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Phytoseiid mites (Acari: Mesostigmata: Phytoseiidae) in some regions of western and north western Iran

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Abstract: Study of phytoseiid mites in some regions of western and north–western Iran were carried out during 2008–2011. In this study, 21 species belonging to the six genera were collected and identified. They were associated with aerial parts, soil and litter under cultivated, uncultivated plants and some phytophagous mites and insects.

Keywords: mite, predator, phytophage, fauna, Iran

Introduction

The members of phytoseiid mites are well known predatory mites in the subclass Acari and already some of them are introduced as biological control agents of some phytophagous mites e. g. two spotted spider mites, eriophyid mites and small insect pests such as thrips and whiteflies (Muma, 1971; Meyerdirk and Coudriet, 1986; Sabelis, 1996; Gerson *et al*., 2003; Nomikou *et al*., 2003; Asali Fayaz *et al*., 2011a). The family Phytoseiidae has worldwide distribution and its members are found from the all seven biogeographic regions: Nearctic, Neotropical, Ethiopian, West Palearctic, East Palearctic, Oriental and Australian (Tixier *et al*., 2008). More than 2280 species were reported (Chant and McMurtry, 2007) and only 75 species were recorded from Iran (Faraji *et al*., 2007, 2008; Ueckermann *et al*., 2009; Jafari *et al*., 2011; Shirdel *et al*., 2008, 2009, Hajizadeh *et al*., 2002, 2010; Daneshvar and Denmark, 1982; Daneshvar, 1980, 1987; Khalil–Manesh, 1973; McMurtry, 1977). In this study, 21 species were collected and identified from some regions of western and northwestern Iran.

Material and Methods

This study was carried out in order to collecting and identifying phytoseiid mites in some regions of western and north–western Iran (Hamedan, Kurdistan, Kermanshah and Ardebil provinces) during 2008–2011. The collected samples were transferred to Acarology laboratory for processing. The mites of the foliage samples were obtained by shaking method and Berlese funnel was used to extract the litters and soil specimens. All specimens were directly mounted on microscopic slides using Hoyer's medium (Walter and Krantz, 2009). All specimens were collected by B. Asali Fayaz. The slides were examined under a Nomarski Olympus BX51 microscope. The classification systems used follows that of Chant and McMurtry (2007) and Denmark (1992). List of hosts, localities and map of distribution of the collected specimens are indicated in Table 1 and Figure 1, respectively. The base of map (Fig. 1) is modified from Google earth software (© 2011 Europe Technologies). All specimens are deposited in the Collection of the Acarology Laboratory, University of Bu–Ali Sina, Hamedan, Iran.

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Table 1 Localities status of collected specimens in this study.

Locality	Province	Geographical status	a.s.l. (m)
Fandoghlou forest	Ardabil	38° 23' N, 48° 32' E	1360
Heyran defile	//	38° 26' N, 48° 35' E	1474
Amzajerd greenhouses complex	Hamedan	35° 00' N, 48° 34' E	1669
Asad Abad vicinity	//	34° 46' N, 48° 06' E	1566
Bahar vicinity	//	34° 55' N, 48° 27' E	1709
Faculty of Agriculture, Bu–Ali Sina University	//	34° 48' N, 48° 29' E	1810
Ganjnameh region (Hamedan vicinity)	//	34° 45' N, 48° 26' E	2147
Ghorveh Dar Jazin region (Razan vicinity)	//	35° 21' N, 49° 06' E	1810
Haji Abad village (Famenin vicinity)	//	35° 05' N, 48° 57' E	1624
Hamedan vicinity	//	34° 45' N, 48° 31' E	2015
Heydareh Ghazi Khan village (Bahar vicinity)	//	34° 52' N, 48° 19' E	1874
Heydareh village (Hamedan vicinity)	//	34° 48' N, 48° 28' E	1830
Joraghan village (Hamedan vicinity)	//	34° 54' N, 48° 32' E	1715
Kabodarahangh	//	35° 13' N, 48° 45' E	1663
Malham Abad village (Asad Abad vicinity)	//	34° 49' N, 48° 08' E	1822
Maryanaj vicinity	//	34° 49' N, 48° 24' E	1994
Saleh Abad in (Bahar vicinity)	//	34° 55' N, 48° 19' E	1767
Sarabe Gamasiab (Nahavand vicinity)	//	34° 02' N, 48° 22' E	1822
Shahrestaneh region (Toyserkan vicinity)	//	34° 41' N, 48° 21' E	2075
Sanghestan village (Hamedan vicinity)	//	34° 47' N, 48° 35' E	1858
Yekn Abad village (Bahar vicinity)	//	34° 51' N, 48° 27' E	1740
Dalaho vicinity	Kermanshah	34° 33' N, 45° 58' E	1570
Rijab region	//	34° 28' N, 45° 59' E	950
Sahneh vicinity	//	34° 28' N, 47° 41' E	1345
25 Km Sanandaj–Kamyaran	Kurdistan	35° 05' N, 46° 55' E	1309
30 Km Sanandaj–Kamyaran	//	35° 05' N, 46° 42' E	1309
Km 40 Sanandaj–Marivan	//	35° 24' N, 46° 53' E	1705
Baneh vicinity	//	36° 11' N, 46° 13' E	1498
Chenu region (Sanandaj vicinity)	//	35° 08' N, 46° 57' E	1328
Divandareh vicinity	//	35° 54' N, 47° 01' E	1821
Kamyaran vicinity	//	34° 51' N, 46° 56' E	1628
Karvandan village (Dehgolan vicinity)	//	35° 18' N, 47° 22' E	1813
Marivan	//	35° 26' N, 46° 13' E	1320
Naran region (Sanandaj vicinity)	//	35° 00' N, 46° 58' E	1404
Sannadaj vicinity	//	35° 05' N, 46° 45' E	1309
Sarv Abad of (Marivan vicinity)	//	35° 27' N, 46° 13' E	1284

Results

Subfamily Amblyseiinae Muma
Tribe Amblyseiini Muma
Subtribe Amblyseiina
Genus Amblyseius Berlese, 1914
***Amblyseius obtusus* (Koch, 1839)**
***Zercon obtusus* Koch, 1839**

World distribution: Armenia, Azerbaijan, Canada, Czech Republic, England, France, Germany (First time from Germany? in gardens, meadows and bank of stream and pool), Greece, Hungary, Italy, Moldova, Morocco, New Zealand, Norway, Poland, Russia, Spain, Sweden, Turkey, Ukraine, USA, Venezuela (Moraes *et al*., 2004), Iran (Faraji *et al*., 2007) and new record for the collected regions of this survey.
Regional distribution: Australian, Holarctic.
Material examined: Sarabe Gamasiab, 24 ix 2009, 2 (♀♀), soil and litter of alfalfa; Marivan, 19 xi 2009, 1 (♀), soil and litter of apple.

***Amblyseius rademacheri* (Dosse, 1958)**
Typhlodromips rademacheri Dosse, 1958: 44.
World distribution: Armenia, Azerbaijan, China, Denmark, Georgia, Germany (First time, on apple), Hungary, Iran, Italy, Japan, Moldova, Netherlands, Russia, Slovakia, South Korea, Switzerland, Ukraine (Moraes *et al*., 2004) and new record for the collected region of this survey.
Regional distribution: Palearctic, Oriental.
Material examined: Heyran defile, 29 ix 2008, 1 (♀), aerial part of Lady Fern bushes, *Athyrium filix–femina* (L.) Roth (Dryopteridaceae).

Subtribe Proprioseiopsina Chant & McMurtry
***Genus Proprioseiopsis* Muma, 1961**
***Proprioseiopsis messor* (Wainstein, 1960)**
Typhlodromus messor Wainstein, 1960: 688.
World distribution: Algeria, Armenia, Australia, Azerbaijan, France, Gaza Strip, Georgia (First time, on grass), Germany, Greece, Israel, Italy, Morocco, New Zealand, South Africa, Spain, Turkmenistan, Ukraine (Moraes *et al*., 2004), Iran (Faraji *et al*., 2007; Nourbakhsh and Kamali, 1995) and new record for the collected region.

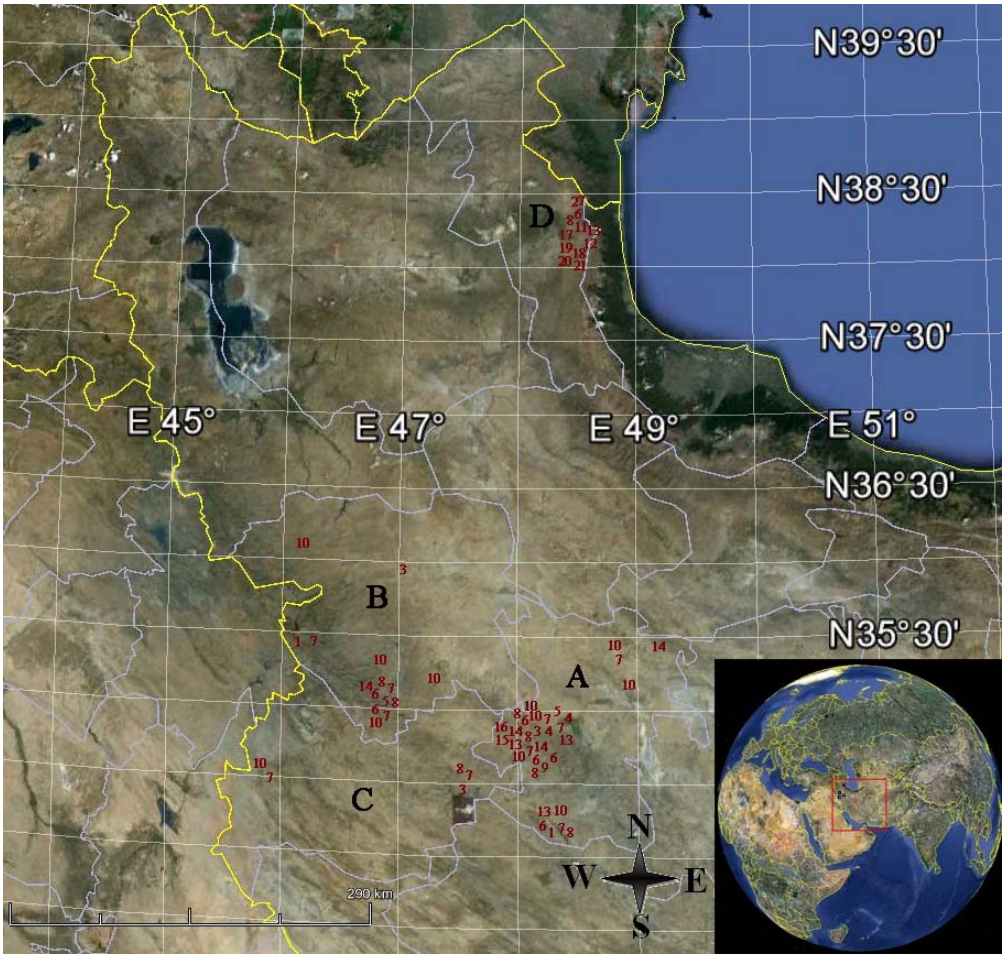

Figure 1 Geographic distribution of phytoseiid species in some regions of western and north westren Iran (Google earth © 2011 Europe Technologies).
A. Hamedan province
B. Kurdistan province
C. Kermanshah province
D. Ardebil province

List of species mentioned at Fig. 1.

N.	Species	N.	Species
1	*Amblyseius obtusus*	**12**	*Phytoseius ciliatus*
2	*Amblyseius rademacheri*	**13**	*Phytoseius plumifer*
3	*Proprioseiopsis messor*	**14**	*Typhlodromus* (*Anthoseius*) *bagdasarjani*
4	*Neoseiulus agrestis*	**15**	*Typhlodromus* (*Anthoseius*) *khosrovensis*
5	*Neoseiulus barkeri*	**16**	*Typhlodromus* (*Anthoseius*) *rodriguezi*
6	*Neoseiulus bicaudus*	**17**	*Typhlodromus* (*Anthoseius*) *rhenanus*
7	*Neoseiulus marginatus*	**18**	*Typhlodromus* (*Anthoseius*) *tamaricis*
8	*Neoseiulus sugonjaevi*	**19**	*Typhlodromus* (*Typhlodromus*) *athiasae*
9	*Neoseiulus tauricus*	**20**	*Typhlodromus* (*Typhlodromus*) *leptodactylus*
10	*Neoseiulus zwoelferi*	**21**	*Typhlodromus* (*Typhlodromus*) *tubifer*
11	*Paragigagnathus insuetus*		

Regional distribution: Afrotropical, Australian, Palearctic.
Material examined: Yekn Abad village, 28 v 2010, 1 (♀), aerial part of wall barley, *Hordeum murinum* L. (Poaceae); Divandareh vicinity, 18 v 2011, aerial part of Betony, *Stachys lavandifolia* Vahl (Lamiaceae); Sahneh vicinity, 15 xi 2009, 1 (♀), aerial part of grape, *Vitis vinifera* L. (Vitaceae).

Tribe Neoseiulini Chant & McMurtry, 2003
Genus *Neoseiulus* Huges, 1948: 141
***Neoseiulus agrestis* (Karg, 1960)**
Typhlodromus agrestis Karg, 1960: 449.
World distribution: Czech Republic, France, Germany (First time, in soil), Hungary, Kazakhstan, Moldova, Netherlands, Russia, Spain, Switzerland, Turkey, Ukraine, USA (Moraes *et al*., 2004), Iran (Faraji *et al*., 2007) and new record for the collected regions of this survey.
Regional distribution: Holarctic
Material examined: Maryanaj vicinity, 22 v 2010, 2 (♀♀), bark of apple tree; Bahar vicinity, 15 vii 2010, 1 (♀), tubers of potato, *Solanum tuberosum* L. (Solanaceae), infested by golden nematode, *Globodera rostochiensis* (Wollenweber) (Heteroderidae).

***Neoseiulus barkeri* Hughes, 1948**
World distribution: Algeria, Australia, Brazil, Canary Islands, Cape Verde, China, England (First time, on germinating barley), Finland, France, Georgia, Germany, Ghana, Greece, Guinea, Israel, Italy, Japan, Jordan, Netherlands, Nigeria, Norway, Reunion Island, Russia, South Africa, South Korea, Spain, Sweden, Turkey, Ukraine, West Bank, Yemen (Moraes *et al*., 2004), Iran (Faraji *et al*., 2007) and new record for the collected regions of this survey.
Regional distribution: Afrotropical, Australian, Neotropical, Oriental, Palearctic.
Material examined: Amzajerd greenhouses complex, 22 v 2010, 1 (♀), aerial part of cucumber shrub, *Cucumis sativus* L. (Cucurbitaceae); 30 Km Sanandaj–Kamyaran, 06 xi 2009, 1 (♀), aerial part of strawberry.

***Neoseiulus bicaudus* (Wainstein, 1962)**
Amblyseius bicaudus Wainstein, 1962: 146.
World Distribution: Armenia, Azerbaijan, Caucasus Region, France, Georgia, Greece, Hungary, Israel, Italy, Kazakhstan (First time on grass), Moldova, Norway, Russia, Spain, Switzerland, Tajikistan, Turkey, Ukraine, USA (Moraes *et al*., 2004), Japan (Ehara and Amano, 2004), Iran (Asali Fayaz *et al*., 2011a,,b; Faraji *et al*., 2007) and new record for the collected regions of this survey.
Regional distribution: Neotropical, Palearctic.
Material examined: Ganjnameh region, 28 x 2009, 10 (♀♀) and 2 (♂♂), aerial part of Chicory, *Cichorium intybus* L. (Asteraceae), infested by two spotted spider mite (TSSM), *Tetranychus urticae* Koch (Tetranychidae); Heydareh village 16 viii 2010, 2 (♀♀), aerial part of Bermuda grass, *Cynodon dactylon* (L.) Pers. (Poaceae); Saleh Abad, 03,12 xi 2009, 3 (♀♀), soil and litter of Willow, *Salix alba* L. (Salicaceae), and 12 xi 2009, 2 (♀♀), soil and litter of gum bushes, *Astragalus verus* Olivier: Fabaceae; Sarabe Gamasiab, 17 i 2010, 1 (♀), soil and litter of Bermuda grass, *Cynodon dactylon* (L.) Pers. (Poaceae); and 1 (♀), aerial part of *Rosa persica* J. F. Gmel. (Rosaceae); Faculty of Agriculture, Bu–Ali Sina University, 21 v 2010, 1 (♀), aerial part of Yarrow, *Achillea millefolium* L. (Asteraceae), infested by TSSM; 25 Km Sanandaj–Kamyaran, 6 xi 2009, 1 (♀), soil and litter of strawberry shrubs; Naran region **Sanandaj vicinity** 13 xi 2009, 3 (♀♀), soil and litter of raspberry bushes, *Rubus hyrcanus* Juz. (Rosaceae); Fandoghlou forest, 31 vi 2010, 3 (♀♀), soil and litter of Hazelnut trees, *Corylus avellanae* L.

***Neoseiulus marginatus* (Wainstein, 1961)**
Typhlodromus marginatus Wainstein, 1961: 158.
World distribution: Algeria, Armenia, Azerbaijan, France, Georgia, Greece, Hungary, Kazakhstan (First time on herb), Kenya, Moldova, Russia, Turkmenistan, Ukraine (Moraes *et al.,* 2004) Iran (Faraji *et al*., 2007; Hajizadeh, 2007; Nourbakhsh and Kamali, 1995) and new record for the collected regions of this survey.

Regional distribution: Palearctic

Material examined: Faculty of Agriculture, Bu–Ali–Sina University, 14 vi 2009, 1 (♀), aerial part of white Marshmallow, *Althaea officinalis* L.: Malvaceae, infested by TSSM and 1 (♀), aerial part of yellow melilot, *Melilotus officinalis* (L.) Pall. (Fabaceae), and 15 v 2009, 2 (♀♀), aerial part of Hairy vetch, *Vicia villosa* Roth (Fabaceae), infested by TSSM and 1 (♀), aerial part of Italian bugloss, *Echium italicum* L. (Boraginaceae) infested by TSSM and 21 iv 2010, 1 (♀), aerial part of sickle weed, *Falcaria sioides* (Wibel) Aschers (Apiaceae); *Heydareh village*, 10 ix 2010, 1 (♀), soil and litter of walnut, *Juglans regia* L. (Juglandaceae), and 11 xi 2009 and 10 ix 2010, 4 (♀♀), soil and litter of peach tree, *Prunus persica* (L.) Batsch (Rosaceae), and 16 xi 2009, 5 (♀♀), soil and litter of apple trees; Joraghan village, 16 iii 2010, 1 (♀), soil and litter of alfalfa; Sanghestan village, 26 iv 2010, 1 (♀), aerial part of Broad leaf plantain, *Plantago major* L. (Plantaginaceae); Kabodarahangh vicinity, 14 xii 2010, 1 (♀), aerial part of Russian olive, *Elaeagnus angustifolia* L. (Elaeagnaceae); Sarabe Gamasiab, 28 ix 2009 and 17 x 2009, 2 (♀♀), aerial part of Syrian mesquite, *Prosopis stephaniana* (M. Bieb.) (Fabaceae), and 1 (♀), soil and litter under apple tree; Kamyaran vicinity, 06 xi 2010, 1 (♀), soil and litter of peach trees, *Prunus persica* (L.) Batsch (Rosaceae); Sarv Abad, 20 v 2009, 1 (♀), soil and litter of apple tree; Kamyaran vicinity, 21 vi 2009, 1 (♀), aerial part of Horse Mint, *Mentha longifolia* (L.) Huds. (Lamiaceae); Sannadaj vicinity, 18 xi 2009, 1 (♀), soil and litter of apricot trees, *Prunus armenica* L. (Rosaceae); Naran village, 18 xi 2009, 1 (♀), aerial part of Field Bindweed bushes, *Convolvulus arvensis* L. (Convolvulaceae); Sahneh vicinity, 20 xi 2009, 1 (♀), soil and litter of alfalfa; Rijab region 16 iv 2010, 1 (♀), aerial part of Common mallow, *Malva neglecta* Wallr. (Malvaceae); Heyran defile, 09x 2008, 1 (♀), aerial part of Lady Fern bushes, *Athyrium filix–femina* (L.) Roth (Dryopteridaceae).

***Neoseiulus sugonjaevi* (Wainstein & Abbasova, 1974)**

Amblyseius sugonjaevi Wainstein & Abbasova, 1974: 796.

World distribution: Azerbaijan (First time in rodent nest), Uzbekistan (Moraes *et al*., 2004), Iran (Faraji *et al*., 2007) and new record for the collected regions.

Regional distribution: Palearctic.

Material examined: Sarabe Gamasiab, 23 ix 2009, 1 (♀), soil and litter under wild almond, *Amygdalus scoparia* Spach. (Rosaceae); Asad Abad vicinity, 10 x 2009, 1 (♀), aerial part of alfalfa; Shahrestaneh region, 12 x 2009, 1 (♀), aerial part of walnut trees, *Juglans regia* L. (Juglandaceae); Saleh Abad vicinity, 11 xi 2009, 1 (♀), aerial part of gum. Sanandaj vicinity, 08 x 2009, 1 (♀), aerial part of onion, *Allium cepa* L. (Amaryllidaceae) and 08 x 2009 and 06 xi 2009, 6 (♀♀), soil and litter of tomato, *Lycopersicum esculentum* Miller (Solanaceae), and 05 xi 2009, 1 (♀), soil and litter under Sweet cherry tree, *Prunus avium* L. (Rosaceae), and 2 (♀♀), soil and litter of Plum trees, *Prunus cerasifera* Ehrh. (Rosaceae); Naran region, 07 xi 2009, 2 (♀♀), aerial part, soil and litter of alfalfa, *Medicago sativa* L. (Fabaceae), and 11 xi 2009, 1 (♀), soil and litter of apple trees; Chenu region, 11 xi 2009, 12 (♀♀), aerial part and apple fruits under trees and also 3 (♀♀), soil and litter of tomato. Sahneh vicinity, 07 viii 2009 and 09 xi 2009, 4 (♀♀), aerial part of alfalfa. Heyran region, 27 ix 2008, 1 (♀) and aerial part of Lady Fern bushes, *Athyrium filix–femina* (L.) Roth (Dryopteridaceae).

***Neoseiulus tauricus* (Livshitz & Kuznetsov, 1972)**

Amblyseius tauricus Livshitz & Kuznetsov, 1972: 24.

World distribution: Armenia, Azerbaijan, China, France, Greece, Ukraine (First time on unspecified substrate) (Moraes *et al*., 2004), Iran (Faraji *et al*., 2007) and new record for the collected region of this survey.

Regional distribution: Palearctic.

Material examined: Faculty of Agriculture, Bu–Ali–Sina University, 21 ix 2011, 2 (♀♀) and aerial part of Yarrow, *Achillea millefolium* L. (Asteraceae).

***Neoseiulus zwoelferi* (Dosse, 1957)**
Typhlodromus zwoelferi Dosse, 1957: 301.
World distribution: Azerbaijan, Finland, Germany (First time on apple), Iran, Israel, Kazakhstan, Montenegro, Norway, Russia, Sweden, Switzerland, Turkey, Ukraine, USA (Moraes *et al*., 2004), Greece (Papadoulis *et al*., 2009) and new record for the collected regions of this survey.
Regional distribution: Palearctic
Material examined: Kabodarahangh vicinity, 24 iv 2010, 2 (♀♀), aerial part of alfalfa, *Medicago sativa* L. (Fabaceae), and 20 iii 2010, 1 (♀), soil and litter of alfalfa, 3 (♀♀) soil and litter of Woodland sage plants, *Salvia nemorosa* L. (Lamiaceae); Joraghan village, 08 viii 2009, 2 (♀♀), soil and litter of alfalfa; Heydareh village, 17 ix 2009, 1 (♀), soil and litter of walnut trees, *Juglans regia* L. (Juglandaceae), and 12 xi 2009, 2 (♀♀), soil and litter of apple; Sarabe Gamasiab region, 28 ix 2009, 11 (♀♀) soil and litter of Plane tree, *Platanus orientalis* L. (Platanaceae), and 18 i 2010, 2 (♀♀), soil and litter under Plane tree, *Platanus orientalis* L. (Platanaceae), and 1 (♀), soil and litter under gum bushes, *Astragalus verus* Olivier (Fabaceae); Campus of agricultural faculty, 21 iv 2010, 1 (♀), aerial part of Corn Buttercup plants, *Ranunculus arvensis* L. (Ranunculaceae); Sanghestan village, 26 iv 2010, 4 (♀♀), aerial part of Red clover, *Trifolium pretense* L. (Fabaceae) and 4 (♀♀), aerial part of Yarrow, *Achillea millefolium* L. (Asteraceae); Yekn Abad village, 05 iv 2010, 1 (♀), aerial part of Wall barley, *Hordeum murinum* L. (Poaceae); Hamedan vicinity, 15 viii 2010, 2 (♀♀), soil under gum bushes, *Astragalus verus* Olivier (Fabaceae); Haji Abad village, 2 (♀♀) aerial part of alfalfa; Heydareh Ghazi Khan village, 3 (♀♀), unknown host (soil); Baneh vicinity, 15 v 2010, 3 (♀♀), soil and litter of Sweet cherry tree, *Prunus avium* L. (Rosaceae); Veinesar region of Ghorveh vicinity, 09 viii 2009, 2 (♀♀) aerial part of alfalfa; Sanandaj vicinity, 09 viii 2009, 1 (♀), aerial part of alfalfa; Karvandan village, 11 viii 2009 and 02 ix 2009, 8 (♀♀), aerial part of alfalfa; Kamyaran vicinity, 07 x 2009, 1 (♀) soil and litter under plum tree, *Prunus cerasifera* Ehrh. (Rosaceae); and 1 (♀), soil and litter of tomato; Karvandan village, 24 x 2009, 3 (♀♀), aerial part of alfalfa; Km 40 Sanandaj–Marivan, 24 x 2009, 1 (♀), soil and litter of alfalfa, *Medicago sativa* L. (Fabaceae), and 2 (♀♀), soil and litter under tomato; Sanandaj vicinity, 07 xi 2009, 2 (♀♀), soil and litter under apricot trees, *Prunus armenica* L. (Rosaceae), and 2 (♀♀), soil and litter under sour cherry, *Prunus cerasus* L. (Rosaceae); Naran region, 13 xi 2009, 1 (♀), aerial part of Horse Mint, *Mentha longifolia* (L.) Huds. (Lamiaceae); and aerial part of alfalfa; Chenu region, 19 xi 2009, 13 (♀♀), aerial part of apple trees, *Mallus domestica* Moller (Rosaceae), infested by Woolly apple aphid, *Eriosoma lanigerum* (Hausmann) (Aphididae) and 25 (♀♀), apple fruit under trees and 2 (♀♀), soil and litter of tomato, *Lycopersicum esculentum* Miller (Solanaceae), and 1 (♀), aerial part of raspberry bushes, *Rubus hyrcanus* Juz. (Rosaceae); Kamyaran vicinity, 02 i 2010, 1 (♀), aerial part of Cherry plum; Dalaho vicinity, 1 (♀) unknown host (soil).

Remarks: This species was observed more than other species which were associated with low-growth plants e. g. herbs and also soil and litter of plants.

***Genus Paragigagnathus* Amitai & Grinberg, 1971**
***Paragigagnathus insuetus* (Livshitz & Kuznetsov, 1972)**
Amblyseius insuetus Livshitz & Kuznetsov, 1972: 27.
World distribution: Greece, Turkmenistan, Ukraine (First time on *Tamarix* sp.) (Moraes *et al*., 2004), Iran (Hajizadeh *et al*., 2010) and new for the collected regions of this survey.
Region distribution: Palearctic.
Material examined: Heyran defile, 06 xii 2008, 1 (♀), aerial part of Salt cedar tree, *Tamarix gallica* L. (Tamaricaceae).

Subfamily Phytoseiinae Berlese

Genus *Phytoseius* Ribaga, 1904
***Phytoseius ciliatus* Wainstein, 1975**
Phytoseius (Dubininellus) ciliatus Wainstein, 1975: 921.
World distribution: Russia (First time on unspecified substrate), Iran (Moraes *et al*., 2004) and new for the collected region of this survey.
Region distribution: Palearctic.
Material examined: Fandoghlou forest, 04 xi 2009 and 17 x 2009, 2 (♀♀), aerial part of Hazelnut trees, *Corylus avellanae* L. (Corylaceae).

***Phytoseius plumifer* (Canestrini & Fanzago, 1876)**
Gamasus plumifer Canestrini & Fanzago, 1876: 130.
World distribution: Algeria, Armenia, Azerbaijan, Egypt, France, Georgia, Hungary, Israel, Italy (First time on nettle), Jordan, Kazakhstan, Lebanon, Portugal, Ukraine, USA (Moraes *et al*., 2004), Iran (Faraji *et al*., 2007) and new record for the collected regions of this survey.
Regional distribution: Holoarctic.
Material examined: Sarabe Gamasiab region, 28 ix 2009, 4 (♀♀), aerial part of Yellow goats beard, *Tragopogon major* Jacq (Asteraceae) and 17 x 2010, 1 (♀), aerial part of Chicory, *Cichorium intybus* L. (Asteraceae); Heydareh village, 06 xi 2009, 3 (♀♀), aerial part of apple tree; Hamedan vicinity, 24 vii 2010, 1 (♀), aerial part of Quince trees, *Cydonia oblonga* Mill. (Rosaceae); Sanandaj vicinity, 09 x 2009, 4 (♀♀), aerial part of raspberry bushes, *Rubus hyrcanus* Juz. (Rosaceae); Fandoghlou forest, 05 x 2008, 19 (♀♀), leave of Fig, *Ficus carica* L. (Moraceae), and 05 x 2008, 4 (♀♀), aerial part of Lady Fern bushes, *Athyrium filix–femina* (L.) Roth (Dryopteridaceae), and 05 x 2008, 1 (♀), aerial part of Cypress tree, *Cupressus sempervirens* L. (Cupressaceae) and 05 x 2008, 1 (♀), aerial part of Field Bindweed bushes, *Convolvulus arvensis* L. (Convolvulaceae).

Subfamily Typhlodrominae Wainstein
Tribe Typhlodomini Wainstaein, 1962
Genus *Typhlodromus* Scheuten, 1857
Typhlodromus* (*Anthoseius*) *bagdasarjani
Typhlodromus bagdasarjani Wainstein & Arutunjan, 1967: 1765.
Amblydromella (*Aphanoseia*) *bagdasarjani* Denmark & Welbourn (2002)
World distribution: Armenia (First time on fruit tree), Azerbaijan, Turkmenistan (Moraes *et al*., 2004), Iran (Faraji *et al*., 2007; Asali Fayaz *et al*., 2011a) and new record for the collected regions of this survey.
Regional distribution: Palearctic.
Material examined: Faculty of Agriculture, 25 x 2008 and 10 xi 2009, 2 (♀♀), aerial part of Cypress tree, *Cupressus sempervirens* L. (Cupressaceae), infested by *Cenopalpus pulcher* (Canestrini and Fanzago, 1876) (Tenuipalpidae) and also 10 xi,14 x 2009, 3 (♀♀), aerial part of Plane tree, *Platanus orientalis* L. (Platanaceae), and 24 ix 2009, 1 (♀), aerial part of apple infested by *Bryobia rubrioculus* (Scheuten) (Tetranychidae); Heydareh village, 09 ix 2009, 1 (♀), aerial part of apple; Ghorveh Dar Jazin region, [20–23 x 2009, 12 (♀♀), aerial part of grape, *Vitis vinifera* L.: Vitaceae, 23 x 2009, 1 (♀), aerial part of apple]; Malham Abad village, 19 iii 2011, 3 (♀♀), aerial part of plum infested by scale, *Tecaspis asiatica* Balachowsky (Diaspididae); Sanandaj vicinity, 09 x 2009, 2 (♀♀), aerial part of apple and 1 (♀), aerial part of sour cherry, *Prunus cerasus* L. (Rosaceae), and 1 (♀), aerial part of eggplant, *Solanum melongena* L. (Solanaceae), and 1 (♀), aerial part of Peach tree, *Prunus persica* (L.) Batsch (Rosaceae); Chenu region, 18 x 2009, 1 (♀), aerial part of Sweet cherry tree; 09 xi 2009, 2 (♀♀), aerial part of apple; Sanandaj vicinity, 14 xi 2009, 3 (♀♀), aerial part of apple.

***Typhlodromus* (*Anthoseius*) *khosrovensis* (Arutunjan, 1971)**
Amblydromella khosrovensis Moraes *et al*., (1986)
Typhlodromus khosrovensis Arutunjan, 1971: 306.
World distribution: Armenia (First time on *Betula* sp.) (Moraes *et al*., 2004), Iran (Ueckermann *et al*., 2009; Jafari *et al*., 2011; Asali Fayaz *et al*., 2011a) and new record for the collected regions of this survey.

Regional distribution: Palearctic.
Material examined: Faculty of Agriculture, [08 x 2008, 1 (♀), aerial part of Plane tree, *Platanus orientalis* L. (Platanaceae), 28 x 2008, 1 (♀), aerial part of apple and 01 viii 2010, 12 (♀♀), aerial part of plum infested by Brown mite, *Bryobia rubrioculus* (Scheuten) (Tetranychidae)]; Heydareh village, 06 xi 2009, 2 (♀♀), aerial part of apple tree infested by TSSM and 1 (♀), aerial part of Peach tree, *Prunus persica* (L.) Batsch (Rosaceae).

***Typhlodromus* (*Anthoseius*) *rhenanus* (Oudemans, 1905)**
Amblydromella (Aphanoseia) rhenana (Denmark and Welbourn (2002)
Seiulus rhenanus Oudemans, 1905: 78.
World distribution: Algeria, Azerbaijan, Belgium, Byelorussia, Canada, Cyprus, Denmark, England, Finland, France, Germany (First time on rotting leaves), Hungary, India, Iran, Israel, Italy, Kazakhstan, Madeira Island, Moldova, Montenegro, Netherlands, Northern Ireland, Norway, Poland, Portugal, Russia, Sweden, Switzerland, Turkey, Ukraine, USA (Moraes *et al*., 2004) and new record for the collected regions of this survey.
Region distribution: Holoarctic, Oriental.
Material examined: Heyran region, 28 ix 2008, 2 (♀♀), aerial part of Lady Fern bushes, *Athyrium filix–femina* (L.) Roth (Dryopteridaceae.)

***Typhlodromus* (*Anthoseius*) *rodriguezi* (Denmark & Daneshvar, 1982)**
Amblydromella rodriguezi Denmark & Daneshvar, 1982: 11.
World distribution: Iran (First time on *Malus* sp.)
Region distribution: Palearctic.
Material examined: Faculty of Agriculture, 17 x 2008, 1 (♀), unknown host.

***Typhlodromus* (*Anthoseius*) *tamaricis* (Kolodochka, 1982)**
Anthoseius (*Amblydromellus*) *tamaricis* Kolodochka, 1982: 11.
Amblydromella (*Aphanoseia*) *tamaricis* Denmark & Welbourn, 2002
World distribution: Turkmenistan (First time on *Tamarix* sp.) (Moraes *et al*., 2004), Turkey (Kasap and Çobanoğlu, 2009).
Regional distribution: Palearctic.
Material examined: Heyran region, 28 ix 2008, 2 (♀♀), aerial part of Salt cedar tree.

***Typhlodromus* Scheuten, 1857**
Typhlodromus (Typhlodromus) athiasae (Porath & Swirski, 1965)
Typhlodromus athiasae Porath & Swirski, 1965: 60.
World distribution: Azerbaijan, Egypt, Greece, Iran, Israel (First time on *Citrus* sp.), Jordan, Turkey (Moraes *et al*., 2004) and new record for the collected regions of this survey.
Regional Distribution: Palearctic.
Material examined: Heyran region, 28 ix 2008, 6 (♀♀), aerial part of Cypress tree *Cupressus sempervirens* L. (Cupressaceae).

Typhlodromus* (*Typhlodromus*) *leptodactylus
Typhlodromus leptodactylus Wainstein, 1961: 153.
Typhlodromus (*Oudemanus*) *leptodactylus* (Denmark, 1992)
World distribution: Armenia, Azerbaijan, Georgia (First time on *Juniperus* sp.), Israel, Ukraine (Moraes *et al*., 2004), Iran (Faraji *et al*., 2007) and new record for the collected regions of this survey.
Regional distribution: Palearctic.
Material examined: Heyran region, 26 xii 2008, 2 (♀♀) aerial part of Cypress tree, *Cupressus sempervirens* L. (Cupressaceae).

***Typhlodromus* (*Typhlodromus*) *tubifer* (Wainstein, 1961)**
Typhlodromus tubifer Wainstein, 1961: 157.
World distribution: Armenia, Azerbaijan, Belgium, Caucasus Region, Georgia (unspecified substrate), Iran, Moldova, Turkey (Moraes *et al*., 2004) and new record for the collected regions of this survey.
Regional distribution: Palearctic.

Material examined: Fandoghlou forest, 20 v 2009, 1 (♀), aerial part of Hazelnut tree, *Corylus avellanae* L. (Corylaceae).

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کنه‌های فیتوزییده (Acari: Mesostigmata: Phytoseiidae) در برخی از مناطق غربی و شمال غربی ایران

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چکیده: مطالعه کنه‌های فیتوزئیده در برخی از مناطق غربی و شمال غربی ایران در طی سالهای ۱۳۹۰-۱۳۸۷ صورت گرفت. در این مطالعه، ۲۱ گونه در قالب شش جنس مرتبط با قسمت‌های هوایی، خاک زیر گیاهان زراعی و غیر زراعی و برخی از کنه‌ها و حشرات گیاهخوار جمع‌آوری و شناسایی شد.

واژگان کلیدی: کنه، شکارگر، گیاه‌خوار، فون، ایران.