

Blood-sucking mite Dermanyssus hirundinis (Herm.) (Acari, Gamasida, Dermanyssidae) found in a nest of Swallow (Hirundo rustica) from the Faroes

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Úrtak

Mottur, ið súgva blóð, *Dermanyssus hirundinis*, vóru funnar í túsundatali í einum svalareiðri (*Hirundo rustica*) í Tórshavn. Mottuslagið verður lýst og borið saman við *Dermanyssus gallinae*, sum er kent um allan heim sum eitt skaðadýraslag, ið heldur til, har ið flogfenaður verður aldur. *D. hirundinis* er fyrst og fremst funnin í útnyrðingspartinum av Evropa.

Abstract

Thousands of bloodsucking mites, *Dermanyssus hirundinis* were found in a nest of swallow (*Hirundo rustica*) from Tórshavn, the Faroe Islands. The mite species is described and compared to *Dermanyssus gallinae*, which is known world-wide as a pest species in poultry farms. *D. hirundinis* is primarily found in north-western Europe.

Introduction

Few swallows (*Hirundo rustica*) nest each year in the Faroe Islands but their breeding success as well as the amount of parasites and other invertebrates in the nest material has untill now not been investigated.

In august 1996 a nest of swallow was collected from a garage close to The Museum of Natural History in Tórshavn. The nest had been occupied with four nestlings

this summer and had been abandoned two weeks previous the sampling time. The nest was cut down and put into a plastic zip-lock bag. When handling the mites immediately left the nest material and crawled inside the plastic bag five to ten minutes. They hereby returned to the nest material, apparently because there was no bird to suck blod from.

A week later, back in Denmark, the mites were still extremely active when handling the nest and therefore the nest was directly placed in 70% alcohol. Traditional extraction was impossible because of the extreme activity of the mites.

The simple construction of the nest with few straws and feathers and only covered with clay soil on the outer edges made it possible to separate the mites from the nest material.

The number of mites was estimated by counting the number of mites in five incidental subsets of the material. The mites were determined to species level and other invertebrates to taxa as shown.

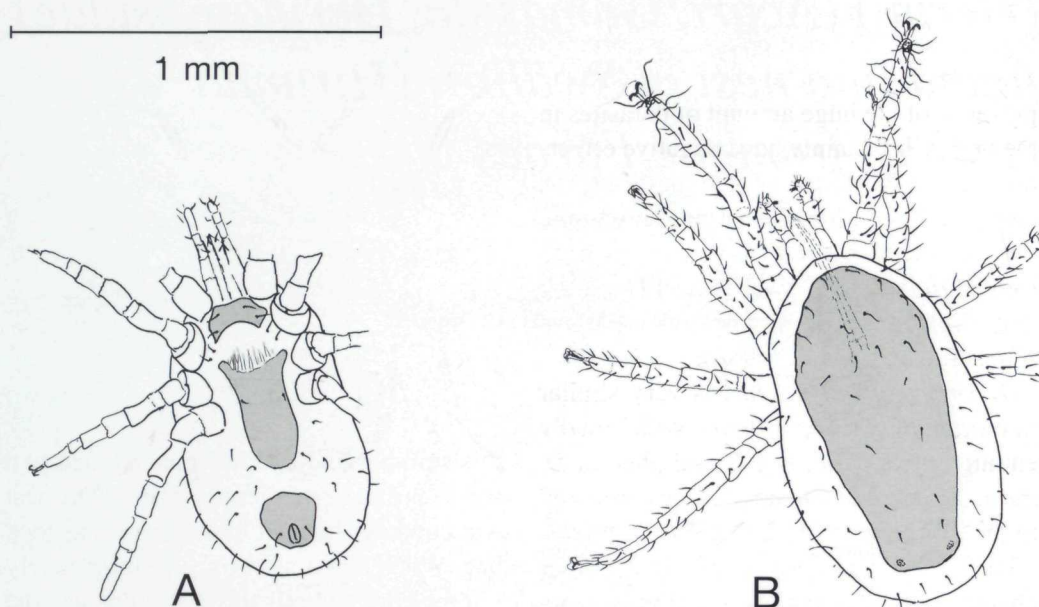


Fig. 1. *Dermanyssus hirundinis*, female, ventral (A) and dorsal side (B).

Results

The nest was built in the beginning of June and left late in July, meaning that it had been occupied by swallows for almost 7 weeks.

The following invertebrates were found in the nest material:

Coleoptera:	<i>Ptinus tectus</i> Boield. (synatropical species originally from Australia)	6
Mites:	Gamasida: <i>Dermanyssus hirundines</i> (Hermann 1804)	7.500*
	Acaridida: <i>Glycyphagus domesticus</i> (De Geer)	50
	Psocoptera: sp	1

Species with an asterisk * are new to the Faroe Islands.

Dermanyssus hirundinis makes out more than 99% of the number of invertebrates in the nest material. This haematophagous mite belongs to the family *Dermanyssidae*, which is known world-wide because of the species *D. gallinae*, the common chicken mite – an economic pest species in poultry farms. Species in this family all suck blood from different birds and mammals and some of them may be rather host specific as *D. hirundinis*.

The females of the *Dermanyssidae* pro-

duce many eggs – hundreds up to thousands of eggs depending on the different species. The very short life cycle of the mites, less than 10 days, makes it possible to establish a huge population within a few weeks. The presence of the huge amount of parasites in the nest will certainly have negative effects on the development of the nestlings. A closely related mite, the tropical fowl mite *Ornithonyssus bursa*, which also has been found in the nest of swallows in Denmark may even cause the death of the nestlings (Gjelstrup and Møller, 1988).

Dermanyssus hirundinis is very similar in morphology to *D. gallinae*, with broadly ending dorsal plate. The dorsal plate of *D. hirundinis* bears 11 pairs of setae compared to the dorsal plate of *D. gallinae* that bears 15 pairs of setae. In fine details many other characteristics distinguish the species from each other.

The mites of the family Dermanyssidae develop through the following stages: egg, larva, protonymph, deutonymph and the adult stage. Nymphs and adults all seem to be blood-sucking stages. The adult population in the nest from Tórshavn made out half of the mites, and the rest were at the deutonymph stage. The adult mites have at least sucked blood three times (an egg laying female may however suck blood several times), and the deutonymphs two times during their development. This means that there have been sucked blood more than 15.000 times from the swallows that inhabited this nest during the summer. When sucking blood, the mites engorge themselves quickly and the intake of large quantities of blood or lymph during feeding re-

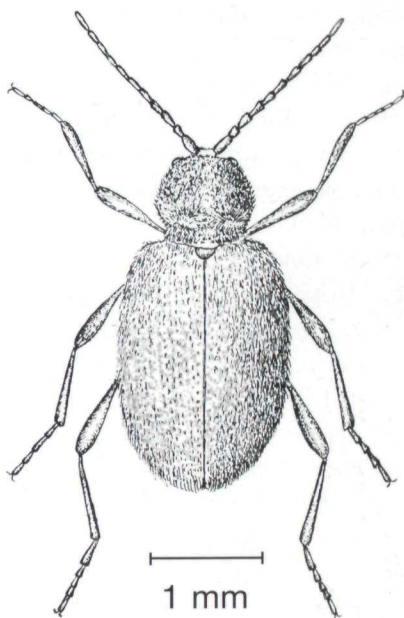


Fig. 2. *Ptinus tectus*. Dorsal side.

sults in considerable enlargement of the body. Then they leave the host to find a suitable place to hide.

The Faroe Islands lies at the extreme border of the distribution of the swallow. Therefore the survival rate for specimens of *D. hirundinis* left in nests in the Faroes may be very questionable.

Few of the nests in the Faroes do get occupied the following year. The reason may be that the swallows do not return to the Faroes, or that the nest is too fragile for re-occupation. Another possibility is, that the swallows are aware of the infection rate of the nests.

In 1992 another nest of swallow from

Fuglafjørður was investigated, but no *D. hirundinis* was found in this nest. This may possibly indicate that the swallows in the Faroes may not be out of the same population but may be individuals coming from different areas in England, Scotland, Ireland or Scandinavia. If they were out of the same population, the chance of being infected with mites would be very high.

In northern Europe *D. hirundinis* is known from Britain (Evans, 1966; Thomsen, 1961 (as *D. gallinae* ?)), Denmark (Gjelstrup, 1988, unpublished), Schweiz (Büttiger, 1944), Norway (Mehl, 1978). It is primarily known from Swallow, House Martin (*Delichon urbica*) and swift (*Apus apus*).

It has been reported from Europe and U.S.A. that species of the family *Dermanyssidae* is able to transport different virus and bacteria to their hosts. Since the mites in different ways may reduce the reproductive success of their hosts, it might be useful to further investigate the occurrence of the mite species *D. hirundinis* in the Faroes.

Acknowledgement

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Literature

- Büttiger, W. 1944. Die Parasiten und Nestgäste des Mauerseglers (*Micropus apus* L.). – *Der Ornithologische Beobachter* 41(3/4): 25-35.
- Evans, G.O. and W.M. Till 1962. The Genus *Dermanyssus* De Geer (Acari: Mesostigmata). – *Annals nat. Hist.* 13: 273-293.
- Evans, G.O. and W.M. Till 1966. Studies on the British *Dermanyssidae* (Acari: Mesostigmata). Part II Classification. – *Bull. Br. Mus. nat. Hist. (Zool)* 14: 107-370.
- Furman, D.P. 1963. Problems in the control of poultry mites. – *Advances in Acarology I.* – Cumstock Publ. Assoc. 38 pp.
- Gjelstrup P. and A. Pape Møller 1986. A tropical mite, *Ornithonyssus bursa* (Berlese, 1988) (Macronyssidae, Gamasida) in Danish swallow (*Hirundo rustica*) nests; with a review of mites and ticks from Danish birds. – *Ent. Meddr.* 53: 119-125.
- Mehl, R. 1978. Henvendelser angående skadedyr, ekto-parasitter og andre plagsomme dyr i 1972-1976. – *Fauna* 31: 250-267.
- Moss, W.W. 1978. The mite genus *Dermanyssus*: a review, with description of *Dermanyssus trochilinis* n.sp. and a revised key to the species (Acari: Mesostigmata: Dermanyssidae). – *J. Med. Ent. Honolulu* 14(6): 627-640.
- Strandtmann, R.W. and G.W. Wharton 1958. A manual of the mesostigmatid mites parasitic on vertebrates. Inst. Acarology, Maryland, U.S.A. Contr. No. 4.
- Thomsen, G. B. 1961. The Parasites of British birds and Mammals. XXXV. The ectoparasites of the swallow (*Hirundo rustica rustica* L.). – *The Entomologist's Monthly Magazine* XCVII: 79-83.
- Zemskaya, A.A. 1968. Sparrow mite *Dermanyssus passerinus* Berlese and Trouessart. – *Med. Parazitol. i. Parazitar. Bolzeni* 37 (3): 313-319.
- Zemskaya, A.A. 1971. Mites of the family *Dermanyssidae* Kolenati, 1859, of the U.S.S.R. fauna. – *Med. Parazitol. i. Parazitar. Bolzeni* 40 (6): 709-717.
- Younker, C. E. and F.J. Radowsky 1966. The dermanysid mite in the Panama (Acarina: Dermanyssidae). – *Ectoparasites of Panama*: 83-103.