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THE MESOSTIGMATID FAUNA OCCURRING ON SOME PLANTS AT SHARKIA GOVERNORATE, EGYPT

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ABSTRACT : A study for the mesostigmatid fauna occurring on nine plant species especially those growing in or around water streams at four sites in Sharkia Governorate, Egypt was carried out. Twenty seven species were recorded belonging to 16 genera and 8 families. These species were: *Parasitus consanguineus, P. badryi* and *Vulgarogamasus burchanensis* (Parasitidae); *Arctoseius bilinear, A. cetratus, Lasioseius lindquisti, L. peritremus, Protogamasellus minutus* and *Gamasellodes bicolor* (Ascidae); *Amblyseius swirski, A. zaheri, A. badryi, A. lindquisti, A. cydnodactylon, Typhlodromus siwa, T. zaheri, T.pyri* and *Paratyphlodromus reticulatus* (Phytoseiidae); *Androlaelaps zaheri, A. reticulatus, Hypoaspis koseii* and *H. arabicus* (Laelapidae); *Uroobovella krantzi* and *Urodinychus pilosus* (Uropodidae); *Ameroseius aegyptiacus* (Ameroseiidae); *Macrocheles merdarius* (Macrochelidae) and *Rhodacarus roseus* (Rhodacaridae).

KEY WORDS : Gamasida, Mesostigmata, Phytoseiidae, Aquatic plants, Waterhyacinth, Weeds.

INTRODUCTION

Mesostigmatid species adapted themselves to a wide variety of habitats. They are often predatory and form an important part of the fauna dwelling surface litter of soils. Holm *et al.*, (1977) reported that of the approximately 250,000 known plant species, fewer than 250 have become economically

important weeds of the world. Some species of these plants grow in the water either as aquatic plants (floating or submerged) or growing around water streams. The economic importance of these weeds were determined by a number of factors such as plant compotition, geographical area, significance as alternate host for either pests or predators and parasites, and so on (Cromroy, 1983). These plants are considered as hosts or alternative hosts for agricultural pests. Also, they provide a habitat which favors the development of vectors of human disorders (Gangstad, 1990). Some of these plants such as waterhyacinth, *Eichhornia crassipes* (Mart.) Solms. is widely distributed and has been recognized as a notorious weed of the inland waters of tropical and subtropical regions (Timmons, 1970).

Pesticides often disrupts populations of the predatory mites and caused disturbances to the ecosystem in addition to their toxic residues. Moreover, pesticides account outbreak of spider mites after their application to control pests (Walter and Proctor, 1999); so producing a balance between predatory and plant parasitic mites in agricultural systems is one of the goals of Integrated Pest Management (IPM). Most of 1700 species of mites have been described since World War II as a direct result of their importance as biological control agents (Chant, 1993 and Kostiainen and Hoy, 1996).

Therefore, the objectives of this work are considered as a preliminary trial to throw a light on the mesostigmatid fauna that most of them are active biocontrol agents and associated with some plants growing in and around water streams in four sites at Sharkia Governorate, Egypt.

MATERIALS AND METHODS

A survey on mesostigmatid fauna associated with nine plants growing in and around water streams at four sites namely, Zagazig, Abo-Kabeer, Abo-Hammad and Hehia were conducted during 2001 at Sharkia Governorate, Egypt. These plants were : waterhyacinth, *Eichhornia crassipes* (Mart.) Solms.; azolla, *Azolla* spp.; smartweed, *Polygonum salicifolium* Brouss.; common coontail, *Ceratophyllum demersum* L.; common reed,

Phragmites australis Trin,; matsedge, *Cyperus alopecuroides* Rottb.; nutsedge, *Cyperus longus* L.; wildment, *Mentha sylvestris* L. and cogongrass, *Imperata cylindrica Beauv.*. The samples were transferred to the laboratory following the technique used by Singh *et al.*, (1989). Leaves were examined under a stereoscopic binocular microscope immediately after their collection, while the root portions of some plant species and the previously inspected leaves were cut into pieces and kept separately in Tullgren's funnel for 24 hours for extraction of mites. The mite individuals were collected in water. For identification and taxonomic studies, mites were transferred to lactophenol clearing which was prepared by mixing lactic acid (50 parts), phenol crystals (25 parts) and distilled water (925 parts) in sequence (Krantz, 1978). The cleared spesimens were mounted directly in Hoyer's medium (Krantz, 1970).

RESULTS AND DISCUSSION

The survey revealed the occurrence of twenty seven species of predatory mites belonging to 16 genera and 8 families, (Table 1). The results cleared that the family Phytoseiidae recorded the highest number of the mite species, while the lowest number of mite represented by Rhodacaridae, Macrochelidae and Ameroseiidae. The predatory mite species associated with waterhyacinth, *Eichhornia crassipes* were higher in number than those inhabiting other plant species. The six families i.e., Parasitidae, Ascidae, Phytoseiidae, Laelapidae, Uropodidae and Ameroseiidae were recorded to inhabit that host.

Several investigators, Sheela and Haq, (1989); Kandeel *et al.*, (1994); Sumangala and Haq, (1995) and Fan QingHai, (1997) collected the mite species inhabiting waterhyacinth, *Eichhornia crassipes*.

The species associated with *Azolla* sp. were belonging to the four families, Parasitidae, Ascidae, Phytoseiidae and Macrochelidae. In Philippines, Calilung and Lit, (1986) recorded six pest species and several predators associated with *Azolla* spp.

The two species *Lasioseius lindquisti* (Ascidae) and *Amblyseius swirski* (Phytoseiidae) were recorded on *Polygonum salicifolium*. In (1956) Sheals,

observed *Lasioseius penicilliger* Berl. (Ascidae) in old grassland at Glasgow.

Five species belonging to three families (Ascidae, Phytoseiidae and Uropodidae) were associated with *Ceratophyllum demersum*. Phytoseiid mites only were observed to inhabit *Phragmites australis*, *Cyperus alopecuroides* and C. *longus*.

Walter *et al.*, (1994) and Walter and Proctor, (1998) showed that the different species of phytoseiid mites increase from temperate to tropical regions additional lineages of Mesostigmata (e.g. Ascidae, Uropodidae and Ologamasidae). In Australia, Walter *et al.*, (1993, 1994) and Walter and Lindquist, (1995) mentioned that the species *Lasioseius porulosus* group and *Asca foliata* group (both Ascidae) were more abundant on leaves than phytoseiid mites.

Four species belonging to the two families, Rhodacaridae and Phytoseiidae were recorded on *Mentha sylvestris*; while four species belonging to the two families Phytoseiidae and Laelapidae were associated with *Imperata cylindrica*.

El-Bishlawy, (1978) found that 41 phytophagous and predaceous mite species belonging three suborders, Prostigmata, Mesostigmata and Cryptostigmata inhabiting most weeds in Giza, Egypt. In Florida, Cromroy, (1983) compiled a list from number of catalogues which recorded the mites associated with 14 important weed species. In Egypt, Omar, (2000) studied the mite species associated with some plants growing in and around water streams; he recorded 69 mite species belonging to 50 genera, 27 families and 4 suborders. On the other hand, Pal and Singh, (1993) recorded the oribatid mites associated with some aquatic weeds in Varanasi region of Uttar Pradesh, India.

Table (1): Predatory mite species associated with some plants growing in and around water streams at four sites.

Host plants	Mite species	Sites
Waterhyacinth, *Eichhornia crassipes* (Mart.) Solms.	**Family : Parasitidae**	
	- *Vulgarogamasus burchanensis*	b
	- *Parasitus consanguineus*	b
	- *P. badryi*	a, b
	Family : Ascidae	
	- *Arctoseius bilinear*	a, b, c

Table (1) continued

	- *A. cetratus*	c
	- *Lasioseius lindquisti*	b
	Family : Phytoseiidae	
	- *Amblyseius swirski*	a, b
	- *A. cydnodactylon*	b
	- *A. lindquisti*	b
	Family : Laelapidae	
	- *Androlaelaps zaheri*	c, d
	- *Hypoaspis koseii*	b, d
	- *H. arabicus*	d
	Family : Uropodidae	
	- *Uroobovella krantzi*	b
	Family : Ameroseiidae	
	- *Ameroseius aegyptiacus*	b
Azolla, *Azolla* sp.	**Family : Parasitidae**	
	- *Vulgarogamasus burchanensis*	d
	Family : Ascidae	
	- *Gamasellodes bicolor*	a
	- *Protogamasellus minutus*	c
	- *Lasioseius lindquisti*	d
	- *L. peritremus*	d
	Family : Phytoseiidae	
	- *Amblyseius swirski*	a, b
	- *Paratyphlodromus reticulatus*	b
	Family : Macrochelidae	
	- *Macrocheles merdarius*	a, b
Smartweed, *Polygonum salicifolium* Brouss.	**Family : Ascidae**	
	- *Lasioseius lindquisti*	a, b, c
	Family : Phytoseiidae	
	- *Amblyseius swirski*	b
Common coontail, *Ceratophyllum demersum* L.	**Family : Ascidae**	
	- *Arctoseius bilinear*	a
	- *Protogamasellus minutus*	a, b, c
	Family : Phytoseiidae	
	- *Amblyseius swirski*	a
	- *Typhlodromus siwa*	a, d
	Family : Uropodidae	
	- *Urodinychus pilosus*	a, b, c
Common reed, *Phragmites australis* Trin.	**Family : Phytoseiidae**	
	- *Amblyseius swirski*	b
	- *A. zahri*	a
	- *Typhlodromus siwa*	a, b, d
	- *Paratyphlodromus reticulatus*	a, c, d

Table (1) continued

Matsedge, *Cyperus alopecuroides* Rottb.	**Family : Phytoseiidae**	
	- *Amblyseius swirski*	a, b
	- *A. badryi*	a, b
	- *A. cydnodactylon*	c
	- *A. zaheri*	a
	- *Typhlodromus siwa*	a
	- *T. zaheri*	a, c
	- *T. pyri*	a, b, c, d
	- *Paratyphlodromus reticulatus*	a, b, c
Nutsedge, *Cyperus longus* L.	**Family : Phytoseiidae**	
	- *Amblyseius swirski*	a, b
	- *A. zaheri*	a
	- *Typhlodromus siwa*	a, b
	- *Paratyphlodromus reticulatus*	a
Wildment, *Mentha sylvestris* L.	**Family : Rhodacaridae**	
	- *Rhodacarus roseus*	b
	Family : Phytoseiidae	
	- *Amblyseius swirski*	b, c
	- *Typhlodromus zaheri*	b
	- *T. siwa*	a, c, d
Cogongrass, *Imperata cylindrica* Beauv.	**Family : Phytoseiidae**	
	- *Typhlodromus siwa*	b, c, d
	- *T. pyri*	a
	- *Paratyphlodromus reticulatus*	c, d
	Family : Laelapidae	
	- *Androlaelaps reticulatus*	a, b

a = Zagazig b = Abo-Kabeer

c = Abo-Hammad d = Hehia

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حصر الفونا الاكاروسية من ذات الثغر المتوسط المتواجدة على بعض النباتات بمحافظة الشرقية – مصر

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أجريت هذه الدراسة لإلقاء الضوء على أنواع الحلم المفترسة من تحت رتبة ذات الثغر المتوسط المتواجدة على بعض النباتات التى تنمو فى المجارى المائية أو حولها فى أربع مناطق بمحافظة الشرقية هى : الزقازيق – أبو كبير – أبو حماد – ههيا. وقد أمكن حصر سبعة وعشرين نوعا من المفترسات الأكاروسية تنتمى إلى ستة عشر جنساً وثمانى عائلات كلها تابعة لتحت رتبة ذات الثغر المتوسط على نباتات : ياسنت الماء ، الازولا ، أبو ظلف المائى ، نخشوش الحوت ، الغاب ، السمار الحلو ، السعد ، حبق البحر والحلفا.

وكانت أنواع الحلم والعائلات التابعة لها على النحو التالى :

Parasitus consanguineus, P. badryi and *Vulgarogamasus burchanensis* (Parasitidae); *Arctoseius bilinear, A. cetratus, Lasioseius lindquisti, L. peritremus, Protogamasellus minutus* and *Gamasellodes bicolor (*Ascidae*); Amblyseius swirski, A. zaheri, A. badryi, A. lindquisti, A. cydnodactylon, Typhlodromus siwa, T. zaheri, T.pyri* and *Paratyphlodromus reticulatus* (Phytoseiidae); *Androlaelaps zaheri, A. reticulatus, Hypoaspis koseii* and *H. arabicus* (Laelapidae); *Uroobovella krantzi* and *Urodinychus pilosus* (Uropodidae); *Ameroseius aegyptiacus* (Ameroseiidae); *Macrocheles merdarius* (Macrochelidae) and *Rhodacarus roseus* (Rhodacaridae).