THIRTY-SEVEN SPECIES OF ORIBATID MITES (ACARI: SARCOPTIFORMES: ORIBATIDA) FROM EAST AZERBAIJAN PROVINCE OF IRAN WITH NEW FIVE GENERA AND SIX SPECIES FOR IRAN FAUNA

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ABSTRACT: During 2006, a faunal study on mites was coducted in alfalfa fields of six regions in East Azerbaijan (Northwest Iran) including Soofian, Payam, Zenooz, Marand, Shabestar and Jolfa, which resulted in collecting, mounting and identifying of 681 mite specimens. In this study 37 species, belonging to 31 genera and 20 families were identified in which 5 genera and 6 species were new records for mite fauna of Iran and 18 genera and 25 species were new records for mite fauna of East Azerbaijan province. Results showed that the maximum mean number was obtained in Shabestar at mid-September. Among identified species, *Oribatula (Zygoribatula) connexa connexa* Berlese, 1904 was more frequently observed.

KEY WORDS: Alfalfa, East Azerbaijan, Fauna, Iran, Oribatida, soil.

In the classic view of Oribatid mites, they comprise more than 9,000 named species (Subias, 2004) representing 172 families. These numbers do not include members of the large cohort Astigmatina (Krantz, 2009). They are called Moss mites, also Beetle mites or armored mites because of their sclerotinized and Beetle-like body (Krantz, 2009). These mites are cosmopolitan and with unrecognizable stigmata. Their tracheal system opens in the coxal cavity of legs I-III (Krantz, 1978). Oribatid mites are present in anywhere, many are arboreal, a few are aquatic and show adaption to all niches. They are usually dominant arthropodes of these ecosystems (Krantz, 2009). Oribatid mites have considerable evolutionary successes, because of having numerous species, habitat variation, variety of their feeding habits, different reproduction procedures, complex life cycle and their morphologic differences. On the other hand, low fertility, long life cycle, without migration life, low dependence of these mites to microhabitats, repeated reproduction of females and their delayed fertility have made them an exception in among Acari (Lebrun & Van Straalen, 1995). Reviewing literature revealed that in Iran, some faunistic studies have been done by Sepasgozarian (1977), Hatami (1991), Faraji & Kamali (1993), Ostovan (1993), Fathipur (1994), Taghavi (1996), Taghavi et al. (1998), Haddad Irani-Nejad (1998, 2004), Barimani & Kamali (1998), Khanjani & Kamali (2000), Haddad Irani-Nejad et al. (2000, 2003, 2004), Akrami (2000, 2005, 2007, 2008), Akrami et al. (2000, 2007, 2009), Bayartogtokh & Akrami (2000a,b), Akrami & Saboori (2001, 2002, 2004a,b), Musavi et al. (2004), Mansur-Ghazi et al. (2006), Baharloo et al. (2006), Akrami & Coetze (2007), Akrami & Subias (2007a,b, 2008a,b,c), Arjmandi-Nejad et al. (2008), Bastan et al. (2008). This study aimed to investigate the occurrence and species diversity of soil Oribatid mite fauna of alfalfa fields of six regions in Northwest Iran (East Azerbaijan Province).

MATERIALS AND METHODS

Oribatid soil mite fauna of alfalfa fields in Northwest of East Azebaijan province (six regions including Soofian, Payam, Zenooz, Marand, Shabestar and Jolfa) was studied at three different times of the year 2006 (mid-May, mid-July and mid-September), based on Nested design (Snedecor and Cochran, 1967). Three fields in each of the six regions with three samples in each field were selected and sampling of them was conducted at three different times. Soil samples were taken of maximum depth of 25 cm. Specimens were transferred to the acarological laboratory of Plant Protection Department, Faculty of Agriculture, University of Tabriz. Mites were extracted by using the Berlese funnel, cleared by Nesbit medium (Krantz, 1978) and mounted in Hoyer's medium. Type specimens are held in the Acarological laboratory, Department of Plant Protection, Faculty of Agriculture, University of Tabriz, Tabriz, Iran.

RESULTS

In this study 37 species, belonging to 31 genera and 20 families were identified in which 5 genera and 6 species were new records for mite fauna of Iran and 18 genera and 25 species were new records for mite fauna of East Azerbaijan province. Results indicated that the maximum number of Oribatid mites was obtained in Shabestar which obtained in mid-September.

Key to the Oribatid families, genera and species collected from soil of alfalfa fields in Northwest Iran, East Azarbaijan province:

1- At least with one of fallowing traits: Prodorsum can be shut back like the blade of a penknife to the hysterosoma; tibia and genu of about uniform length and shape; genital and anal plates meeting and accupying entire length of ventral region (Archoribatida: Macropylina) 2
- without the above characteristics (Brachypylina: Euoribatida).....10

2- Body ptychoid and considerably compressed laterally; Anogenital region of macropyline type, narraw and V-shaped; the plates of anogenital region fused with each other into one pair of anogenital plates; Interlocking triangle present (Euphthiracaridae).....
.....*Rhysotritia ardua*
- Body not ptychoid and never compressed laterally 3

3- Notogaster separated by 1-3 sutures in to 2-4 shields (Arthronotic Macropylina) 4
- Notogaster without transverse sutures (Holonotic Macropylina) 7

4- Notogaster with large polygonal reticulation and separated by one suture in to two shields; seta *d* situated on suture; some of notogasteral setae T-shaped (Sphaerochthoniidae)..... *Sphaerochthonius splendidus*
- Notogaster seprated by 2 sutures in to 3 shields (Brachychthoniidae) 5

5- Setae d_2 not in a marginal position, originating considerably more mediad from setae *cp*-e_2 aligned in a raw; one suprapleural plate present or absent..... *Liochthonius tuxeni*
- Setae d_2 in a marginal position, aligned with the longitudinal raw of setae *cp*-e_2; two or more pairs of suprapleural plates present 6

6- Two anterior pairs of adanal setae (ad_2 and ad_3) bladelike ..... *Sellnickochthonius* sp.
- Only median pair of adanal setae (ad_2) bladelike ..... *Poecillochthonius italicus*

7- Body holoid; agenital and adanal shields separate; prodorsum with bothridium; without agenital setae; with preanal plate; with epimeral neotrichy (Nothridae) ....*Nothrus anauniensis*
- Body dichoid; with Protero-hysterosomatic articulation 8

8- Ventral plate Schizogasteric type; with a transverse suture between genital and anal plates; with 8 pairs of genital setae arrange in two longitudinal rows of five and three setae; notogaster with 14 pairs of setae (Epilohmanniidae) ..... *Epilohmannia cylindrica cylindrica*
- Preanal plate between genital and anal plates present; genital plates seprated by one suture in to 2 shields; with 10 pairs of genital setae arrange in two longitudinal rows of six and four setae; body more or less cylindrical; notogaster with 16 pairs of setae; legs short and thick (Lohmanniidae) 9

9- Preanal plate broad ..... *Lohmannia turcmenica*
- Preanal plate narrow ..... *Papillacarus angulatus*

10- Without pteromorphae; notogaster pycnonotic and without octotaxic organs (Area porosae, Sacculi or Pori) (Pycnonotic Brachypylina) 11
- With or without pteromorphae; notogaster poronotic and at least with one of octotaxic organs (except of Microzetidae) (Poronotic Brachypylina) 26

11- Lamellae true, broad and marginnaly situated (Tectocepheidae) 12
- Prodorsum without true lamellae, with or without costula 13

12- Lyrifissure *iad* long and situated in anterior margin of anal operture at an angle about 60-90° to the body axis ..... *Tectocepheus velatus*
- Lyrifissure *iad* long and situated in anterior margin of anal plates that almost parallel to the lateral margin of anal operture ..... *Tectocepheus minor*

13- With genital neotrichy (with at least 3-4 pairs of agenital setae); without anal neotrichy; anal plates with two pairs of setae; legs monodactylus; epimeral, genital and agenital setae without branches; lamellar setae close to rostral setae (Damaeolidae)..... ..... *Fuseremeus laciniatus*
- Usually without ventral neotrichy; ventral plate with four pairs of setae (one pair of agenital and three pairs of adanal setae) 14

14- Chelicerae long and Peloptoid (Suctobelbidae) ..... *Suctobelbella* sp.
- Chelicerae normal (Oppiidae)..... 15

15- With crest; seta c_2 usually fine recognizable; usually with interbotridial tubercles; lyrifissure *iad* usually paranal 16
- Without crest; seta c_2 absent or less developed than other notogasteral setae; usually without interbotridial tubercles; lyrifissure *iad* in various forms; with lamellr and (or) interlamellar lines (if they are absent, sensillus pectinate or ciliate) 19

16- With costulae (Oppiellinae) ..... *Oppiella nova*
- Without costulae, but exceptionally with lamellar lines; notogaser with 10 pairs of setae (Medioppiinae) 17

17- Anterior margin of notogaster with two sclerotinized apophyses that extend from dorsal suture to basis of prodorsum ..... *Microppia minus*
- Anterior margin of notogaster with lines or crest (*Rhinoppia*) 18

18- Sensillus fusiform ..... *Rhinoppia obsoleta*
- Sensillus bipectinate ..... *Rhinoppia bipectinata*

19- Without crest; body setae fine developed, broad and ciliate; with recognizable grooves on anterior part of notogaster (Mysteroppiinae) ..... *Striatoppia* sp.

- With crest; body setae normal; without recognizable grooves on anterior part of notogaster (Multioppiinae) 20

20- Lyrifissure *iad* direct apoanal ..... *Graptoppia* (*Graptoppia*) *sundensis acuta*
- Lyrifissure *iad* paranal 21

21- Notogaster with 10 pairs of relatively long setae ..... *Anomaloppia iranica*
- Notogaster with 9 pairs of relatively long setae (c_2 absent or reduced) (*Ramusella*)..... 22

22- Rostral setae more or less arcuate, alveoli of rostral setae more or less Indented..... ..... *Ramusella* (*Insculptoppia*) *insculpta*
- Rostral setae geniculate, alveoli of rostral setae close to each other (*Ramusella* (*Ramusella*)) 23

23- Prodorsum with median crest; sensillus pectinate ....*Ramusella* (*Ramusella*) *puerttontensis*
- Prodorsum with lamellar line; sensillus fusiform 24

24- Sensillus with short ciliae ..... *Ramusella* (*Ramusella*) *sengbuschi tokyoensis*
- Sensillus with long ciliae 25

25- Interlamellar setae longer than lamellar setae ..... *Ramusella* (*Ramusella*) *curtipilus*
- Interlamellar setae equal with lamellar setae ..... *Ramusella* (*Ramusella*) *sengbuschi*

26- Without octotaxic organs; notogaster with immovable and bented down pteromorphae; with very large and fine developed lamellae; apodemata IV thickened; notogaster with 4 longitudinal lines (Microzetidae) ..... *Berlesozetes aegypticus*
- At least with one of octotaxic organs 27

27- Pteromorphae large, movable and auriculate (Galumnidae)..... 28
- Pteromorphae if present and movable, not auriculate 31

28- Interlamellar setae originate between lines L and L ..... *Pergalumna* sp.
- Interlamellar setae originate between lines L and S (*Galumna*)..... 29

29- With liplike regions on pteromorphae ..... *Galumna rossica*
- Without liplike regions on pteromorphae 30

30-Sensillus setiform..... *Galumna karajica*
- Sensillus fusiform..... *Galumna iranensis*

31- Lamellae very large, broad, infused in median line and cover surface of prodorsum (Oribatellidae) 32
- Lamellae if present not infused, sometimes in lateral margins of prodorsum and sometimes connected with together by translamella 33

32- Notogaster with 13 pairs of setae; anterior part of notogaster with hexagonal reticulation ..... *Pseudotectoribates* sp.
- Notogaster with 10 pairs of setae; anterior part of notogaster without hexagonal reticulation ..... *Anachipteria deficiens*

33- Prodorsum with tutorium and lamella usually with cuspis (Punctoribatidae) .... *Punctoribates liber*
- Prodorsum without tutorium and lamella usually without cuspis 34

34- Interlamellar setae long and leaf-shaped (Phenopelopidae)..... *Eupelops acromios*
- Interlamellar setae normal 35

35- Anterior part of notogaster with circular lenticulus, genital plates with 5 pairs of setae (Passalozetidae) ..... *Passalozetes africanus*
- Anterior part of notogaster without lenticulus 36

36- Notogaster usually with 4 pairs of area porose 37
- Notogaster usually with 4 pairs of sacculi 43

37- Notogaster with immovable pteromorphae (Liebstadiidae) ..... *Liebstadia similis*
- Notogaster without pteromorphae (Oribatulidae) 38

38- Prodorsum without translamella ..... *Oribatula* (*Oribatula*) *pallida*
- Prodorsum with translamella (*Oribatula* (*Zygoribatula*) 39

39- Surface of notogaster with fingerprint lines 40
- Surface of notogaster without fingerprint lines 41

40- Area porose *Aa* almost round ..... *Oribatula* (*Zygoribatula*) *connexa connexa*
- Area porose *Aa* streched ..... *Oribatula* (*Zygoribatula*) *connexa ucrainica*

41- Area poroses perfectly round and equal with together .....
..... *Oribatula (Zygoribatula) debilitranslamellata*
- Area poroses not equal with together 42

42- Translamella narrow, lamellar setae equal with rostral setae .....
..... *Oribatula* (*Zygoribatula*) *skrajabini*
- Translamella thick, lamellar setae longer than rostral setae .....
.....*Oribatula* (*Zygoribatula*) *undulate*

43- Pteromorphae movable (Haplozetidae) ..... *Protoribates paracapucinus*
- Pteromorphae immovable (Scheloribatidae) ..... *Scheloribates fimbriatus*

Archoribatida: Macropylina
Ptychtima
Family Euphthiracaridae Jacot, 1930
Rhysotritia ardua (C. L. Koch, 1841)

Materials examined and associations: 10 specimens, Soofian, mid-May and mid-September 2006; 4 specimens, Marand, mid-May and mid-September 2006; 4 specimens, Shabestar, mid- September 2006; 3 specimens, Payam, mid- May 2006.
Previous provincial records for Iran: Mazandaran (Akrami et al., 2006); East Azerbaijan (Haddad Irani-Nejad, 2003); Yazd (Bayartogtokh & Akrami, 2000a); Hamedan (Khanjani, 1996); Mazandaran (Akrami & Saboori, 2004); Kurdestan (Mansur-Ghazi, et al., 2006); Mazandaran (Akrami et al., 2006); Ahvaz (Baharloo et al., 2006); Sistan (Arjmandi-Nejad et al., 2008).
Comments: This is the second and tenth record for the province and Iran respectively.

Arthronotic Macropylina
Family Sphaerochthoniidae Grandjean, 1947
Sphaerochthonius splendidus (Berlese, 1904)

Materials examined and associations: 2 specimens, Shabestar, mid- September 2006.
Previous provincial records for Iran: East Azerbaijan (Haddad Irani-Nejad, 2003); Yazd (Bayartogtokh & Akrami, 2000a); Hamedan (Khanjani, 1996); Mazandaran (Akrami & Saboori, 2004).
Comments: This is the second and fifth record for the province and Iran respectively.

Family Brachychthoniidae Thor, 1934
Liochthonius tuxeni (Forsslund, 1957)

Materials examined and associations: 2 specimens, Marand, mid- September 2006.
Previous provincial records for Iran: There is no provincial record of this genus in Iran.

Comments: This is the first record for Iran.

Poecillochthonius italicus (Berlese, 1910)

Materials examined and associations: 1 specimen, Soofian, mid- May 2006; 2 specimens, Marand, mid- July 2006; 1 specimen, Zenooz, mid- September 2006; 5 specimens, Shabestar, mid- May 2006; 1 specimen, Payam, mid- September 2006; 2 specimens, Jolfa, mid- September 2006.
Previous provincial records for Iran: East Azerbaijan (Haddad Irani-Nejad, 2003); Mazandaran (Akrami et al., 2006).
Comments: This is the second and third record for the province and Iran respectively.

Sellnickochthonius sp.

Materials examined and associations: 2 specimens, Soofian, mid- September 2006; 7 specimens, Marand, mid- September 2006; 4 specimen, Zenooz, mid- September 2006; 2 specimens, Shabestar, mid- May 2006.
Previous provincial records for Iran: There is no provincial record of this genus in Iran.
Comments: This is the first record for Iran.

Holonotic Macropylina
Family Nothridae Berlese, 1885
Nothrus anauniensis Canestrini & Fanzago, 1877

Materials examined and associations: 4 specimens, Soofian, mid- July and mid-September 2006; 5 specimens, Marand, mid- July and mid-September 2006; 2 specimen, Zenooz, mid-September 2006; 4 specimens, Shabestar, mid- May, mid- July and mid-September 2006; 11 specimen, Payam, mid- July and mid-September 2006; 3 specimens, Jolfa, mid- May, mid-July and mid-September 2006.
Previous provincial records for Iran: East Azerbaijan (Haddad Irani-Nejad, 2003); Mazandaran (Akrami et al., 2006); Mazandaran (Akrami & Saboori, 2004).
Comments: This is the second and fourth record for the province and Iran respectively.

Family Epilohmanniidae Oudemans, 1923
Epilohmannia cylindrica cylindrica (Berlese, 1904)

Materials examined and associations: 4 specimens, Soofian, mid- July and mid-September 2006; 5 specimens, Marand, mid- September 2006; 1 specimen, Zenooz, mid- September 2006; 6 specimens, Shabestar, mid- July and mid-September 2006; 3 specimens, Jolfa, mid-May, mid- July and mid-September 2006.
Previous provincial records for Iran: East Azerbaijan (Haddad Irani-Nejad, 2003); Mazandaran (Akrami et al., 2006); Kurdestan (Mansur-Ghazi, et al., 2006); Ahvaz (Baharloo et al., 2006); Sistan (Arjmandi-Nejad et al., 2008).
Comments: This is the second and sixth record for the province and Iran respectively.

Family Lohmanniidae Berlese, 1916
Lohmannia turcmenica Bulanova-Zachvatkina, 1960

Materials examined and associations: 1 specimen, Zenooz, mid- July 2006.
Previous provincial records for Iran: Mazandaran (Akrami et al., 2006); Hamedan (Khanjani, 1996).
Comments: This is the first and third record for the province and Iran respectively.

Papillacarus angulatus Wallwork, 1962

Materials examined and associations: 6 specimens, Shabestar, mid- May 2006.
Previous provincial records for Iran: There is no provincial record of this species in Iran.
Comments: This is the first and second record of this genus for the province and Iran respectively and this is the first record for Iran.

Brachypylina: Euoribatida
Pycnonotic Brachypylina
Family Tectocepheidae Grandjean, 1954

Tectocepheus velatus (Michael, 1880)

Materials examined and associations: 15 specimens, Soofian, mid- May, mid- July and mid-September 2006; 17 specimens, Marand, mid-May, mid- July and mid-September 2006; 16 specimen, Zenooz, mid- May, mid- July and mid-September 2006; 10 specimens, Shabestar, mid- May, mid- July and mid-September 2006; 3 specimen, Payam, mid- May, mid- July and mid-September 2006; 5 specimens, Jolfa, mid- May, mid- July and mid-September 2006.
Previous provincial records for Iran: Bayartogtokh & Akrami (2000a); Markazi (Bastan et al., 2008).
Comments: This is the first and third record for the province and Iran respectively.

Tectocepheus minor Berlese, 1903

Materials examined and associations: 2 specimens, Soofian, mid- May 2006; 1 specimen, Zenooz, mid-May 2006; 2 specimens, Shabestar, mid- May 2006; 3 specimen, Payam, mid-May, mid- July and mid-September 2006.
Previous provincial records for Iran: Yazd (Bayartogtokh & Akrami, 2000a); Mazandaran (Akrami & Saboori, 2004); Markazi (Bastan et al., 2008).
Comments: This is the first and fourth record for the province and Iran respectively.

Family Damaeolidae Grandjean, 1965

Fuseremeus laciniatus (Berlese, 1905)

Materials examined and associations: 4 specimens, Soofian, mid- May 2006; 3 specimens, Zenooz, mid- May 2006.
Previous provincial records for Iran: Esfahan (Akrami, 2007).
Comments: This is the first and second record for the province and Iran respectively.

Family Suctobelbidae Jacot, 1938

Suctobelbella sp.

Materials examined and associations: 1 specimen, Payam, mid- July 2006.
Previous provincial records for Iran: Mazandaran (Akrami, 2008).
Comments: This is the first and second record for the province and Iran respectively. Identification at species level is on going.

Family Oppiidae Grandjean, 1954
Subfamily Oppiellinae Seniczak, 1975

Oppiella nova (Oudemans, 1902)

Materials examined and associations: 1 specimen, Payam, mid- September 2006.
Previous provincial records for Iran: Mazandaran (Akrami & Subías, 2007a); Markazi (Bastan et al., 2008); Mazandaran (Akrami, 2008).
Comments: This is the first and fourth record for the province and Iran respectively.

Subfamily Medioppiinae Subias & Minguez, 1985

Microppia minus (Paoli, 1908)

Materials examined and associations: 1 specimen, Soofian, mid- May 2006.
Previous provincial records for Iran: Mazandaran (Akrami & Subías, 2007a); Mazandaran (Akrami, 2008).
Comments: This is the first and third record for the province and Iran respectively.

Rhinoppia obsoleta (Paoli, 1908)

Materials examined and associations: 20 specimens, Shabestar, mid- September 2006.
Previous provincial records for Iran: Mazandaran (Akrami & Subías, 2007a); Mazandaran (Akrami, 2008).
Comments: This is the first and third record for the province and Iran respectively.

Rhinoppia bipectinata (Akrami & Subías, 2007)

Materials examined and associations: 3 specimens, Shabestar, mid- September 2006.
Previous provincial records for Iran: Mazandaran (Akrami & Subías, 2007a).
Comments: This is the first and second record for the province and Iran respectively.

Subfamil Mysteroppiinae Balogh, 1983
***Striatoppia* sp.**
Materials examined and associations: 1 specimen, Zenooz, mid-May 2006.
Previous provincial records for Iran: There is no provincial record of this genus in Iran.
Comments: This is the first record for Iran. Identification at species level is on going.

Subfamily Multioppiinae Balogh, 1983
***Graptoppia* (*Graptoppia*) *sundensis acuta* Ayyildiz, 1989**
Materials examined and associations: 1 specimen, Soofian, mid- May 2006; 1 specimens, Marand, mid- September 2006; 1 specimen, Zenooz, mid-May 2006; 1 specimens, Shabestar, mid- May 2006; 1 specimen, Payam, mid- July 2006.
Previous provincial records for Iran: There is no provincial record of this species in Iran.
Comments: This is the first and third record of *Graptoppia* for the province and Iran respectively and the first record of *G.* (*G.*) *sundensis acuta* for Iran.

***Anomaloppia iranica* Bayartogtokh & Akrami, 2000**
Materials examined and associations: 1 specimen, Shabestar, mid- September 2006.
Previous provincial records for Iran: Yazd (Bayartogtokh & Akrami, 2000a).
Comments: This is the first and second record for the province and Iran respectively.

***Ramusella (Insculptoppia) insculpta* (Paoli, 1908)**
Materials examined and associations: 1 specimen, Shabestar, mid- September 2006.
Previous provincial records for Iran: Mazandaran (Akrami & Subías, 2007a); Markazi (Bastan et al., 2008); Mazandaran (Akrami, 2008).
Comments: This is the first and fourth record for the province and Iran respectively.

***Ramusella (Ramusella) puertonttensis* Hammer, 1962**
Materials examined and associations: 1 specimen, Shabestar, mid- May 2006.
Previous provincial records for Iran: Mazandaran (Akrami & Subías, 2007a); Markazi (Bastan et al., 2008).
Comments: This is the first and third record for the province and Iran respectively.

***Ramusella (Ramusella) sengbuschi sengbuschi* Hammer, 1968**
Materials examined and associations: 6 specimens, Soofian, mid- May 2006; 2 specimen, Zenooz, mid-May 2006; 4 specimens, Shabestar, mid- May and September 2006.
Previous provincial records for Iran: Mazandaran (Akrami & Subías, 2007a); Mazandaran (Akrami, 2008).
Comments: This is the first and third record for the province and Iran respectively.

***Ramusella (Ramusella) sengbuschi tokyoensis* (Aoki, 1974)**
Materials examined and associations: 8 specimens, Soofian, mid- May and July 2006; 10 specimens, Shabestar, mid- May 2006.
Previous provincial records for Iran: Mazandaran (Akrami & Subías, 2007a); Mazandaran (Akrami, 2008).
Comments: This is the first and third record for the province and Iran respectively.

***Ramusella (Ramusella) curtipilus* Hammer, 1971**
Materials examined and associations: 1 specimen, Jolfa, mid- May 2006.
Previous provincial records for Iran: Mazandaran (Akrami & Subías, 2007a); Mazandaran (Akrami, 2008).
Comments: This is the first and third record for the province and Iran respectively.

Poronotic Brachypylina
Family Microzetidae Grandjean, 1936
***Berlesozetes aegypticus* (Bayoumi, 1977)**
Materials examined and associations: 1 specimen, Jolfa, mid- May 2006.

Previous provincial records for Iran: Yazd (Akrami, 2007); Yazd (Akrami & Saboori, 2002).
Comments: This is the first and third record for the province and Iran respectively.

Family Galumnidae Jacot, 1925
***Galumna karajica* Mahunka & Akrami, 2001**
Materials examined and associations: 2 specimens, Soofian, mid- September 2006; 5 specimens, Marand, mid- September 2006.
Previous provincial records for Iran: Mazandaran (Akrami et al., 2006); Yazd (Akrami & Saboori, 2002); Markazi (Bastan et al., 2008).
Comments: This is the first and fourth record for the province and Iran respectively.

***Galumna iranensis* Mahunka & Akrami, 2001**
Materials examined and associations: 3 specimens, Soofian, mid- September 2006; 3 specimens, Marand, mid- September 2006; 3 specimens, Jolfa, mid- September 2006.
Previous provincial records for Iran: Yazd (Akrami & Saboori, 2002).
Comments: This is the first and second record for the province and Iran respectively.

***Galumna rossica* Sellnick, 1926**
Materials examined and associations: 1 specimen, Zenooz, mid-May 2006.
Previous provincial records for Iran: There is no provincial record of this species in Iran.
Comments: This is the first record for Iran.

***Pergalumna* sp.**
Materials examined and associations: 16 specimens, Payam, mid- September 2006.
Previous provincial records for Iran: East Azerbaijan (Fathipour, 1994); Esfahan (Hatami, 1991); Hamedan (Khanjani, 1996).
Comments: This is the second and fourth record for the province and Iran respectively. Identification at species level is on going.

Family Oribatellidae Jacot, 1925
***Pseudotectoribates* sp.**
Materials examined and associations: 2 specimens, Jolfa, mid- September 2006.
Previous provincial records for Iran: There is no provincial record of this genus in Iran.
Comments: This is the first record for Iran. Identification at species level is on going.

***Anachipteria deficiens* Grandjean, 1932**
Materials examined and associations: 3 specimens, Soofian, mid- May 2006; 1 specimen, Jolfa, mid- May 2006.
Previous provincial records for Iran: There is no provincial record of this genus in Iran.
Comments: This is the first record for Iran.

Family Punctoribatidae Thor, 1937
***Punctoribates liber* Paulitchenko, 1991**
Materials examined and associations: 10 specimens, Shabestar, mid-May and September 2006.
Previous provincial records for Iran: Mazandaran (Akrami et al., 2006).
Comments: This is the first and second record for the province and Iran respectively.

Family Phenopelopidae Petrunkevitch, 1955
***Eupelops acromios* (Herman, 1804)**
Materials examined and associations: 1 specimen, Zenooz, mid- July 2006.
Previous provincial records for Iran: Mazandaran (Akrami et al., 2006).
Comments: This is the first and second record for the province and Iran respectively.

Family Passalozetidae Grandjean, 1954
***Passalozetes africanus* Grandjean, 1932**
Materials examined and associations: 1 specimen, Marand, mid- July 2006.

Previous provincial records for Iran: East Azerbaijan (Haddad Irani-Nejad, 2003); Yazd (Bayartogtokh & Akrami, 2000_b); Mazandaran (Akrami et al., 2006).
Comments: This is the second and fourth record for the province and Iran respectively.

Family Liebstadiidae J. & P. Balogh, 1984
Liebstadia similis (Michael, 1888)

Materials examined and associations: 1 specimen, Zenooz, mid-May 2006; 2 specimens, Jolfa, mid- May 2006.
Previous provincial records for Iran: Mazandaran (Taghavi, 1996); Mazandaran (Taghavi et al., 1998_a).
Comments: This is the first and third record for the province and Iran respectively.

Family Oribatulidae Thor, 1929
Oribatula (oribatula) pallida Banks, 1906

Materials examined and associations: 4 specimens, Shabestar, mid- May and September 2006.
Previous provincial records for Iran: Mazandaran (Akrami et al., 2006); Hamedan (Khanjani, 1996).
Comments: This is the first and third record for the province and Iran respectively.

Oribatula (Zygoribatula) connexa connexa Berlese, 1904

Materials examined and associations: 50 specimens, Soofian, mid-May, mid- July and mid-September 2006; 63 specimens, Marand, mid-May, mid- July and mid-September 2006; 56 specimen, Zenooz, mid-May, mid- July and mid-September 2006; 100 specimens, Shabestar, mid-May, mid- July and mid-September 2006; 20 specimen, Payam, mid-May, mid- July and mid-September 2006; 30 specimens, Jolfa, mid-May, mid- July and mid-September 2006.
Previous provincial records for Iran: East Azerbaijan (Haddad Irani-Nejad, 2003); Yazd (Bayartogtokh & Akrami, 2000_b); Mazandaran (Akrami et al., 2006); East Azerbaijan (Fathipour, 1994); Ardebil (Haddad Irani-Nejad, 1998); Hamedan (Khanjani, 1996); West Azerbaijan (Musavi et al., 2004); Ahvaz (Baharloo et al., 2006).
Comments: This is the third and ninth record for the province and Iran respectively. Among identified species, this species was more frequently observed. In some specimens of this species collected from Zenooz in mid-May, there is one extra seta that it is most probabely abnormality.

Oribatula (Zygoribatula) connexa ucrainica (Iordanisky, 1990)

Materials examined and associations: 11 specimens, Marand, mid-July and mid-September 2006.
Previous provincial records for Iran: Mazandaran (Akrami et al., 2006).
Comments: This is the first and second record for the province and Iran respectively.

Oribatula (Zygoribatula) debilitranslamellata Kulijev, 1962

Materials examined and associations: 3 specimens, Soofian, mid-May, mid- July and mid-September 2006; 3 specimens, Marand, mid-May, mid- July and mid-September 2006; 4 specimen, Zenooz, mid-May, mid- July and mid-September 2006; 2 specimens, Shabestar, mid-May and mid-September 2006; 1 specimen, Payam, mid-September 2006; 2 specimens, Jolfa, mid-May and mid-September 2006.
Previous provincial records for Iran: There is no provincial record of this species in Iran.
Comments: This is the first record for Iran.

Oribatula (Zygoribatula) skrajabini (Bulanova-Zachvatkina, 1967)

Materials examined and associations: 3 specimens, Shabestar, mid- September 2006.
Previous provincial records for Iran: Mazandaran (Akrami et al., 2006).
Comments: This is the first and second record for the province and Iran respectively.

Oribatula (Zygoribatula) undulata Berlese, 1916

Materials examined and associations: 2 specimens, Soofian, mid- May 2006; 4 specimens, Shabestar, mid- September 2006; 2 specimens, Jolfa, mid- May and July 2006.
Previous provincial records for Iran: Mazandaran (Akrami et al., 2006); Hamedan (Khanjani, 1996); Markazi (Bastan et al., 2008); Sistan (Arjmandi-Nejad et al., 2008).
Comments: This is the first and fifth record for the province and Iran respectively.

Family Haplozetidae Grandjean, 1936
Protoribates paracapucinus (Mahunka, 1988)

Materials examined and associations: 4 specimens, Soofian, mid-May and mid-September 2006; 2 specimens, Jolfa, mid- September 2006.
Previous provincial records for Iran: Yazd (Bayartogtokh & Akrami, 2000b); Mazandaran (Akrami et al., 2006); Markazi (Bastan et al., 2008).
Comments: This is the first and fourth record for the province and Iran respectively.

Family Scheloribatidae Jacot, 1935
Sheloribates laevigatus (Koch, 1835)

Materials examined and associations: 10 specimens, Jolfa, mid- May 2006.
Previous provincial records for Iran: Kazeroon (Ostovan, 1993); Kurdestan (Mansur-Ghazi, et al., 2006).
Comments: This is the first and third record for the province and Iran respectively.

DISCUSSION

Distribution of this suborder in six regions showed that the maximum number of the suborder was in Shabestar at mid-September; the number of mites from high to low was in Shabestar, Soofian, Marand, Zenooz, Jolfa and Payam respectively. But number of identified species from high to low was obtained in Shabestar (with 23 species), Soofian (with 19 species), Jolfa (with 15 species), Zenooz (with 15 species), Marand (with 14 species), and Payam (with 11 species) respectively. Dependence of mites diversity with frequency has been studied by many authors like Bedano et al. (2005), Toros & Emekci (1989), Fathi Poor (1994), Ardashir (2004) and Lotfollahi et al. (2010) and has showed that at the case of high temprature and low humidity, the diversity and frequency of mites are increased. But in this study number of oribatid mites from high to low was obtained in mid-September, mid-May and mid-July respectively.

Faunastic and biological studies on oribatid mites in Iran are very few. Therefore, because of their important role of in soil formation, transmission of tapeworms and etc. more studies in this field is needed.

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