**

***Lasioseius youcefi* Athias-Henriot, 1959**

**Material examined:** Sarab Gamasiab of Nahavand vicinity in Hamedan Province (34° 02' 49.42" N, 48° 22' 30.81" E, 1828 m a.s.l.), 17 i 2010, 5 (♀♀) from soil and litter of Russian knapweed, *Acroptilon repens* (L.).

**Previous records from Iran:** Khanjani (1996); Kamali *et al.*, 2001; Khanjani and Mirab Balou (2006); Hajizadeh *et al.*, 2010a; Kazemi and Rajaei (2013).

**Veigaiidae Oudemans, 1939**

***Veigaia* Farrier 1957**

***Veigaia nemorensis* (Koch), 1839**

**Material examined:** Sarab Gamasiab of Nahavand vicinity in Hamedan Province (34° 02' 49.42" N, 48° 22' 30.81" E, 1828 m a.s.l.), 17 i 2010, 2 (♀♀) from soil and litter of Chicory, *Cichorium intybus* L.; Ganjnameh region of Hamedan vicinity (34° 46' 21.26" N, 48° 27' 29.01" E, 2068 m a.s.l.), 13 i 2010, 3 (♀♀) from soil and litter of Chicory, *Cichorium intybus* L.

**Previous records from Iran:** Khanjani (1996); Rostami *et al.*, 2010; Kazemi and Rajaei (2013).

**Eviphididae Berlese, 1913**

***Alliphis* Halbert, 1923**

***Alliphis halleri* (G. & R. Canestrini, 1884)**

**Material examined:** Sarab Gamasiab of Nahavand vicinity in Hamedan Province (34° 02' 49.42" N, 48° 22' 30.81" E, 1828 m a.s.l.), 28 xii 2009, 3 (♀♀) from soil and litter of Chicory, *Cichorium intybus* L.

**Previous records from Iran:** Khanjani (1996); Kazemi (2010); Kazemi and Rajaei (2013).

**Discussion**

According to this study a few species were phytophagous but most species were effective agents in natural equilibrium to the extent that in their presence there would be no need for chemical control. Among the plant feeder mites two spotted spider mite, *T. urticae* was most widely distributed with high populations in certain locations. No considerable damage was noticed on the host plants because the predatory mites are effective in reduction of its population. There is a great diversity of predatory mites on the medicinal plants yet the Phytoseiidae family members play the major role (Masoudian, 2011) as good potential biological control agents.

**Acknowledgements**

We thank Prof. Edward A. Ueckermann (ARC-Plant Protection Research Institute, Private Bag X134, Queenswood, Pretoria, 0121 South Africa) for critical review of the manuscript and supplying some literature review, and his valuable comments.

**References**

- Ardeshir, F., Yousefi Porshokouh, A. and Saboori, A. 2008. A faunistic study and population fluctuations of mites associated with stored wheat in Tehran region, Iran. *Journal of Entomological Society of Iran*, 27 (2): 17-28
- Asali Fayaz, B., Khanjani, M., Molavi, F. and Ueckermann, E. A. 2011. Phytoseiid mites (Acari: Phytoseiidae) of apple and almond trees in regions of western and south-western Iran. *Acarologia*, 51 (3): 371-379.
- Changizi, M., Bagheri, M. and Asadi, M. 2011. Fauna of Bdelloidea and Raphignathoidea (Acari: Trombidiformes) in Kerman, Iran. *First Persian Congress of Acarology*, p. 14.

- Daneshvar, H. 1974. Fauna of plant mites in Azerbaijan. *Applied Entomology and Phytopathology*, 28: 29-45.
- Daneshvar, H. and Denmark H. A. 1982. Phytoseiids of Iran (Acarina: Phytoseiidae). *International Journal of Acarology*, 8 (1): 3-14.
- Davachi, A. and Taghizadeh, F. 1955. Citrus pests of Iran. *Applied Entomology and Phytopathology*, 14: 1-80.
- Den Heyer, J., Ueckermann, E. and Khanjani, M. 2011. Iranian Cunaxidae (Acari: Prostigmata: Bdelloidea): Part 2. Subfamily Cunaxinae. *Journal of Natural History*, 45 (27-28): 1667-1678.
- Farahbakhsh, Gh. 1961. Checklist of important insects and other enemies of plants and Agricultural Products in Iran. Department of Plant Protection, Tehran, 1: 153 pp.
- Faraji, F., Hajizadeh, J., Ueckermann, E. A., Kamali, K. and McMurtry, J. A. 2007. Two new records for Iranian phytoseiid mites with synonymy and keys to the species of *Typhloseiulus* Chant and McMurtry and Phytoseiidae in Iran (Acari: Mesostigmata). *International Journal of Acarology*, 33 (3): 231-239.
- Gupta, S.K. and Karmakar, K. 2010. Diversity, bio-ecology and management of mites infesting medicinal & aromatic plants in India. Abstract Book of 13th International Congress of Acarology, Recife-PE, Brazil, p. 101.
- Haddad Irani-Nejad, K., Hajiganbar, H. and Talebi Chaichi, P. 2003. Introduction of some mesostigmatic mites of sugarbeet fields in Miandoab plain. *Journal of Agricultural Sciences and Natural Resources*, 10 (2): 147-157.
- Haddad Irani-Nejad, K., Hajiganbar, H. R. and Talebi Chaichi, P. 2005. An introduction of the prostigmatic mites in sugarbeet fields in Miandoab Plain. *Iranian Journal of Agricultural Science*, 36 (1): 247-262.
- Hajizadeh, J., Fraji, F. and Rafati Fard, M. 2010a. Ascidae (Acari: Mesostigmata) of Guilan Province, a new genus and four species records for the Iranian mite fauna and a key to the North of Iran ascid species. *Iranian Journal of Plant Protection Science*, 40 (2): 35-50.
- Hajizadeh, J., Faraji, F. and Rafati Fard, M. 2010b. Pradatory mites of the Phytoseiidae family of Iran. Guilan University Press. 282 pp.
- Izadi, H., Asadabadi, A., Khanjani, M. and Payandeh, A. 2010. Some predatory mites associated with pomegranate, palm and citrus from southeast of Iran. Abstract Book of 13th International Congress of Acarology, Recife-PE, Brazil, p. 112-113.
- Kalvandi, R., Safikhani, K. Najafi, G.H. and Babakhanlo, P. 2007. Medicinal Plants of Hamadan province. *Iranian Journal of Medicinal and Aromatic Plants*, 23 (3): 350-374.
- Kamali, K. 1990. A checklist of plant mites (Acari) of Khuzestan, south-western Iran. *Scientific Journal of Agriculture*, 13 (13): 73-83.
- Kamali, K., Ostovan, H. and Atamehr, A. 2001. A catalog of mites and ticks (Acari) of Iran. Islamic Azad University Scientific Publication Center, 198 pp.
- Kazemi, S. 2010. The first record of *Alliphis halleri* (Acari: Mesostigmata: Eviphididae) from Iran. Abstract Book of 13th International Congress of Acarology, Recife-PE, Brazil, p. 120.
- Kazemi, S. and Rajaei, A. 2013. An annotated checklist of Iranian Mesostigmata (Acari), excluding the family Phytoseiidae. *Persian Journal of Acarology*, 2 (1), 63-158.
- Khalil-Manesh, B. 1973. Phytophagous mite fauna of Iran (I). *Applied Entomology and Phytopathology*, 35: 30-38.
- Khanjani, M. 1996. Mite (Acari) associated with Fabaceae plants in Hamedan province and functional response of *Anystis baccarum* (L.) and *Erythraeus* sp. to developmental stage of *Tetranychus turkestanii* (U. & N.), Ph. D. dissertation. Tarbiat Modares University, Tehran. 431 pp.
- Khanjani, M. and Kamali, K. 1993. Mites (Acari: Actinedida) associated with Fabaceae plants in Hamadan. Abstract Book

- of 11th Iranian Plant Protection Congress, Rasht, Iran, p. 272.
- Khanjani, M. and Kamali, K. 2000. Mites (Acari) associated with beans (*Phaseolus vulgaris*) in Hamadan province. Abstract Book of 14th Iranian Plant Protection Congress, Isfahan, Iran, p. 246.
- Khanjani M. and Ueckermann, E. A. 2003a. Four new tydeid species from Iran (Acari: Prostigmata). *Zootaxa*, 182: 1-11.
- Khanjani, M. and Ueckermann E. 2003b. Two new species of the genus *Raphignathus* Duges (Acari: Raphignathidae) from Iran. *Acarologia*, 1: 299-306.
- Khanjani, M. and Haddad Irani-Nejad, K. 2006. Injurious mites of agricultural crops in Iran. Bu-Ali Sina University of Hamadan Press. 515 pp.
- Khanjani, M. and Mirab Balou, M. 2006. Study on Acari fauna of citrus orchards in southern Iran. *Integrated Control in Citrus Fruit Crops IOBC WPRS Bulletin*. 29 (3): 293.
- Khanjani, M. and Mirab Balou, M. 2007. Study on eriophyoid mites of walnut trees and their natural enemies in west of Iran. *Iranian Journal of Biology*, 19 (4): 464-475.
- Khanjani, M., Eghbalian, A. H. and Ueckermann, E. A. 2007. A new species of the genus *Eupalopsellus* Sellnick (Acari: Prostigmata, Eupalopsellidae) from West of Iran. *International Journal of Acarology*, 33 (4): 319-322.
- Khanjani, M., Ueckermann, E. A. and Hasan, M. U., 2007. A new species of the genus *Erythraeus* (Acari: Erythraeidae) from Iran. *Journal of Pakistan Entomology*, 29 (2): 51-56.
- Khanjani, M., Gotoh, T. and Kitashima, Y. 2008. A new species of the genus *Bryobia* Koch (Acari: Tetranychidae) from Iran. *International Journal of Acarology*, 34 (3): 243-249.
- Khanjani, M., Izadi, H., Asali Fayaz, B., Raisi, H., Rostami, E. and Doğan, S. 2010. *Stigmaeus boshroyehensis* sp. nov. (Acari: Stigmaeidae) from eastern Iran, with re-description of *Stigmaeus pilatus* Kuznetsov. *Zootaxa*, 2727: 34-44.
- Khanjani, M., Masooudian, F. and Asali Fayaz, B. 2011. A new species of the genus *Eupalopsellus* Sellnick: Acari: Prostigmata, Eupalopsellidae) from West of Iran. *International Journal of Acarology*, 37 (1): 102-107.
- Khanjani, M., Rostami E., Abbasipour, H. and Ueckermann, E. A. 2011. Description of male and immature stages of *Eupalopsellus hamedaniensis* Khanjani *et al.*, (Acari: Eupalopsellidae). *International Journal of Acarology*, 37 (5): 391-404.
- Masoudian, F. 2011. Identification of mite fauna associated with some of the medicinal plants (Asteraceae Family) in Hamedan area. Bu-Ali Sina University, College of Agriculture, Department of Plant protection, MSc thesis, 104 p.
- Mehrnejad, M. R. and Ueckermann, E. A. 2001. Mites (Arthropoda, Acari) associated with pistachio trees (Anacardiaceae) in Iran (I). *Systematic & Applied Acarology*, 6: 1-12.
- Modarres Awal, M. 2002. List of agricultural pests and their natural enemies in Iran. 3rd. Ed., Univ. Ferdowsi, Mashhad. 429 pp.
- Rahmani, H., Kamali, K. and Faraji, F. 2010. Predatory mite fauna of Phytoseiidae of northwest Iran (Acari: Mesostigmata). *Turkish Journal of Zoology*, 34: 497-508.
- Rostami, E., Abbasipour, H., Khanjani, M. and Askarianzadeh, A. 2010. Faunistic study of fruit tree mites in Hamedan Province, west of Iran. Abstract Book of 13th International Congress of Acarology, Recife-PE, Brazil, p. 233.
- Saboori, A., Godarazena, A. and Khajeali, J. 2004a. Two new species of larval *Erythraeus* (Acari: Erythraeidae) from Iran with remarks on differential diagnoses. *Systematic & Applied Acarology*, 9: 163-178.
- Saboori, A., Nowzari, J. and Bagheri Zenouz, E. (2004 b) A new species of larval *Erythraeus* (Acari: Erythraeidae) from Iran. *Glasnik Republickog Zavoda za Zaštitu Prirode, Podgorica*, 27-28, 78-84.
- Sadeghi Namaghi, H. 1995. Survey of mites (Acari) fauna of pomaceous fruit trees in



- Mashhad region. Journal of Agricultural Science and Technology, 9 (1): 110-120.
- Sadeghi Namaghi, H. 2010. Mites (Acari: Prostigmata & Mesostigmata) inhabiting green plantings in urban environment of north-eastern Iran, including six new records. Munis Entomology & Zoology, 5 (1): 123-130.
- Sadeghi Namaghi, H. and Kamali, K. 1993. Mites (Acari) associated with sugercane and cereals in Khuzestan. Iran. Scientific Journal of Agriculture University Ahwaz. 16 (1, 2): 69-79.
- Sepasgozarian, H. 1977. The twenty years of Researches in Acarology in Iran. Journal of Iranian Society of Engineers, 56: 40-50.
- Sharma, A. and Agarwal, V. K. 2010. *Tetranychus urticae* Koch a new threat to medicinal plants in India". Abstract Book of 13th International Congress of Acarology, Recife-PE, Brazil, p. 245-246.

## تنوع کنه‌های مرتبط با برخی از گیاهان دارویی (Asteraceae) در همدان

فرشاد مسعودیان و محمد خانجانی

گروه گیاه‌پزشکی، دانشکده کشاورزی، دانشگاه بوعلی سینا، همدان، ایران.

\* پست الکترونیکی نویسنده مسئول مکاتبه: mkhanjani@gmail.com

دریافت: ۲۸ بهمن ۱۳۹۱؛ پذیرش: ۲۸ فروردین ۱۳۹۲

**چکیده:** گیاهان دارویی از دیرباز تاکنون همواره مورد استفاده قرار می‌گیرند. روی این گروه از گیاهان، بندپایانی همچون کنه‌ها یافت می‌شود. در این مطالعه، فون کنه‌های مرتبط با برخی از گیاهان دارویی (خانواده Asteraceae) در منطقه همدان در طول دوره سال‌های ۲۰۰۸ الی ۲۰۰۹ مورد بررسی قرار گرفت. طی آن ۲۳ گونه (۱۸ جنس از ۱۵ خانواده) از کنه‌ها (زیرراسته پیش‌استیگمایان و راسته میان-استیگمایان) جمع‌آوری و شناسایی شد. در این مطالعه، کنه تارتن دولکه‌ای (*Tetranychus urticae* Koch) به‌عنوان کنه گیاهخوار به میزان بیشتری جمع‌آوری شد.

**واژگان کلیدی:** فون، کنه، گیاهخوار، شکارگر، گیاهان دارویی