Feather Mite in budgerigars (*Melopsittacus undulatus*)

LJ Filippich[1] and DE Walter[2]

Introduction

Mites (*Acari*) commonly infest cage and aviary birds, including the budgerigar. These arthropods can be divided into three ecological groupings: internal parasites, nest parasites and external parasites and commensals. Internal parasites such as the tracheal mite (*Sternostoma tracheacolum* Lawrence) has been reported in wild budgerigars but it significance appears minimal. Nest parasites such as the red mite (*Dermanyssus gallinae* De Geer) can build up large populations around aviaries, are blood-feeding parasites and can cause disease and death in caged birds. Some of the external parasites, such as *Knemidokoptes pilae* (Lavoipierre & Griffiths) are common around the face and beak of budgerigars (Domrow 1992) and can cause disease; however, the mites commonly found in the feathers of budgerigars appear to be commensals. Feather-inhabiting mites (feather mites) are found on most bird species (except ratites and penguins) and represent several large superfamilies in the mite suborder *Astigmata* (probably over 20,000 species).

Worldwide, two species of feather mites have been reported from budgerigars. *Protolichus lunula* (Robin) (*Pterolichidae*) lives on the exposed surfaces of the wing and tail feathers. *Dubininia melopsittaci* Atyeo and Gaud (*Xolalgidae*) is found on the smaller feathers of the body. These mites are common in budgerigar breeding colonies in South-east Queensland and are usually nonpathogenic and are believed to be mainly scavengers, feeding on fungi, oils and other materials on the surface of feathers. However, heavy infestations of feather mites can cause weight loss, reduced egg production, excessive preening, depluming and self-inflicted injuries (Atyeo and Gaud 1987).

Diagnosis is based on visualising the mite on the feather. Black dots or a line of dots running parallel and close to the rachis of the feather may be seen with the naked eye, or the mites can readily be seen with magnification.

Pyrethrins are natural substances derived from the Chrysanthemum flower and together with piperonyl butoxide which is used as a synergist for pyrethrins, have been widely used as

[1] Department of Companion Animal Medicine and Surgery, The University of Queensland, QLD 4072

[2] Department of Entomology, The University of Queensland, QLD 4072

insecticides in birds. To date, the efficacy of these insecticides in the treatment of feather mites infestation in pet and aviary birds has not been documented.

Drug Trial

A drug trial was carried out on budgerigars with naturally occurring feather mite infestation using a commercially available insecticide spray[1] containing 0.5g/L pyrethrins, 5g/L piperonyl butoxide. The birds originated from a budgerigar breeding colony where, in previous years, ivomectin had been used to control ectoparasites. The birds in this study were randomly divided into 2 groups, a control group of 5 birds and a treatment group of 10 birds. They were housed in standard budgerigar cages in a bird room and the 2 groups were kept 3 metres apart. The control group comprised of 2 female and 3 male birds, aged between 2-5 years. The treatment group comprised of 6 female and 4 male birds, aged between 1-6 years. The mean body weight for the control group and the treatment group before the study was 45.5 ± 5.23 and 48.8 ± 9.44g, respectively, and at the end of the study was 46.4 ± 4.41 and 50.4 ± 7.95g, respectively.

All birds were anaesthetised with isoflurane/oxygen and examined for mites at 0, 1, 3 and 7 days after treatment using 40X magnification (binocular surgical dissecting microscope, J.K. Hoppl corporation) for determining general mite distribution and 100X magnification (Olympus binocular microscope) with full light intensity for mite counts and mite movement. A representative wing and tail feather from each bird was removed, fixed separately in 80% ethyl alcohol and submitted for mite identification. Two hours after the last bird had recovered from anaesthesia, the birds were sprayed. The control group was sprayed with tap water while the treatment group was taken into another room and sprayed with the insecticide spray. The spray container was held approximately 40 cm from the bird and the body feathers and both the dorsal and ventral surfaces of the wing and tail feathers were sprayed. Their cage and perches were also sprayed after the feed and water containers were removed.

Results

The mites were identified as *Protolichus lunula* (Robin) (*Pterolichidae*) on the wing feathers and *Dubininia melopsittaci* Atyeo and Gaud (*Xolalgidae*) on the tail feathers. The mean mite counts ((SE) on the feathers submitted for mite identification were 170 (36 active stages of *P. lunula* (N=15) and 218 (52 active stages of *D. melopsittaci* per feather (N=12). On most birds the mites were numerous with at least one mite wedged neatly and firmly in each angle formed by the feather barb and rachis. In some areas they were 3-4 mites thick. In most cases, both sides of the rachis were involved except for the anterior edge of the outer most primary feather. Greatest concentrations of mites were found on the inner primaries, outer secondaries

[1] Aristopet bird mite and lice spray, Aristopet Pty Ltd, Eagle Farm, QLD 4009

and tail feathers. Arthropod eggs were found on the ventral wing coverts but largely disappeared in the treatment group by day 7.

The control group had greater than 100 mites/feather, except for one bird which had 30-40 mites/feather (Table). The mite population on the wing and tail feathers did not change during the study in this group and the mites generally moved in response to bright light being shone through the feather.

The treatment group had greater than 100 mites/feather, except for one bird which had 20-50 mites/feather. Day 1 after treatment, the mites appeared structurally normal in body shape but were not wedged firmly between the feather barb and rachis and were not lying parallel to the rachis. With the aid of a bright light through the feathers, the number of mites that moved while counting a minimum of 400 mites was noted and averaged per 100 mites. By day 3 after treatment, a large amount of debris (mite parts) was found on the feathers and the number of intact, normal-shaped mites had decreased. Many mites appeared swollen, flattened or mis-shaped. Up to 3-5 feathers were required to be examined in order to count a minimum of 100 whole mites. By day 7 after treatment, most of the mite debris seen on day 3 had gone and the number of mites per feather had greatly decreased. The worst infected feather from each bird was removed, the mites counted and each mite was individually probed with a 25G needle to elicit movement. The live/dead mite count decreased from more than 100 live mites/feather prior to treatment to less than 5 live mites/feather (Table). No toxicity was observed in the birds during the study.

In conclusion pyrethrins with piperonyl butoxide are safe and effective in treating feather mites in budgerigars. It is recommended to repeat the treatment after 7-10 days.

Acknowledgment

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References

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Table: The effect of a commercial insecticide spray* on feather mites in budgerigars over 7 days.

Bird number	Number of mites/feather	Post-treatment period (days)		
		1	3	7
		Movement/no movement mite count #	Movement/no movement mite count #	Live/dead mite count $
1	> 100	0/100	0/100	0/23
2	> 100	5/100	1/80	0/27
3	> 100	4/100	3/100	0/8
4	> 100	2/100	2/100	1/18
5	> 100	1/100	0/100	4/32
6	> 100	7/100	1/100	0/8
7	> 100	3/100	0/100	0/11
8	> 100	4/100	3/100	0/5
9	> 100	10/100	0/100	0/8
10	20 - 50	0/100	0/100	0/7

* 0.5g/L pyrethrins, 5g/L piperonyl butoxide (Aristopet bird mite and lice spray, Aristopet Pty Ltd)

\# Mite movement induced by bright light

$ Based on the worst infested feather