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Introduction of thirty two species of Brachypyline oribatid mites (Acari: Oribatida: Brachypylina). New records for the fauna of Guilan Province (Iran)

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A b s t r a c t : Faunal study of cryptostigmatic mites in Rasht township (Guilan Province – Iran) was conducted during 2008-2009. Totally, 32 species belonging to 23 genera and 16 families of Brachypyline oribatid mites (Acari: Oribatida: Brachypylina) were collected and identified. All families, genera and species are new records for Guilan Province mite's fauna and one species is the first record for Iran.

K e y w o r d s : Acari, Oribatida, Brachypylina, Guilan, Iran, Fauna.

Introduction

Oribatid mites are one of the numerically dominant arthropod groups in the organic horizons of most soils (NORTON 1990). These mites are actively involved in decomposition of organic matters, in nutrient cycling and in soil formation (BAYOUMI & AL-KHALIFA 1996). Some oribatid mites act as intermediate hosts of tapeworms of the Anoplocephalidae (DENEGRI 1993). Also, their role as bioindicators in ecotoxicological experiments and assessment of air and soil quality is significant (LEBRUN & van STRAALLEN 1995; BEHAN-PELLETIER 1999).

Guilan Province, Northern Iran, is located between the latitudes 37°1' and 37°27' N and longitudes 48°35' and 49°3' E. This Province is bounded on the north by the Caspian sea, on the east by Mazandaran, on the south by Ghazvin and Zanjan and on the west by Azarbayjan Provinces. Rasht township covers an area of 605,1252 km². This part of Iran because of geographic position (located on central flat, prolific soils and lands) consists high density of edaphic mites specially oribatid mites. There is little information on the oribatid mite fauna of Iran. Some of studies on Iranian oribatid mite fauna are BAYARTOGTOKH & AKRAMI, 2000a, b, MAHUNKA & AKRAMI 2001, AKRAMI & SABOORI 2001, 2004, HADDAD IRANI-NEJAD et al. 2000, 2002, 2003, AKRAMI 2007, 2008, AKRAMI & COETZEE 2007, AKRAMI & SUBIAS 2007a, b, 2008a, b, 2009 and AKRAMI et al. 2007, 2008, 2009. In the course of this study on the oribatid mite fauna of Rasht township (Iran), 32 species belonging to 23 genera and 16 families of Brachypyline oribatid mites (Acari: Oribatida: Brachypylina) were collected and identified. All families, genera and species are new records for Guilan Province mite's fauna and one species is the first record for Iran.

Materials and methods

Soil samples were taken from different habitats during 2008-2009. Each sample contains about 5 kg soil taken from the surface to a depth of 15 cm. The Mites were extracted by Berlese funnel. Then collected and preserved in 75 % ethanol and cleared in lactophenol. Cleared mites were mounted in Hoyer's medium on microscopic slides. The slides were placed in an oven at 45 °C for two weeks. Specimens were identified using valid keys (BALOGH & BALOGH 1992a, b) and sent to the specialist of oribatid mites for confirmation. All specimens are deposited in the Department of Plant Protection, Guilan University, Iran.

Results

Hermannelliidae GRANDJEAN 1934

***Hermanniella dolosa* GRANDJEAN 1931**

Material: Rasht, Saravan forest, 97 m a.s.l, soil under Medlar: *Mespilus germanica* L. (Rosaceae), 12.VII.2008, leg. Sh. Mortazavi.

Distribution: Palearctic region, Iran (SUBIAS 2004, AKRAMI et al. 2008).

Amerobelbidae GRANDJEAN 1954

***Amerobelba decedens* BERLESE 1908**

Material: Rasht, Kucheshfahan, 0,91 m a.s.l, soil under Fig: *Ficus carica* L. (Moraceae), 27.VII.2008, leg. Sh. Mortazavi.

Distribution: Mediterranean species, Iran (SUBIAS 2004, AKRAMI et al. 2008).

Eremulidae GRANDJEAN 1965

***Eremulus avenifer* BERLESE 1913**

Material: Rasht, Shaft, 46 m a.s.l, soil under Elm: *Ulmus minor* MILL. (Ulmaceae), 5.VIII.2008, leg. Sh. Mortazavi; Rasht city, Guilan University, 25 m a.s.l, soil under Rice: *Oryza sativa* L. (Poaceae), 29.IV.2008, leg. Sh. Mortazavi.

Distribution: Italy, Japan, Iran, Vietnam, Tahiti and India (GHOSH & BHADURI 1979, BAYARTOGTOKH & AKRAMI 2000a).

Xenillidae WOOLLEY et HIGGINS 1966

***Xenillus (Xenillus) singularis* GOLOSOVA & LJASHCHEV 1984**

Material: Rasht, Saravan forest, 97 m a.s.l, soil under Elm (*U. minor*) and Oak: *Quercus castaneifera* C.A.MEY. (Fagaceae), 12.VII.2008, leg. Sh. Mortazavi.

Distribution: Sakhalin and Iran (SUBIAS 2004, AKRAMI 2006).

Gustaviidae OUDEMANS 1900

***Gustavia microcephala* (NICOLET 1855)**

Material: Rasht, Saravan forest, 97 m a.s.l, soil under Pine (*P. silvestris*), Elm (*U. minor*) and Oak (*Q. castaneifera*) 12.VII.2008, leg. Sh. Mortazavi.

Distribution: Palaearctic region, Iran (SUBIAS 2004, AKRAMI et al. 2008).

Tectocephidae GRANDJEAN 1954

***Tectocephus velatus* (MICHAEL 1880)**

Material: Rasht city, Guilan University, 25 m a.s.l, soil under Spruce: *Populus deltoides* BARTR. ex MARSH. (Salicaceae), 14.V.2008, leg. Sh. Mortazavi.

Distribution: Cosmopolitan (BAYARTOGTOKH & AKRAMI 2000a).

***Tectocephus minor* BERLESE, 1903**

Material: Rasht, Sangar, 27 m a.s.l, soil under Spruce (*P. deltoids*), 30.X.2008, leg. Sh. Mortazavi.

Distribution: USA, Hong Kong, New Zealand and Iran (BAYARTOGTOKH & AKRAMI 2000a).

Epimerellidae AYYILDIZ & LUXTON 1989

***Epimerella smirnovi* (KULIJEV 1962)**

Material: Rasht, Saravan forest, 97 m a.s.l, soil under Elm (*U. minor*), 12.VII.2008, leg. Sh. Mortazavi.

Distribution: Southeast Europe and Iran (SUBIAS, 2004 AKRAMI 2008b).

Oppiidae SELLNICK 1937

***Rhinoppia bipectinata* AKRAMI & SUBIAS 2007**

Material: Rasht, Saravan forest, 97 m a.s.l, soil under Pine (*P. silvestris*), 12.VII.2008, leg. Sh. Mortazavi; Rasht, Khomam, -60 m a.s.l, soil under Elm (*U. minor*), 14.VIII.2008, leg. Sh. Mortazavi.

Distribution: Iran (AKRAMI & SUBIAS 2007a).

***Rhinoppia subpectinata* (OUDEMANS 1900)**

Material: Rasht, Saravan forest, 97 m a.s.l, soil under Pine (*P. silvestris*) and Evangelic: *Parrotia persica* C.A.Mey. (Hamamelidaceae), 12.VII.2008, leg. Sh. Mortazavi; Rasht, Kuchesfahan, 0,91 m a.s.l, soil under Grape: *Vitis vinifera* LINNAEUS (Vitaceae), 27.VII.2008, leg. Sh. Mortazavi.

Distribution: Holarctic region and Iran (SUBIAS 2004, HADDAD IRANI-NEJAD et al. 2003).

***Microppia minus* (PAOLI 1908)**

M a t e r i a l : Rasht, Saravan forest, 97 m a.s.l, soil under Evangelic (*P. persica*), 5.V.2009, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Cosmopolitan, Iran (HADDAD IRANI-NEJAD et al. 2003; SUBIAS 2004).

***Lauroppia iranica* AKRAMI & SUBIAS 2008**

M a t e r i a l : Rasht, Ahmadgoorab, -0,6 m a.s.l, soil under Spruce (*P. deltoids*), 31.VIII.2008, leg. Sh. Mortazavi; Rasht, Mellat park, -4,2 m a.s.l, soil under Maple: *Acer palmatum* THUNB. (Sapindaceae), 24.VIII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Iran (AKRAMI & SUBIAS 2008b).

***Oppiella (Oppiella) nova nova* (OUDEMANS 1902)**

M a t e r i a l : Rasht, Ahmadgoorab, -0,6 m a.s.l, soil under Walnut: *Juglans regia* L. (Juglandaceae), 31.VIII.2008, leg. Sh. Mortazavi; Rasht, Agha sed sharif, 35 m a.s.l, soil under Tea: *Camellia sinensis* L. (Theaceae), 7.IX.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Cosmopolitan (NORTON & BEHAN-PELLETIER 2009).

***Oppiella (Oppiella) nova mazandaranica* AKRAMI & SUBIAS 2009**

M a t e r i a l : Rasht, Pasikhan, -0,61 m a.s.l, soil under Black berry: *Morus alba* LINNAEUS (Moraceae), 20.V.2009, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Iran (AKRAMI & SUBIAS 2009).

***Anomaloppia mazandaranica* AKRAMI & SUBIAS 2007**

M a t e r i a l : Rasht, Sangar, 27 m a.s.l, soil under Rice (*O. sativa*), 27.VII.2008, leg. Sh. Mortazavi; Rasht, Ahmadgoorab, -0,6 m a.s.l, soil under Spruce (*P. deltoids*), 31.VIII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Iran (AKRAMI & SUBIAS 2007b).

***Multioppia (Multioppia) laniseta* MORITZ 1966**

M a t e r i a l : Rasht, Saravan forest, 97 m a.s.l, soil under Elm (*U. minor*), 12.VII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Palearctic region: Iran, UAS (SUBIAS 2004 AKRAMI & SUBIAS 2007a).

***Ramusella (Ramusella) puertomontensis* HAMMER 1962**

M a t e r i a l : Rasht, Saravan forest, 97 m a.s.l, soil under Evangelic (*P. persica*), 12.VII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Cosmopolitan (SUBIAS 2004).

***Ramusella (Ramusella) sengbuschi* s.str. HAMMER 1968**

M a t e r i a l : Rasht, Mellat park, -4,2 m a.s.l, soil under Maple (*A. palmatum*), 14.VIII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Pantropical and subtropical regions (SUBIAS 2004).

P r o t o r i b a t i d a e J. BALOGH et P. BALOGH 1984

Ptororibates (Protoribates) paracapusinus MAHUNKA 1988

M a t e r i a l : Rasht, Khomam, -60 m a.s.l, soil under Elm (*U. minor*), 14.VIII.2008, leg. Sh. Mortazavi; Rasht, Saravan forest, 97 m a.s.l, soil under Pine (*P. silvestris*), 30.X.2008, leg. Sh. Mortazavi; Rasht, Sangar, 27 m a.s.l, soil under Spruce (*P. deltoids*) and Pomegranate: *Punica granatum* LINNAEUS (Punicaceae), 27.VII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Maleizya and Iran (BAYARTOGTOKH & AKRAMI 2000b).

Protoribates (Triaungius) obtusus (MIHELICIC 1956)

M a t e r i a l : Rasht city, Guilan University, 25 m a.s.l, soil under Rice (*O. sativa*), 29.IV.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Spain and Iran (BAYARTOGTOKH & AKRAMI 2000b).

Brasilobates bipilis PERES-INIGO & BAGGIO 1980

M a t e r i a l : Rasht, Sangar, 27 m a.s.l, soil under Rice (*O. sativa*), 27.VII.2008, leg. Sh. Mortazavi, Rasht, Kucheshahan, 0,91 m a.s.l, soil under Spruce (*P. deltoids*), 27.VII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Brazil and Iran (PEREZ-INIGO & BAGGIO 1980, AKRAMI 2008c).

O r i b a t u l i d a e THOR 1929

Oribatula (Oribatula) pallida BANKS 1906

M a t e r i a l : Rasht, Sangar, 27 m a.s.l, soil under Spruce (*P. deltoids*), 27.VII.2008, leg. Sh. Mortazavi; Rasht, Kucheshahan, 0,91 m a.s.l, soil under Pomegranate (*P. granatum*), 27.VII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : North America, Mongolia and Iran (BANKS 1906, BAYARTOGTOKH & AOKI 1998, AKRAMI et al. 2008).

Oribatula (Oribatula) tibialis allifera SUBIAS 2000

M a t e r i a l : Rasht, Saravan forest, 97 m a.s.l, soil under Oak (*Q. castaneifera*), 12.VII.2008, leg. Sh. Mortazavi; Rasht, Falakdeh, 26 m a.s.l, soil under Elm (*U. minor*), 20.VII.2008, leg. Sh. Mortazavi; Sangar, 27 m a.s.l, soil under Spruce (*P. deltoids*) and Walnut (*J. regia*), 30.X.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : South Europe and Iran (SUBIAS 2004, AKRAMI et al. 2008).

Oribatula (Oribatula) tibialis tibialis (NICOLET 1855)

M a t e r i a l : Rasht, Ahmadgoorab, -0,6 m a.s.l, soil under Walnut (*J. regia*), 31.VIII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Holarctic region, Mongolia and Iran (BAYARTOGTOKH & AOKI 1998; SUBIAS 2004, AKRAMI et al. 2008).

***Oribatula (Zygoribatula) undulata* BERLESE 1916**

M a t e r i a l : Rasht city, Guilan University, 25 m a.s.l, soil under Sour cherry: *Prunus cerasus* L. (Rosaceae), 14.V.2008, leg. Sh. Mortazavi; Rasht, Khomam, -60 m a.s.l, soil under Spruce (*P. deltoids*) and Rice (*O. sativa*), 14.VIII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Pantropical and subtropical regions, South Africa and Iran (GROBLER & KOK 1993, HADDAD IRANI-NEJAD et al. 2003, SUBIAS 2004).

***Oribatula (Zygoribatula) exarata* BERLESE 1916**

M a t e r i a l : Rasht city, Guilan University, 25 m a.s.l, soil under Spruce (*P. deltoids*), 14.V.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Palearctic region, Iran (SUBIAS 2004, AKRAMI et al. 2008).

S c h e l o r i b a t i d a e GRANDJEAN 1953

***Schelorbates fimbriatus* THOR 1930**

M a t e r i a l : Rasht city, Guilan University, 25 m a.s.l, soil under Spruce (*P. deltoids*), 14.V.2008, leg. Sh. Mortazavi; Rasht, Saravan forest, 97 m a.s.l, soil under Oak (*Q. castaneifera*) and Pine (*P. silvestris*), 7.V.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Russia, Ukraine, Iran and Fiji (BAYARTOGTOKH & AKRAMI 2000b).

***Schelorbates praeincisus* (BERLESE 1910)**

M a t e r i a l : Rasht city, Guilan University, 25 m a.s.l, soil under Rice (*O. sativa*), 29.IV.2008, leg. Sh. Mortazavi; Rasht, Khomam, -60 m a.s.l, soil under Elm (*U. minor*) and Rice (*O. sativa*), 14.VIII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Philippine, Indonesia, Iran and Fiji (BAYARTOGTOKH & AKRAMI 2000b).

C h a m o b a t i d a e GRANDJEAN 1954

***Chamobates (Xiphobates) sergienkae* SHALDYBINA 1980**

M a t e r i a l : Rasht, Saravan forest, 97 m a.s.l, soil under Evangelic (*P. persica*), 12.VII.2008, leg. Sh. Mortazavi; Rasht, Agha sed sharif, 35 m a.s.l, soil under Tea (*C. sinensis*), 7.IX.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Ukraine and Iran (SHALDYBINA 1980, AKRAMI 2008c).

C e r a t o z e t i d a e JACOT 1925

***Ceratozetella sellnicki* (RAJSKI 1958)**

M a t e r i a l : Rasht city, Guilan University, 25 m a.s.l, soil under Peach: *Prunus persica* L.Batsch (Rosaceae), 7.V.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Poland and Iran (RAJSKI 1958, AKRAMI 2008c).

Mycobatiidae GRANDJEAN 1954

***Punctoribates liber* PAVLITSHENKO 1991**

M a t e r i a l : Rasht city, Guilan University, 25 m a.s.l, soil under Hock: *Althaea officinalis* L. (Malvaceae), 14.V.2008, leg. Sh. Mortazavi; Rasht, Saravan forest, 97 m a.s.l, soil under Oak (*Q. castaneifera*) and Elm (*U. minor*), 12.VII.2008, leg. Sh. Mortazavi; Rasht, Imamzade Hashem, 103 m a.s.l, soil under Pomegranate (*P. granatum*), 30.X.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Ukraine and Iran (SUBIAS 2004, AKRAMI 2008c).

Phenopelopiidae PETRUNKEVITCH 1955

***Eupelops acromios* (HERMAN 1804)**

M a t e r i a l : Rasht, Saravan forest, 97 m a.s.l, soil under Elm (*U. minor*), 12.VII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : South Africa and Iran (SUBIAS 2004, AKRAMI et al. 2008).

Galumnidae JACOT 1925

***Galumna divergens* MAHUNKA 1995**

This species is new record for Iran fauna.

M a t e r i a l : Rasht city, Guilan University, 25 m a.s.l, soil under Sour cherry (*P. cerasus*), 7.V.2008, leg. Sh. Mortazavi; Rasht, Agha sed sharif, 35 m a.s.l, soil under Evangelic (*P. persica*), 20.VII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : Indonesia (SUBIAS 2004).

***Galumna dimidiata* ENGELBRECHT 1969**

M a t e r i a l : Rasht city, Guilan University, 25 m a.s.l, soil under Rice (*O. sativa*), 29.IV.2008, leg. Sh. Mortazavi; Rasht, Falakdeh, 26 m a.s.l, soil under Oak (*Q. castaneifera*), 20.VII.2008, leg. Sh. Mortazavi.

D i s t r i b u t i o n : South Africa and Iran (ENGELBRECHT 1969, KHERADPIR et al. 2007).

Zusammenfassung

Faunistische Studien an cryptostigmatischen Milben in der nordöstlichen iranischen Provinz Guilan im Zeitraum 2008-2009 ergaben 32 Arten aus 16 Familien der Brachypiline (Acari: Oribatida: Brachypylina). Alle aufgelisteten Angaben stellen Erstnachweise für die Provinz Guilan dar, eine Art ist neu für den Iran.

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