

**Ectoparasites (Feather Mites) on Wild Birds at Some Localities in Egypt****A. M. Metwally\***; **Wafaa F. Abd-Elhameed Ahmed\*\*** and **Noura, M. Barakat\*\***

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**ABSTRACT**

The present study was conducted for two years (2016-2018) to throw some light on the acarofauna feather bird mites (Arachnida: Acari: (Astigmata) of some wild birds in some Egypt governorates. The study revealed the presence of 30 species of feather bird mites, belonging to 9 families and one suborder (Astigmata) were collected from 21 species within 8 families. Mites were extracted using modified Tullgren funnel and mounted in Hoyer's medium on microscopic slides for examination. The parasitic feather mites detected in the present study included feather mites of families Alloptidae, Analgidae, Avenzoariidae, Proctophyllodidae, Pterolichidae, Trouessartiidae, Xolalgidae and Falcuferidae. The present study showed that wild birds in Egypt harbor various species of ectoparasitic feather mites.

**Key words:** Mites, Feather mites, Wild birds, A-stigmata.

**INTRODUCTION**

To date, the biodiversity of feather mites has been most thoroughly explored in Europe. Investigations have been carried out in more than 15 countries during the second half of the 20th century (for major references see Mironov, 1996, 1997). Recently, Proctor and Owens (2000) reviewed the role that mites play in the lives of birds. The best studied mites of birds are detrimental parasites. Among them, some astigmatid mites (suborder Astigmata, order Acariformes) seriously weaken their hosts by feeding on feather pith, tunnelling outwards through the feather, burrowing into the skin and other parts of feather follicles, and invading the lungs, tracheae and air sacs. Feather mites are a vast group of astigmatid mites that are permanent parasites or symbiotes of birds, and live on their plumage or skin. Feather mites are abundant on many different species of birds, but their biology is very poorly known. Feather mites in the superfamilies: Analgoidea, Freyanoidea and Pterolichoidea, are considered to be "true" feather mites (Proctor 2003).

Feather mites (Acari: Astigmata: Analgoidea, Pterolichoidea) are the most diverse groups of arthropods found on birds (Clayton *et al.*, 2010), with about 2,500 described species representing more than 30 families (Mironov and Proctor, 2011).

Villa *et al.*, (2013) found 8 genera of feather mites; the most prevalent genus was Mesalgoides (53–55%), followed by Trouessartia (40–45%), Amerodectes and Proctophyllodes (26–33%), Xolalgoides (21–27%), Analges and Strelkoviacarus (0–6%), and Dermoglyphus (2–4%). Fifteen feather mite taxa distributed into the families Analgidae, Proctophyllodidae, Psoroptoididae, Pteronyssidae, Xolalgidae, Trouessartiidae, Falcuferidae and Gabuciniidae Silva *et al.*, (2015). Rodrigues *et al.*, (2015) recorded 19 feather mite species belonging to

four families of the superfamily Analgoidea (Analgidae, Proctophyllodidae, Psoroptoididae and Trouessartiidae).

Faunistic studies about mites of birds in Egypt are limited. First reports of mites from Egyptian birds were published by Rakha (1980) for Astigmata and by Zaher (1986) for mites of various orders. Abd-Alla (1993) also provided taxonomic information about mites reported from wild birds. Sakr (2017) found feather mites include 32 species belonging to 15 families. To our knowledge, there is no taxonomic enough information source that contains the mite fauna of Egyptian birds that helps researchers find out what taxa have been reported to date and where they were found. To establish a baseline and enhance knowledge for further work on birds' mite fauna, this work presents data on the taxonomy and occurrence of feather bird mites (Astigmata) associated with wild birds in Egypt.

**MATERIALS AND METHODS**

Mites were collected from freshly killed birds from different locations in some Egypt governorates, during (2016 – 2018). Birds were trapped from different areas in and around Egypt. A total of 20 wild bird species (174 individuals) were examined. The wild birds were represented by Hoopoe (10); Senegal thick-knee (8); Spur-winged Plover (8); Palm dove (12); Rock Dove (10); Pied king fisher (6); Senegal coucal (8), Egyptian kestrel (5); Hooded Crow (12); White wagtail (5); House sparrow, (20); Swallow (12); Common bulbul (6); Cattle egret (20); Little egret (12); Black-crowned Night heron (5); Common Snipe (5); Little owl (5) and Black-winged Kite (5).

The plumage of the bird was thoroughly brushed by a fine camelhair brush onto a white tray for the collection of mites. The feathers of the head, the neck,

under the wings, body, legs and cloaca were collected from each bird and placed individually in modified Berlese funnels for 24 hours to collect the motile as well as quill mites into Petri dishes (Zumpt 1961). For collecting immotile or dead mites, a technique adapted from Lipovsky (1951) was used. Feathers were immersed in a beaker containing a detergent. The beaker was shaken for about 30 minutes, then the feathers were separated and the sedimented mites were isolated using a stereomicroscope. For permanent preparation, mites were cleared in lactic acid, washed in ethyl alcohol and mounted in Hoyer's medium (Krantz 1978). The cleared specimens were counted examined and identified by phase contrast microscope. Mites were identified to species using the keys given by Baker *et al.* (1956), Zumpt (1961), Fain (1965), Kethly (1970), Smiley (1970), Hughes (1976) and Krantz (1978).

## RESULTS AND DISCUSSION

Data in Table (1) revealed the presence of 34 feather mite species belonging to (15) genera under 8 families; these are belonging to one order and one suborder.

**A- Order Acariformes:** Acariformes was represented by one Sub-order (Acarididae).

**A-1- Suborder:** Acarididae was represented by eight families (Alloptidae, Trouessartiidae, Analgidae, Avenzoariidae, Proctophyllodidae, Pterolichidae, Xolalgidae Falcuferidae).

**Family Alloptidae:** This family was represented by three species *Alloptes limosae*, *Laminalloptes simplex* which collected from (*Bubulcus ibis ibis*, *Egretta garzetta garzetta*, *Gallinula chloropus* and *Hoplopterus spinosus*) with number from and *Laminalloptes minor* from (*Bubulcus ibis ibis*) only.

**Family Analgidae:** This family was represented by three species these species were *Analges* sp. from (*Centropus senegalensis aegyptius*, *Columbia livia*, *Passer domesticus niloticus*, *Pycnonotus barbatus*, *Streptopelia senegalensis aegyptiaca* and *Upupa epops major*); *Analges corvinus* from (*Corvus cornix sardonius* and *Passer domesticus niloticus*); *Analges passerinus* from (*Passer domesticus niloticus* and *Upupa epops major*); *Analges spiniger* from (*Passer domesticus niloticus*, *Centropus senegalensis aegyptius* and *Pycnonotus barbatus*); *Analges turdinus* from *Turdus merula*; *Megnina columbae* from (*Columbia livia* and *Streptopelia senegalensis aegyptiaca*); and *Temnalges* sp. from (*Centropus senegalensis aegyptius* and *Columbia livia*).

**Family Avenzoariidae:** This family was represented by six mite species, *Avenzoaria calidridis* and *Avenzoaria totani* were from (*Gallinago gallinago*); *Avenzoaria* sp. from (*Streptopelia senegalensis aegyptiaca*, *Columbia livia* and *Motacilla alba alba*); *Scutomegninia microfalcifera* from (*Hirundo rustica savignii*); *Zachkvatkinia turdinus* and *Zachkvatkinia* sp. from (*Burhinus senegalensis*, *Hoplopterus spinosus* and *Gallinago gallinago*).

**Family Proctophyllodidae:** This family was represented by eight mite species *Brephosceles forficiger* from (*Upupa epops major*) *Brephosceles* sp. from (*Ceryle rudis*) and *Brephosceles palagicus* from (*Hirundo rustica savignii*, *Bubulcus ibis ibis*, *Egretta garzetta garzetta* and *Nycticorax nycticorax nycticorax*); *Proctophyllodes* sp. from (*Upupa epops major*, *Streptopelia senegalensis aegyptiaca* *Columbia livia*, *Ceryle rudis* and *Passer domesticus niloticus*); *Proctophyllodes Sylvia* from (*Upupa epops major* and *Corvus cornix sardonius*); *Proctophyllodes truncatus*, *Brephosceles orientalis* from (*Upupa epops major* and *Passer domesticus niloticus*) *Proctophyllodes weigoldi* from (*Turdus merula*).

**Family Pterolichidae:** This family was represented by one mite species *Montchadskiana securicata* from (*Elanus coeruleus* and *Falco tinnunculus rupicolaeformis*).

**Family Trouessartiidae:** This family was represented by six mite species *Trouessartia* sp., from (*Corvus cornix sardonius* and *Passer domesticus niloticus*); *Trouessartia africana* from (*Corvus cornix sardonius*, *Hirundo rustica savignii*, *Passer domesticus niloticus*, and *Turdus merula*); *Trouessartia incise* from (*Corvus cornix sardonius*, *Passer domesticus niloticus* and *Turdus merula*) from *Trouessartia unicolor* from (*Corvus cornix sardonius*, *Motacilla alba alba*, *Passer domesticus niloticus* and *Turdus merula*) *Trouessartia eulobis* from (*Motacilla alba alba*) and *Trouessartia bifurcate* from (*Hirundo rustica savignii* and *Motacilla alba alba*).

**Family Xolalgidae:** This family was represented by two mite species *Xolalgoides palmai* from (*Falco tinnunculus rupicolaeformis*) and *Leptosphyra* sp. from (*Athene noctua glaux* and *Elanus coeruleus*).

**Family Falcuferidae:** This family was represented by one mite species *Byresalges talpacoti* from (*Columbia livia*).

Data revealed that; the highest infestation with avian mites was in House sparrow, *Passer domesticus niloticus* which infected with twelve mite species

Table (1): Feather bird mites of some wild bird species

Order: Acariformes Suborder: Acaridida	Mite Species	Bird Species	Abundance	Locality	
Family Alloptidae	<i>Alloptes limosae</i>	<i>Bubulcus ibis ibis</i>	**	Menia elkamh, Zifta-Tanta, Al-Zakazik, Belbees- Qotor	
		<i>Egretta garzetta garzetta</i>	**	Qotor- Tanta- Zifta	
	<i>Laminalloptes simplex</i> (Trouessart, 1885)	<i>Gallinula chloropus</i>	*	Menia elkamh, Alzakazik , Fakos, Tanta Menia elkamh- Tanta	
		<i>Hoplopterus spinosus</i>	*	Tanta, Al- Mahalla Alzakazik, Menia elkamh	
<i>Laminalloptes minor</i>	<i>Bubulcus ibis ibis</i>	**	Menia elkamh		
Family Trouessartiidae	<i>Trouessartia</i> sp. Gaud and Atyeo (1996)	<i>Corvus cornix sardonius</i>	***	Al- Santa, Belbis -Al- Mahalla- Qotor- Menia elkamh	
		<i>Passer domesticus niloticus</i>	***	Menia elkamh, Zifta-Tanta, Al-Zakazik, Belbees- Qotor	
	<i>Trouessartia africana</i> Till, 1954	<i>Corvus cornix sardonius</i>	***	Menia elkamh, Zifta-Tanta, Al-Zakazik, Belbees- Qotor	
		<i>Hirundo rustica savignii</i> <i>Passer domesticus niloticus</i> <i>Turdus merula</i>	*	Tanta, Zifta, Qotor	
	<i>Trouessartia bifurcata</i> (Trouessart, 1884)	<i>Hirundo rustica savignii</i>	***	Menia elkamh, Alzakazik , Fakos, Tanta	
		<i>Motacilla alba alba</i>	***	Menia elkamh, Fakos, Tanta	
	<i>Trouessartia eulobis</i> Buchhdz, 1869	<i>Motacilla alba alba</i>	***	Menia elkamh, Fakos, Tanta	
		<i>Trouessartia incisa</i> Gaud, 1957	<i>Corvus cornix sardonius</i> <i>Passer domesticus niloticus</i> <i>Turdus merula</i>	***	Menia elkamh, Fakos, Tanta, Al-Santa, Zifta
	<i>Trouessartia unicolor</i> Berla, 1959		<i>Corvus cornix sardonius</i> <i>Motacilla alba alba</i> <i>Passer domesticus niloticus</i> <i>Turdus merula</i>	*	Tanta, Zifta, Al- Santa
	Family Analgidae	<i>Analges corvinus</i>	<i>Corvus cornix sardonius</i>	****	Menia elkamh, Fakos, Tanta, Al-Santa, Qotor
<i>Passer domesticus niloticus</i>			****	Belbis , Fakos, Zifta, Qotor	
<i>Analges passerinus</i> (Linnaeus, 1758)		<i>Passer domesticus niloticus</i> <i>Upupa epops major</i>	****	Menia elkamh, Zifta-Tanta, Qotor Zakazik, Belbees, Qotor	
		<i>Analges</i> sp. Gaud and Atyeo (1996)	<i>Columbia livia</i> <i>Passer domesticus niloticus</i> <i>Pycnonotus barbatus</i> <i>Streptopelia senegalensis aegyptiaca</i> <i>Upupa epops major</i>	***	Menia elkamh , Fakos, Tanta, Al-Santa
<i>Analges spiniger</i> Giebel, 1841			<i>Centropus senegalensis aegyptius</i> <i>Passer domesticus niloticus</i> <i>Pycnonotus barbatus</i>	***	Menia elkamh , Fakos Tanta, Al-Santa
		<i>Analges turdinus</i> Mironov, 1985	<i>Turdus merula</i>	***	Qotor- Tanta- Zifta, Al- Santa
<i>Megninia columbae</i> (Boscholz)		<i>Columbia livia</i> <i>Streptopelia senegalensis aegyptiaca</i>	***	Menia elkamh, Alzakazik , Fakos, Tanta	
<i>Temnalges</i> sp.		<i>Centropus senegalensis aegyptius</i> <i>Columbia livia</i>	***	Menia elkamh , Fakos, Belbees, Tanta, Al- Santa	
Family Avenzoariidae		<i>Avenzoaria calidridis</i> (Oudemans, 1904)	<i>Gallinago gallinago</i>	*	Qotor- Tanta- Zifta, Al- Santa
				<i>Avenzoaria totani</i> (Canestrini, 1878)	*
	<i>Avenzoaria</i> sp.	<i>Columbia livia</i> <i>Motacilla alba alba</i> <i>Streptopelia senegalensis aegyptiaca</i>	**	Qotor- Tanta- Zifta, Menia elkamh, Fakos	
		<i>Scutomegninia microfalcifera</i>	*	Menia elkamh , Fakos, Belbees, Tanta, Zifta	
	<i>Zachkvatkinia</i> sp.	<i>Burhinus senegalensis</i>	**	Qotor- Tanta- Zifta, Al- Santa	
<i>Zachkvatkinia turdinus</i>	<i>Hoplopterus spinosus</i>	*	Tanta- Zifta, Menia elkamh, Alzakazik		
	<i>Gallinago gallinago</i>	*	Qotor- Tanta- Zifta, Al- Santa		

\* = 1 ≤ 3 (Low)

\*\* = 4 ≤ 10 (Moderate)

\*\*\* = 11 ≤ 100 (High)

\*\*\*\* = &gt;100 (Very high)

Continue:

Order: Acariformes Suborder: Acaridida	Mite Species	Bird Species	Abundance	Locality
Family Proctophyllodidae	<i>Brephosceles forficiger</i> Magnin and Trouessart, 1884	<i>Upupa epops major</i>	**	Zifta, Menia elkamh
	<i>Brephosceles orientalis</i> (Gaud)	<i>Passer domesticus niloticus</i> <i>Upupa epops major</i>	***	Menia elkamh, Belbees, Qotor
	<i>Brephosceles palagicus</i> Vitzthum 1921	<i>Bubulcus ibis ibis</i> <i>Egretta garzetta garzetta</i> <i>Hirundo rustica savignii</i>	***	Menia elkamh, Belbees, Al- Zakazik, Tanta, , Zifta, Qotor
		<i>Nycticorax nycticorax</i> <i>nycticorax</i>	**	Zifta, Tanta, Qotor
	<i>Brephosceles</i> sp.	<i>Ceryle rudis</i>	***	Menia elkamh, Zifta-Tanta, Al-Zakazik
	<i>Proctophyllodes</i> sp. Gaud and Atyeo ,1996	<i>Ceryle rudis</i> <i>Columbia livia</i> <i>Passer domesticus niloticus</i> <i>Streptopelia senegalensis</i> <i>aegyptiaca</i> <i>Upupa epops</i> <i>major</i>	****	Menia elkamh , Al-Zakazik , Zifta-Tanta
	<i>Proctophyllodes Sylvia</i> Gaud, 1957	<i>Corvus cornix sardonius</i> <i>Upupa epops major</i>	***	Menia elkamh, Belbees , Fakos, Tanta
	<i>Proctophyllodes</i> <i>troncatus</i> Robin, 1877	<i>Passer domesticus niloticus</i> <i>Upupa epops major</i>	***	Belbees , Alzakazik , Fakos, Zifta-Tanta
	<i>Proctophyllodes</i> <i>weigoldi</i> Vitzthum, 1922	<i>Turdus merula</i>	***	Al- Santa, Al- Mahalla- Qotor
	Family Pterolichidae	<i>Montchadskiana</i> <i>securicata</i>	<i>Elanus coeruleus</i> <i>Falco tinnunculus</i> <i>rupicolaeformis</i>	* *
<i>Leptosphyra</i> sp. (Trouessart)		<i>Elanus coeruleus</i> <i>Athene noctua glaux</i>	***	Zifta , Al- Mahalla- Qotor, Tanta
Family Xolalgidae	<i>Xolalgoides palmai</i> Mironov and Perez	<i>Falco tinnunculus</i> <i>rupicolaeformis</i>	*	Menia elkamh, Alzakazik , Fakos, Zifta-Tanta
Family Falcuferidae	<i>Byresalges talpacoti</i>	<i>Columbia livia</i>	**	Menia elkamh, Alzakazik , Fakos, Zifta-Tanta

specially in breeding season, while the lowest infestation with avian mites were Common bulbul, Moorhen and Little owl which infected with two species of mites. In addition to, results indicated to the dominant avian feather mites family was the Proctophyllodidae.

These findings agree with (Lalitha and Alwar, 1961; Alwar, 1970; Rakha, 1980; Abd-Allah, 1993 and Pavlovic, 2003).

The obtained data agree with (Gaud and Atyeo, 1996; Proctor, 2003) found the families Proctophyllodidae and Trouessartiidae are predominately associated with passerines, while members of the families Analgidae and Psoroptoididae are known from various orders of birds. Rodrigues *et al.*, (2015) recorded 19 feather mite species belonging to four families of the superfamily Analgoidea (Analgidae,

Proctophyllodidae, Psoroptoididae and Trouessartiidae). Fifteen feather mite taxa distributed into the families Analgidae, Proctophyllodidae, Psoroptoididae, Pteronyssidae, Xolalgidae, Trouessartiidae, Falcuferidae and Gabuciniidae. Silva *et al.* (2015).

Likewise; the obtained data in agreement with Sakr (2017) found that; Feather mites, these include 32 species belonging to 15 families: These species were *Temnalges* sp. follow Analgidae; *Lasioseius lindquisti*, *Lasioseius peritremus* follow Ascidae; *Avenzoaria* sp.1, *Avenzoaria* sp.2 follow Avenzoariidae; *Acaropsellina sollers*, *Cheletomorpha lepidopterom*, *Cheyletus badryi* follow Cheyletidae; *Dermoglyphus columbae*, *Dermoglyphus* sp. follow Dermoglyphidae; *Byresalges talpacoti*, *Pterophagus spilosikyus* follow Falcuferidae; *Androlaelaps casalis*, *Eulaelaps novus*, *Eulaelaps stabularis*, *Hypoaspis orientalis*, *Hypoaspis wahabi* follow Laelapidae;

*Cryptonyssus desultorius* follow Macronyssidae; *Proctophyllodes acanthicaulus* follow Proctophyllodidae; *Dermatophagoides farinae*, *Dermatophagoides pteronyssus*, *Euroglyphus maynei*, *Pyroglyphus africanus*, *Pyroglyphus* sp.1, *Pyroglyphus* sp.2, *Pyroglyphus* sp.3 follow Pyroglyphidae; *Raphignathus* sp. follow Raphignathidae; *Trichouropoda patavina* follow Trematuridae; *Uroobovella krantzi* follow Urodinychidae; *Chiroptuopoda bakeri* follow Uropodidae and *Leptosphyra* sp.1, *Leptosphyra* sp.2 follow Xolagidae.

**Finally**, from the forgoing study it can be concluded that wild birds play an important role as active vectors for dispersion and spreading of parasitic mites. Hence, much more work would be necessary in order to construct an ecological map of mite distribution all over Egypt and to describe a specific way for control such parasitic group of mites that threatens birds' life and productivity.

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