

## Six New Records of Predaceous Mites Associated with some Trees from Riyadh, Saudi Arabia

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### ABSTRACT

Ten predaceous mite species, belonging to eight families (Ascidae, Bdellidae, Caligonellidae, Camerobiidae, Cheyletidae, Cunaxidae, Phytoseiidae and Stigmaeidae), were collected from fruit and timber trees in Riyadh, Saudi Arabia. Out of these ten species, six (*Arctoseius cetratus* (Sellnick), *Decaphyllobius gersoni* Bolland, *Molothrognathus* sp., *Neoseiulus barkeri* Hughes, *Neoseiulus mumae* (Shehata & Zaher), and *Scutascirus tactus* Chaudhari) are firstly recorded in Saudi Arabia. In addition, *Agistemus vulgaris* Soliman & Gomaa, *Euseius scutalis* (Athias-Henriot), and *Spinibdella bifurcata* Atyeo are reported for the first time on fruit trees in Saudi Arabia, while *Hemicheyletia bakeri* (Ehara) was previously recorded on pin timber trees. Some of these predaceous mites, recorded in this study, can be used as biological agents against phytophagous mites in Saudi Arabia.

**Key Words:** Phytoseiidae, Predaceous mites, Fruit Crops, Saudi Arabia.

### INTRODUCTION

The predaceous mites play an important role in suppressing other mite pests in different habitats attacking different plant hosts (Amitai, 1992). Different mite families including potentially important predaceous species are found throughout the world on plants and soils. Members of phytoseiid and stigmaeid mites are very essential biological control agents for mite pests, e.g. tetranychids, tenuipalpids and eriophyids (Helle & Sabelis, 1985; Santos & Laing 1985; Villanueva & Harmsen, 1998 and Kheradmand *et al.*, 2007).

Mite fauna of Saudi Arabia (SA) has received a very little consideration and the groundwork for essential taxonomic, biological, and ecological studies of agricultural mites is extremely rare (Al-Atawi & Halawa, 2011 and Al-Shammery, 2009). Consequently, predatory mites have been poorly studied in SA resulting in insufficient information about the biology and ecology of these beneficial mites. Such information is highly required for successful integrated pest management (IPM), biological control, and organic farming programs.

However, out of 88 predatory mite species, belonging to 59 genera and 25 families, reported on different plants and soil in SA, only 25 species were recorded on fruit trees (Al-Youssif, & Soliman, 1979; Soliman & Al-Yousif, 1979; Hammad *et al.*, 1981; Dabbour & Abdel-Aziz, 1982; Al-Khalifa & Bayoumi, 1983; Bayoumi & Al-Khalifa, 1983; Rostom, 1993; Al-Ahmed, 2000; Al-Rehiyani & Fouly, 2005 & 2006; Al-Shammery, 2009, Fouly & Al-Rehiyani, 2011 and Al-Atawi, 2011). This study aimed to investigate predatory mites associated with some fruit and timber trees in Riyadh, Saudi Arabia.

### MATERIALS AND METHODS

A survey of mite collection from fruit and timber trees was conducted in five localities surrounding Riyadh city (Al-Deraiya, Al-Ammaria, Al-Hayer, Al-Oiayna and Al-Waseel). The fruit trees included vine (*Vitis vinifera*), citrus (*Citrus* spp.), apple (*Malus domestica*) and date palm (*Phoenix dactylifera*). Only one species of timber trees was surveyed (*Tamarix aphylla*). During the time of mite collection, tumors were observed on bark of *Tamarix aphylla*. At each locality, sampling process was carried out irregularly from October, 2008 to December, 2010. Samples included plant foliages and surface soil surrounding the trees.

Mites were collected from leaves and soil samples by using a fine hair brush for identification based on Krantz (1978), Atyeo (1960), Evans (1963), Smiley (1992), and Zhi-Qiang Zhang (2003). All specimens are deposited in the King Saud University Museum of Arthropod (KSMA), College of Food and Agriculture Sciences, King Saud University.

### RESULTS AND DISCUSSION

#### 1- Mesostigmata:

##### Family Ascidae Voigots and Oudemans

*Arctoseius cetratus* (Sellnick)

**Material examined:** Al-Ammaria, XI. III. 2009.

1 ♀ in citrus groove soil (*Citrus* spp.).

##### Family Phytoseiidae Berlese

*Neoseiulus barkeri* Hughes

**Material examined:** Al-Hayer, XXIII. IV. 2009.

2 ♀ on leaves of apple (*Malus domestica*).

*Neoseiulus mumae* (Shehata and Zaher, 1969)

(= *Amblyseius mumae* Shehata and Zaher, 1969)

**Material examined:** Al-Oiayna, 15.V. 2009.

2 ♀ in citrus groove soil (*Citrus* spp.).

*Euseius scutalis* (Athias- Henriot).

**Material examined:** Al-Hayer, 22. X. 2009.

1 ♀ 1 ♂ on leaves of grape vine (*Vitis vinifera*).

## 2- Prostigmata:

**Family Bdellidae** Duges

*Spinibdella bifurcata* Atyeo

**Material examined:** Al-Deraiya, VII. VI. 2009.

1 ♀ on fronds of date palm (*Phoenix dactylifera*).

**Family Caligonellidae** Grandjean

*Molothrognathus* sp.

**Material examined:** Al-Wassel, XXV. XII.2010,

9 ♀ on *Tamarix aphylla* leaves (Tamaricaceae)

**Family Camerobiidae** Southcott

*Decaphyllobius gersoni* Bolland

**Material examined:** Al-Wassel, XXV. XII.2010,

8 ♀ 2 ♂ on *Tamarix aphylla* leaves (Tamaricaceae)

**Family Cheyletidae** Leach

*Hemicheyletia bakeri* (Ehara)

**Material examined:** Al-Wassel, XXV. XII.2010,

3 ♀ in *Tamarix aphylla* (Tamaricaceae)

**Family: Cunaxidae** Thor

*Scutascirus tactus* Chaudhari

**Material examined:** Al-Hayer, XVIII. III. 2009,

1 ♀ in citrus groove soil (*Citrus* spp.).

**Family: Stigmaeidae** Oudemans

*Agistemus vulgaris* Soliman and Gomaa

**Material examined:** Al-Hayer, XVIII. XII. 2008,

1 ♀, 1 ♂ on leaves of grape vine (*Vitis vinifera*).

Ten mesostigmatid and prostigmatid predatory mite species belonging to ten genera and eight families (Ascidae, Bdellidae, Caligonellidae, Camerobiidae, Cheyletidae, Cunaxidae, Phytoseiidae, and Stigmaeidae) were collected from five species of trees covering five different localities (Al-Deraiya, Al-Ammaria, Al-Hayer, Al-Oiayna, Al-Waseel) in Riyadh. Seven species were recorded on four fruit trees (*Citrus* spp., *Malus domestica*, *Phoenix dactylifera*, *Vitis vinifera*), while the other three mite species were found on (*Tamarix aphylla*).

Six mite species, namely *A. cetratus*, *D. gersoni*, *Molothrognathus* sp., *N. mumae*, *N. barkeri*, and *S. tactus* are recorded for the first time in SA, whereas *A. vulgaris*, *E. scutalis*, and *S. bifurcata* Atyeo are noted for the first time on fruit trees in Saudi Arabia. The last three species were previously recorded on different plants other than fruit trees (*Lettuce sativa*, *Solanum melongena*, and *Pinus* spp.) (Al-Atawi, 2011, Al-Shammery, 2009, Al-Khalifa and Bayoumi, 1983), respectively. *Hemicheyletia bakeri* (Ehara) was earlier recorded on pin timber trees (*Pinus* spp.) (Al-Youssif and Soliman, 1979).

Among mesostigmatid species recorded in this study, the two phytoseiid mites, *N. barkeri* and *E. scutalis* play important role in biological control and

pest management programs (McMurtry, 1997). The applications of *E. scutalis* and *N. barkeri* against greenhouse whiteflies (*Bemisia tabaci* Gennadius) and phytophagous mite (*Polyphagotarsonemus latus* (Banks)) were proposed by Nomikou *et al.*, 2002 and Urigeron & Phyllis, 2007 respectively. However, *N. mumae* has not been used yet as a biological control agent in pest management programs. This species was only recorded in Egypt and attacks *T. urticae* and scale insects (Shehata and Zaher, 1969).

None of prostigmatid species recorded in this study has been previously applied in biological control and pest management programs. Yet, the genus *Agistemus* Summers is one of the most important spider mites predators (Santos and Laing 1985; Kheradmand *et al.*, 2007). *Agistemus vulgaris* was originally described in Egypt and preys on phytophagous mites (Zaher, *et al.*, 1986). This mite is well distributed in different areas in Riyadh (Al-atawi, 2011).

In Saudi Arabia, among these four mite species previously recorded (*A. vulgaris*, *E. scutalis*, *S. bifurcata*, and *H. bakeri*) and reported in this study, only *E. scutalis* was evaluated as a biological control agent against three phytophagous tetranychid (*T. urticae*, *Eutetranychus orientalis* Klein, and *Oligonychus afrasiaticus* McGregor) under laboratory conditions (Al-Shammery, 2009). Therefore, further research should focus on these predatory mites as biocontrol agents. These results can be used to improve IPM programs by using the local natural enemies in controlling local or invasive pests in SA.

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