NEW RECORDS OF TARSONEMID MITES FROM ALFALFA FIELDS IN NORTHWEST OF EAST AZERBAIJAN PROVINCE, IRAN (ACARI)

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[Lotfollahi, P. & Irani-Nejad, K. H. 2010. New records of tarsonemid mites from alfalfa fields in northwest of east Azerbaijan province, Iran (Acari). Munis Entomology & Zoology, 5 (2): 538-542**]**

ABSTRACT: In order to study the tarsonemid soil mite fauna of alfalfa fields in Northwest of East Azarbaijan province including Soofian, Payam, Zenooz, Marand, Shabestar and Jolfa, soil samples were taken at three different times of the year 2006 (mid-May, mid-July and mid-September). Tarsonemid mites were seperated and identified. In this study 3 genera (*Tarsonemus*, *Steneotarsonemus* and *Neotarsonemoides*) and 10 species (*Steneotarsonemus acuticlavus* Wainstein, 1979*, *Steneotarsonemus arcuatus* Livshitz, Mitrofanov & Sharonov, 1979*, *Tarsonemus waitei* Banks, 1912**, *Tarsonemus mixtus* Kaliszewski, 1993*, *Tarsonemus fusarii* Cooreman, 1941, *Tarsonemus intextus* Kaliszewski, 1993*, *Tarsonemus annotatus* Livshitz, Mitrofanov & Sharonov, 1979*, *Tarsonemus bilobatus* Suski, 1965**, *Tarsonemus limitatus* Kaliszewski, 1993*, *Neotarsonemoides* lucifer* (Schaarschmidt, 1959)*) were identified, of which 1 genera and 7 species are new records for mite fauna of Iran and 1 genera and 9 species are new records for mite fauna of East Azerbaijan that indicated with * and ** respectively.

KEY WORDS: Alfalfa, East Azerbaijan, Iran, new record, Tarsonemidae.

The family Tarsonemidae belongs to the superfamily Tarsonemoidea. The family name was first proposed by Canestrini and Fanzago(1877) and also by Kramer(1877) simultaneously, but Canestrini and Fanzago gives its main profile. Tarsonemidae comprises a relatively highly derived group of mites having a greater diversity of feeding habits than any other family of acari. These mites have a variety of feeding habits, including mycophagy, phytophagy, and parasitic/symbiont associates of insects. Having such diversity of habits cause to a comparable difference in body structure, including form of mouthparts and specialization of tactile organs, particularly setae of the body and legs (Lindquist, 1986). Phytophagus species feed on leaves, flowers, fruits and soft stems (Ochoa et al., 1991) that some of them are important pests of agricultural crops. Although some species are predator (Smiley & Landwehr, 1976; Lindquist & Smiley, 1978). This family comprises more than 529 described species belonging to 40 genera worldwide (Lin & Zhang, 2002). Members of this family have been reported from parts of the world except Antarctic, large deserts and water habitats (Lindquist, 1986). Iran records for this family are scarce (Sepasgozarian, 1977; Bahreini, 1993; Sorush, 1994; Faraji & Kamali, 1993; Khanjani, 1996; Mirjamali et al., 2008; Hajiqanbar, 2009). In this paper we studied on tarsonemid soil mite fauna of alfalfa fields in northwest of East Azerbaijan province, Iran.

MATERIALS AND METHODS

Tarsonemid soil mite fauna of alfalfa fields of six regions in Northwest of East Azabaijan (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 & Cochran, 1967). In this study, three fields in each region and three samples in each field were selected and sampling of them were conducted at three different times. Maximum depth for sampling was 25 cm of soil. Specimens were transferred to the acarological laboratory of Plant Protection Department, Faculty of Agriculture, University of Tabriz and mites of them were extracted using the Berlese funnel. Mites were cleared by using clearing solution (Lactoglyserin and nesbit) (Krantz, 1978). Cleared mites were slide mounted in Hoyer's medium. Generic and specific identifications were made by the authors with a phase contrast microscope (Olympus, BX41). The type specimens are held in the Acarological Collection, Department of Plant Protection, Faculty of Agriculture, University of Tabriz, Tabriz, Iran.

RESULTS

In this study 54 soil samples were taken at three different times of year 2006, which results in collecting and identification of 3 genera and 10 species; of which 1 genus and 7 species are new records for mite fauna of Iran and 1 genus and 9 species are new records for mite fauna of East Azerbaijan province.

Genus *Steneotarsonemus* Beer, 1954

Steneotarsonemus acuticlavus Wainstein, 1979

Materials examined and associations: 2 specimens, Jolfa, mid-September 2006.
Previous provincial records for Iran: There is no provincial record of this species in Iran.
Comments: This is the first record of *S. acuticlavus* in Iran.

Steneotarsonemus arcuatus Livshitz, Mitrofanov & Sharonov, 1979

Materials examined and associations: 1 specimen, Soofian, mid-September 2006; 4 specimens, Zenooz, mid-September 2006; 1 specimen, Shabestar, mid-September 2006.
Previous provincial records for Iran: There is no provincial record of this species in Iran.
Comments: This is the first record of *S. arcuatus* in Iran.

Genus *Tarsonemus* Canestrini & Fanzago, 1876

Tarsonemus waitei Banks, 1912

Materials examined and associations: 2 specimens, Soofian, mid-September 2006.
Previous provincial records for Iran: Markazi (Sorush, 1994); Tehran (Ostovan & Kamali, 1997; Mirjamali et al. 2008).
Comments: This is the forth and first record of *T. waitei* in Iran and East Azerbaijan province, respectively.

Tarsonemus mixtus Kaliszewski, 1993

Materials examined and associations: 2 specimens, Soofian, mid-September 2006; 1 specimen, Shabestar, mid-September 2006.
Previous provincial records for Iran: There is no provincial record of this species in Iran.
Comments: This is the first record of *T. mixtus* in Iran.

Tarsonemus fusarii Cooreman, 1941

Materials examined and associations: 4 specimens, Shabestar, mid-July and mid-September 2006.
Previous provincial records for Iran: Hamedan (Khanjani, 1996); Mazandaran (Faraji & Kamali, 1993); Khorasan (Hagiqanbar, 2009); East Azerbaijan (Lotfollahi & Haddad, 2010).
Comments: This is the fifth and second record of *T. fusarii* in Iran and East Azerbaijan province, respectively.

***Tarsonemus intextus* Kaliszewski, 1993**
Materials examined and associations: 2 specimens, Soofian, mid-September 2006.
Previous provincial records for Iran: There is no provincial record of this species in Iran.
Comments: This is the first record of *T. intextus* in Iran.

***Tarsonemus annotatus* Livshitz, Mitrofanov & Sharonov, 1979**
Materials examined and associations: 2 specimens, Soofian, mid-September 2006.
Previous provincial records for Iran: There is no provincial record of this species in Iran.
Comments: This is the first record of *T. annotatus* in Iran.

***Tarsonemus bilobatus* Suski, 1965**
Materials examined and associations: 5 specimens, Shabestar, mid-September 2006.
Previous provincial records for Iran: Mazandaran (Barimani-Varandi, 1996; Barimani-Varandi & Kamali, 1998); Tehran (Mirjamali et al. 2008).
Comments: This is the forth and first record of *T. bilobatus* in Iran and East Azerbaijan province, respectively.

***Tarsonemus limitatus* Kaliszewski, 1993**
Materials examined and associations: 1 specimen, Soofian, mid-July 2006; 1 specimen, Marand, mid-May, 2006; 1 specimen, Zenooz, mid-September 2006.
Previous provincial records for Iran: There is no provincial record of this species in Iran.
Comments: This is the first record of *T. limitatus* in Iran.

Genus *Neotarsonemoides* Kaliszewski, 1986

***Neotarsonemoides lucifer* (Schaarschmidt, 1959)**
Materials examined and associations: 3 specimens, Soofian, mid-September 2006.
Previous provincial records for Iran: There is no provincial record of this genus in Iran.
Comments: This is the first record of *N. lucifer* in Iran.

DISCUSSION

Distribution of this family during three different sampling times showed increasing trend from mid-May to mid-September. This process may show that members of family Tarsonemidae are termophilic.

Maximum number of tarsonemid mites was obtained in Shabestar at mid-September. In general, the number of mites from high to low were in Shabestar, Soofian, Zenooz, Jolfa and Marand, respectively. Maximum species diversity of this family was obtained in Soofian at mid-September and the number of species(species diversity) from high to low were in Soofian, Shabestar, Zenooz, Jolfa and Marand, respectively. No tarsonemid mite was observed in payam.

Increasing the diversity and frequency of collected mites from mid-May to mid-September shows the dependence of species diversity and frequency to climate condition specially high temperature and low humidity, which have been shown in Bedano et al. (2005), Toros and Emekci (1989), Fathi Poor (1994) and Ardashir (2004).

ACKNOWLEGEMENTS

This project was supported by the research division of Tabriz University, Iran, which is greatly appreciated. Also the authors are grateful to Dr. Magowski (Poland) who helped in confirmation or identification of some specimens.

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