

Mites of stored hay on the Faroe Islands (Acari)

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The following species were identified from 62 samples of hay: *Acarus farris*, *Tyrophagus longior*, *T. similis*, *Glycyphagus domesticus*, *Lepidoglyphus destructor*, *Coccotydeus* sp., *Tydeus* sp., *Cheyletus eruditus*, *Tarsonemus* sp. (undescribed), *Androlaelaps casalis casalis*, *Proctolaelaps pygmaeus*, *Kleemannia plumigera* and Cryptostigmata spp.

The Faroese mite fauna of stored hay is very similar to that known from stored hay in other northern European countries but differs from that of Iceland by having a niche for *Tyrophagus longior*. Apart from this it is concluded that northern European stored hay is apparently dominated by the species of *Acarus*, *Tyrophagus*, *Glycyphagus* or *Lepidoglyphus*, *Tydeus*, *Tarsonemus* and *Cheyletus*. These genera are most frequent and therefore the most relevant to test for when considering occupational asthma due to dust from stored hay.

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Introduction

Stored hay in cold-temperate climates is attacked by microfungi. Later on a fauna of fungivorous mites and their predators appears (Hallas & Gravesen 1987). The mite faunas of stored hay are known from Iceland (Hallas 1981), Orkney Islands (Cuthbert et al. 1980), Finland (Terho et al. 1982), Denmark (Iversen et al. in press) and Switzerland (Hockenjos et al. 1981). Biologically the mite populations are harmless and may even prevent the hay from becoming mouldy. From a medical point of view, however, these mites are unwanted because they produce allergenic dust causing occupational asthma among farmers handling the mite-infested hay. The phenomenon is well known and a large amount of literature exists about allergy towards mites of stored products, e.g., van Hage-Hamsten (1988). House dust mites, causing similar allergy, occur in some few homes. Hay mites are generally present in all lots of stored hay.

Preliminary investigations in 1981 of hay from the Faroe Islands gave us the impression that there might be some differences between the Icelandic and Faroese faunas. Such differences are important, as doctors have to test patients with extracts of the relevant mite species in order to diagnose allergy to hay mites properly and to prescribe a proper treatment. Therefore the Administration of Occupational Safety and Health of the Faroe Islands and the Danish Pest Infestation Laboratory conducted the present survey of the mite fauna of stored hay in the Faroe Islands.

Materials and methods

Mainly during the last week of October, 1988, 62 samples were collected in small polyethylene bags by the staff of the Faroese Laboratory of Occupational Safety and Health in Saltangara. Sampling sites (Fig. 1) were evenly distributed on the islands. The

samples were sent to the Danish Pest Infestation Laboratory in Lyngby and extracted for 24 hours in batteries of Berlese funnels. Lactic acid coloured with Lignin Pink was used as collection fluid. The mites were allowed to clear some weeks in the collecting fluid, after which they were washed on filter paper with a mixture of glycerol and ethanol followed by tap water and transferred to slides with a drop of Hoyers medium. The mounted mites were identified under a compound microscope at 100-400 X magnification with phase contrast. The main taxonomic reference was the monograph by Hughes (1976).

Results

We found 13 taxa: *Acarus farris* Oudemans, 1905 (in 34 samples), *Tyrophagus longior* (Gervais, 1844) (25), *T. similis* Volgin, 1949 (3), *Glycyphagus domesticus* (De Geer, 1778) (14), *Lepidoglyphus destructor* (Schränk, 1781) (26), *Coccotydeus* sp (3), *Tydeus* sp. (31), *Cheyletus eruditus* (Schränk, 1781), (4), *Tarsonemus* sp. (undescribed) (28), *Androlaelaps casalis casalis* (Berlese, 1887) (3), *Proctolaelaps pygmaeus* (Muller, 1859) (1), *Kleemannia plumigera* Oudemans, 1930 (9) and *Cryptostigmata* spp. (7).

The number of taxa found in the samples ranged from 0 to 6: 0 taxa (in 7 samples), 1 (8), 2 (8), 3 (11), 4 (12), 5 (13) and 6 (in 3 samples). No sample showed more than six taxa. Co-occurrence of species was not significantly different from chance expectations. No significant geographical clustering of taxa was recognized. Thus, the mite fauna of stored hay on the Faroe Islands appears rather homogeneous and may be reasonably well expressed by the frequencies of the single taxa.

Discussion

Although the northern European mite fauna is poorly known, a pattern begins to appear



Fig. 1. Sampling sites on the Faroe Islands.

Fig. 1. Prøvetagningsområder på Færoerne.

from Table 1. The fauna seems to be dominated by members of the genera *Acarus*, *Tyrophagus*, *Lepidoglyphus* or *Glycyphagus*, *Tarsonemus*, *Tydeus* and *Cheyletus* (Fig. 2) *A. farris* is found in most hay types, also on the Orkney Islands (78.7% occurrence, Ingram et al. 1979). As *Tyrophagus longior* is rare in Iceland but common in hay samples from the Faroe Islands, Finland, Denmark and the Orkney Islands (94.3% occurrence according to Ingram et al. 1979), we may conclude that the Icelandic fauna is different from the others as regards *Tyrophagus*. A closely related species, *T. similis*, is seen in low frequencies in both Icelandic and Faroe samples. It is, however, a free-living species (Hughes 1961) which does not multiply in stored hay. In Switzerland

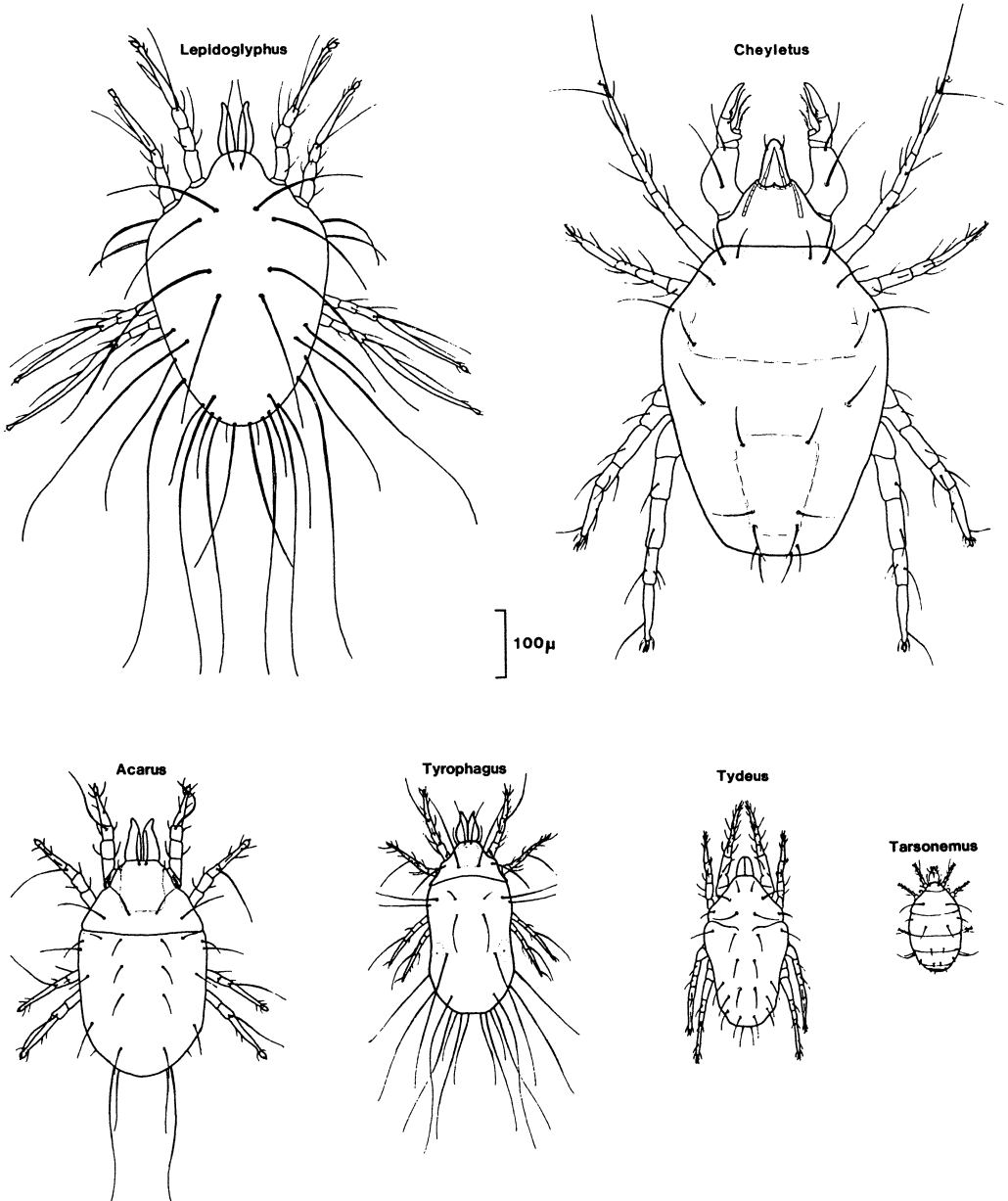


Fig. 2. The six most frequent genera of mites in stored hay on the Faroe Islands. The figures show adult females. Compiled and redrawn from Hughes (1976).

Fig 2. De seks mest almindelige mideslægter i oplagret hø på Færøerne. Der er vist adulte hunner. Samlet og gentegnet fra Hughes (1976).

(Hockenjos et al. 1981) the *Tyrophagus* niche in hay is occupied by *T. putrescentiae*. This was not unexpected, as Robertson

(1961) demonstrated that *T. putrescentiae* becomes more frequent than *T. longior* in warmer climates. Such temperature-depen-

dent distribution may also partly explain why *G. domesticus* is not found in Icelandic hay but appears on the Faroe Islands. For the other species in Table 1 the differences between countries are less pronounced and might be ascribed to the age of the samples.

Acarus, *Tyrophagus*, *Lepidoglyphus* and *Glycyphagus* are fungivorous and ingest pieces of food with their chelicerae. Therefore they produce a lot of dust (as fecal pellets) and are known to be potent allergens. Faroese farmers suspected of occupational asthma due to dust from stored hay should be tested for reactions against allergens from these four mite genera. Extracts of the mites are commercially available. *Tarsonemus*, *Tydeus* and *Cheyletus* are frequent, too. They are stylet feeders and ingest liquid food; they might thus produce fewer fecal pellets, but their allergenic status remains unknown. *Tarsonemus* and *Tydeus* could be predators or omnivorous. *Cheyletus* preys upon other mites.

Sammendrag

Mider i oplagret hø kan være årsag til luftvejsallergier hos de mennesker, der håndte-

rer høet. Det er især et problem i lande med et koldt, tempereret klima, hvor høet oplagres så fugtigt, at der kan leve mider i det.

Hvis man skal stille diagnosen for hømide-allergi, er man nødt til at vide, hvilke hømide-arter, der lever i høet det pågældende sted. Derfor indgik Statens Skadedyrlaboratorium og Arbejdstilsynet på Færøerne et samarbejde om at kortlægge den færøske hømide-fauna. Vi fandt 13 taxa i 62 prøver. Der er ingen regional fordeling af faunaen mellem øerne, og den ligner den fauna, vi kender fra andre nordeuropæiske lande. Den islandske hømide-fauna er dog lidt forskellig fra den færøske, idet miden *Tyrophagus longior* tilsyneladende har sin nordgrænse et sted mellem disse to lande.

På baggrund af undersøgelsens resultater konkluderes det, at det vil være mest relevant at teste færøske borgere, der bliver syge af høstøv, med ekstrakter af mider fra slægterne *Acarus*, *Tyrophagus*, *Lepidoglyphus* og *Glycyphagus*.

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Table 1. Occurrence of the most frequent mite taxa of stored hay in four northern European countries. *Tabel 1. De hyppigst forekommende midetaxa i oplagret hø i fire nordeuropæiske lande.*

Country	Faroe Islands	Denmark	Iceland	Finland
Reference	This work	Iversen et al. in press	Hallas 1981	Terho et al. 1982
Number of samples/farms	62	48	36	11
Age of hay (c. months)	4	6	9	–
% occurrence in samples				
<i>Acarus farris</i> (or <i>A. siro</i> s.l.)	55	69	81	64
<i>Tydeus</i> sp.	50	42	78	82
<i>Tarsonemus</i> sp.	45	60	97	55
<i>Lepidoglyphus destructor</i>	42	67	83	64
<i>Tyrophagus longior</i>	40	54	0	36
<i>Glycyphagus domesticus</i>	23	2	0	64
<i>Cheyletus eruditus</i>	7	31	50	45
Other mites	32	13	60	–
All mites	89	98	100	100

Public Health Director of Iceland. Karl-Martin Vagn-Jensen of the Danish Pest Infestation Laboratory drew Fig. 2.

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Mindre meddelelse

Hydrochus megaphallus Berge Henegouwen, 1988 (Coleoptera, Hydrochidae) fundet i Danmark

For en halv snes år siden reviderede Angus (1977) typematerialet af nogle af de europæiske arter af vandkær-slægten *Hydrochus* og konstaterede i den forbindelse, at den art, der gik under navnet *H. elongatus* (Schaller, 1783), omfatter to i Europa vidt udbredte arter. Begge disse, dvs. den »rigtige« *elongatus* og *ignicolis* Motschulsky, 1860, viste sig at findes i Danmark, og deres udbredelse her blev kortlagt af Hansen (1978).

Nu har den art, vi kender som *H. brevis* (Herbst), måttet dele samme skæbne, idet Berge Henegouwen (1988) fra denne har udskilt en ny art, som han beskriver under navnet *H. megaphallus*.

Da *megaphallus* i lighed med *brevis* har vist sig at være vidt udbredt i Europa, var der grund til at formode, at begge arter også forekommer her i landet. En undersøgelse af samlingerne på Zoologisk Museum (Køben-

havn), Naturhistorisk Museum (Århus) samt materiale stammende fra mine egne indsamlinger viste da også, at vi har begge arter.

H. megaphallus er i Danmark udbredt, men sjældent, og tilsyneladende tiltaget i sjældenhed. Efter 1950 er den kun fundet fåtalligt følgende steder. SZ: Holmegårds Mose; NEZ: Malmmosen; B: Iglemose i Almindingen. – Fra ældre tid foreligger endvidere eksemplarer fra SJ: Lundtoft (1936); WJ: Esbjerg (1918); EJ: Nim (1948); NEJ: Aså (1936); F: Sanderum (1903), Tranekær (1937); NEZ: Furesøparken og Ågesholm (1924-47), Utterslev Mose (1909).

Arten er også kendt fra Norge (uden nærmere lokalitetsangivelse) og Finland (*Karelia borealis*) (Berge Henegouwen 1988) og fra Sverige (Nilsson 1988). I Sverige er den, som i Danmark, betydeligt sjældnere end *brevis* og kun fundet sporadisk i distrikterne Sk, Öl., Gtl., Ög., Sdm., Upl. og Vstm. Den synes også der at være blevet sjældnere i nyere tid. Arten er i øvrigt vidt udbredt i Mellem- og Østeuropa; den er kendt fra England, Holland, Tyskland, Østrig, Polen, Tjekkoslovakiet, Ungarn, Rumænien og Tyrkiet (Berge Henegouwen l. c.).