

THE NASAL MITES OF THE DOMESTIC GOOSE AND THE EIDER (ACARINA, RHINONYSSIDAE)

by

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In the year 1895 Trouessart described a new species: *Sternostomum rhinolethrum*¹⁾ (at present known as *Rhinonyssus rhinolethrum* (Trouessart, 1895)) from the nasal cavities of the Domestic Goose, *Anser anser* (L.).

Trouessart's description was preliminary, but the promised complete description with figures in the Bulletin de la Société Zoologique de France was never published.

Strandtmann (1956, pp. 137-140) and Fain (1957, pp. 42-44) have sufficiently explained that the species *R. rhinolethrum* is not the type species of *Sternostomum* Trouessart, 1895, an invalid emendation of the generic name *Sternostoma* Berlese & Trouessart, 1889, and that it does not even belong to the genus *Sternostoma*. It should be placed in the genus *Rhinonyssus*.

In 1904 (pp. 28-30, figs. 42-47, Pl. 1 figs. 1, 3, 8) Trägårdh described under the name *Sommatericola levinseni* nov. gen. nov. spec.²⁾ a similar species, found by Prof. Levinsen in the nose of the Eider, *Somateria mollissima* (L.), on Greenland. It seems that Trägårdh was not aware of Trouessart's paper, as he does not refer to it at all.

Yet Trägårdh must have seen some of Trouessart's papers, as on p. 29 he makes a comparison with the genus *Ptilonyssus*.

In his description of *Sommatericola levinseni* Trägårdh made various mistakes, the most confusing being that his "male" was in reality a deutonymph (no dorsal shield), so that he did not observe a real male at all. His fig. 44 shows typically the claws of a nymph. The tarsal setae are incorrectly represented, as in reality the sensorial area of tarsus I shows hairs of a different shape and arrangement. Therefore all Trägårdh's conclusions and comparisons in this respect are incorrect. The real male of

1) Trouessart used in his 1895 paper also the spelling *rinolethrum*. The spelling *rhinolethrum* is combined with the indication "n. sp." and has been chosen by the first revisor, Vitzthum 1935.

2) Trägårdh indicated the eider erroneously as *Sommateria*, with double "m". Hence the wrong spelling of his generic name.

the species is indeed somewhat smaller than the female, but it has the same type of dorsal shield and its genital opening, in laying between coxae II, is of the same type as in other Rhinonyssidae and in Gamasides in general. Vitzthum (1935, p. 569) expressed already his doubt about the correctness of the description of the male by Trägårdh.

Trägårdh's indication "feine Ritze" was only the result of his efforts to find a genital aperture in his supposed male.

Hirst (1921, p. 357) considered the genera *Rhinonyssus* and *Somma-tericola* synonymous, but he still maintained the species *R. levinseni*. Vitzthum (1935, p. 569) indicated the possibility of synonymy of the two species. Later authors have definitely arrived at the conclusion that *R. rhinolethrum* and *R. levinseni* have to be considered synonymous and that mites of other Anatidae belong to the same species. This idea has become a tradition. This tradition, however, proves to be erroneous. The morphological differences between the two parasites are so great, that it can be said that the domestic goose carries an entirely different species of mite than the eider. Consequently the mites from other anamid hosts, mentioned in recent papers, need a new study.

The most striking differences between Trouessart's and Trägårdh's species are the following:

R. rhinolethrum

Palp with one rather thick ventral spine (fig. 26).

No big spines ventrally on leg I (fig. 19).

Sensorial area of leg I as fig. 25.

Ventral hairs inflated, tapering evenly into the terminal flexible tip (fig. 23).

Anal shield \pm cup-shaped with broad lines (fig. 24).

No postanal hair.

R. levinseni

Palp with various big lateral spines (fig. 12).

One rather big spine ventrally on the femur and genu I (fig. 5).

Sensorial area of leg I as fig. 11.

Ventral hairs inflated, tapering suddenly into the terminal flexible tip (fig. 9).

Anal shield long and plain with marginal frame (fig. 10).

Postanal hair present (fig. 10).

Trouessart has never published a figure of his species. The only drawing known to me, really representing the mite of the domestic goose, can be found in Berlese (1912, p. 71), a figure copied by Hirst (1922, figs. 75, 76) and Bregetova (1956, fig. 486).

All other drawings of *R. rhinolethrum* refer to mites from other hosts and are therefore not or probably not representing the correct species.

Berlese's figure certainly represents the same species as my material, as the palps show no spines. Yet Berlese must have been somewhat too liberal with the ventral hairs. He depicted 20 pairs starting at the level of legs IV. In reality there are about 10 pairs, starting behind the genitoventral shield.

MATERIAL EXAMINED

From the Eider Duck, *Somateria mollissima* (L.).

In the year 1956, after a very severe winter, I had the opportunity to collect "*Sommatericola levinseni*" from dead eiders on the coast of Vlieland and Terschelling (two islands off the north coast of The Netherlands), where this duck has become a common breeding bird. Hosts and parasites were as follows: Terschelling, 5 March 1956, 2 male eiders, no parasites. Vlieland, 6 March 1956, 2 male and 8 female eiders, five of which were infected with respectively: 1 female; 1 nymph; 1 protonymph containing a deutonymph; 1 deutonymph containing a male, 2 other nymphs; 3 females.

This material has been supplemented by 2 eiders from Hondsbossche Zeewering near Groet (on the North Sea shore in the province of Noord-Holland), collected by Mr. Chr. van Orden of the Staatsbosbeheer at Haarlem, on 6 January 1963; one of these ducks was infected with 2 females, 3 males, and 1 deutonymph containing a female. Furthermore one duck collected at Den Helder, province of Noord-Holland, by Mr. J. W. Joosten, Nederlands Instituut voor Onderzoek der Zee at Den Helder, 29 January 1963; it was infected with 2 females and 3 nymphs.

From the Domestic Goose.

In the years 1955 and 1956 I obtained from poulterers 12 heads of domestic geese, five of which were infected with respectively: 1 female, 1 male and 3 nymphs; 2 females, 2 males and 2 nymphs (both geese from Amsterdam, 24 December 1955); 1 male, 1 deutonymph containing a male, 2 protonymphs containing a deutonymph, and 7 nymphs (from three geese from Amsterdam, 23 December 1956).

For comparison with these parasites I had at my disposal 86 mites from one wild Gray Lag Goose, *Anser anser* (L.), sent to me by Miss E. van den Broek, Instituut voor Veterinaire Parasitologie, Utrecht. This goose was collected in The Netherlands during the winter of 1963. The mites were found in the following parts of the head of the host: front part of nasal cavity, left side 19, right side 43 mites, of which 5 males, 6 females, 15 nymphs, 3 deutonymphs containing a female, and 2 protonymphs containing a deutonymph; 31 specimens not checked. Central part of the nasal cavity, close together: 10 females. In the fissure of the plate 11 females; in the mouth 3 females.

I had the occasion to compare my recent material with some original specimens of both parasites.

Prof. O. Lundblad of Naturhistoriska Riksmuseet, Stockholm, sent me a slide of Trägårdh, labelled: "*Sommatericola levinseni* n.g.n.sp., Grönland", and containing some fragments of his mite.

Prof. Marc André of the Muséum National d'Histoire Naturelle, Paris, sent me a slide of Trouessart, labelled: "Collection Trouessart, *Sternostomum rhinoletrum* ♀ vivipare (embryons), plaque dorsale, Rollinat, Dans les narines de l'Oie, France", and containing 3 females and 2 loose embryos.

I can say that the morphological details of these old specimens—as far as present or visible—are entirely in accordance with the characters of my recent material from the two respective hosts.

DESCRIPTIONS

The following descriptions are made for the parasites of the eider and the domestic goose only:

Rhinonyssus levinseni (Trägårdh, 1904) (figs. 1-14)

Female, about $1050 \times 650 \mu$ (mounted).

Dorsum. — First half covered by a large propodosomal shield. Shield with rounded front margin (Trägårdh, 1904, pl. 1 fig. 8), hind margin \pm truncated with a distal median projection, the whole shield reticulated, the alveoles irregularly angular and of different size, and forming some groups at certain places. Some 3 pairs of minute hairs near the side margins of the shield and one pair just behind it on the skin. No pores observed.

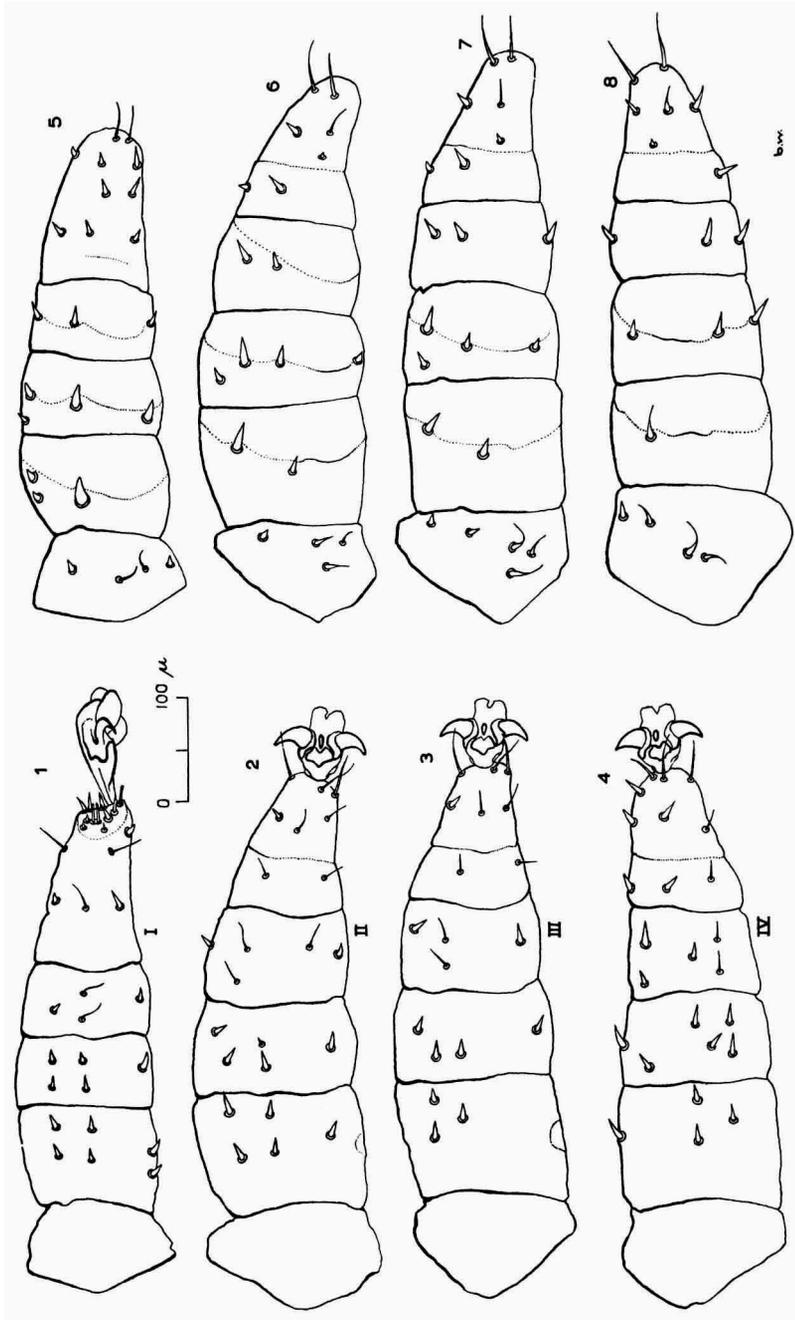
Opisthosoma without any shield and with one pair of minute hairs near the hind margin of the body.

Dorsal striae very fine.

Venter. — Three pairs of sternal hairs, first pair smaller, all swollen basally and ending in a long flexible tip. No sternal shield; at most an indication between the sternal hairs by reduction of the striae.

Genitoventral shield $2\frac{1}{2}$ to 3 times as long as wide with reticulation of broad lines with oblong alveoles. Stigmata without peritrema.

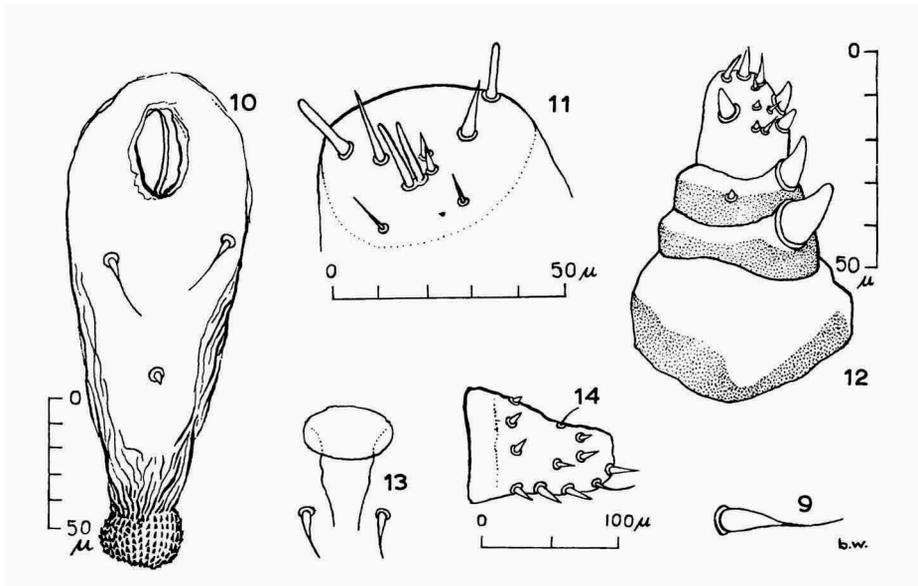
Between genitoventral shield and anal shield about 9 pairs of inflated setae, rather abruptly ending in a long flexible tip (fig. 9). Anal shield (fig. 10) long, plain with a marginal frame of broad lines. Two anal hairs on the shield just behind the anus, smaller and narrower than the ventral setae. One very small postanal hair with a distinct basal ring distally at about $\frac{2}{3}$ of its length. The presence or absence of the postanal hair is an important specific character.



Figs. 1-8. *Rhinonyssus levinsevi* (Trägårdh). 1-4, legs I to IV, ventral view; 5-8, legs I to IV, dorsal view. Bert Weide del.

Palp with various sensorial hairs and 4 big lateral spines (fig. 12). These spines form a good systematic character.

Legs (figs. 1-8) proportionately short and \pm conical. Specially also tarsus I short (figs. 1, 5). Leg I has one conspicuous big spine ventrally on femur and genu. Many other ventral spines rather big. Sensorial area of tarsus I as in fig. 11. Claws I of the usual female type, slender and enveloped in a pearshaped pulvillus (fig. 1). Claws II-IV of the normal type (figs. 2-4).



Figs. 9-14. *Rhinonyssus levinseni* (Trägårdh). 9, ventral hair; 10, anal area of female; 11, sensorial area of tarsus I of male; 12, palp of female, ventral view; 13, tarsus I of male; 14, genital opening of male. Bert Weide del.

Male, about $825 \times 525\mu$ (mounted).

Dorsum. — Similar to that of the female.

Venter. — Genital opening large and beginning at the level of the first pair of sternal hairs (fig. 13). Sternal hairs similar to those of the female.

Ventral shield, setae and anal area about same as in the female.

Palps about same as in the female.

Legs as in the female, but tarsus I becoming narrower at half distance (fig. 14). Claws I of the male type, namely the same aspect as claws II-IV, but smaller.

Nympha II, about $925 \times 640 \mu$ (feminine), $840 \times 560 \mu$ (masculine), taken from mounted specimens.

Dorsum. — No dorsal shield, but some indications by the striae. Some pairs of minute hairs present.

Venter. — Sternal setae of usual type. No ventral shield, but faintly indicated by the striae.

Ventral hairs about 9 pairs. Anal shield faintly indicated with two anal hairs and one minute postanal seta, but the terminal rough area distinct.

Palps similar to those of adults.

Legs of the usual nymphal type. Tarsus I has the male aspect (distal half narrower) even in feminine nymphs. The big spines of femur and genu I are present. The claws I are small and \pm parallel (Trägårdh, 1904, fig. 44).

Nympha I, about $650 \times 440 \mu$, full grown including Nympha II about $825 \times 500 \mu$ (mounted). Same aspect as Nympha II. The material does not allow a detailed study. The faintly indicated anal shield has two anal hairs, a postanal hair and a distinct terminal rough area.

Larva. No six-legged larva observed. No embryo in the females.

Rhinonyssus rhinolethrum (Trouessart, 1895) (figs. 15-28)

Female, about $1000 \times 640 \mu$ (taken from damaged mounted specimens and from Trouessart's mites).

Dorsum. — Similar to *R. levinseni*, but front margin of the shield making a broad, rounded projection (Berlese, 1925, fig. 62). The few hairs seem to be still smaller than those of *R. levinseni*.

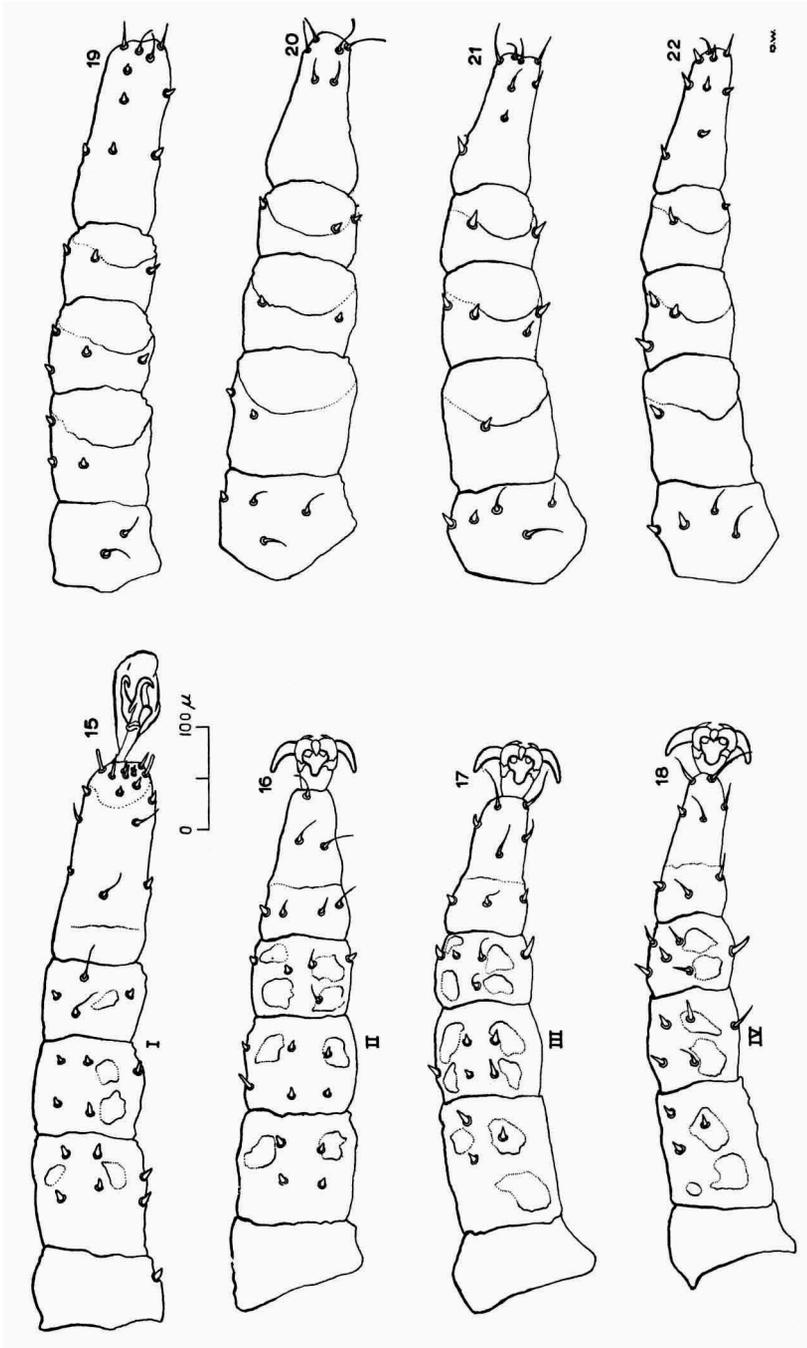
Dorsal striae very fine.

Venter. — Sternal and genitoventral areas similar to those of *R. levinseni*. About 10 pairs of inflated ventral hairs, these tapering more evenly into their flexible tip (fig. 23).

Anal shield (fig. 24) \pm cup shaped (probably variable) with a chitinous construction, the two anal hairs not on the shield, flanking the anus at some distance, the postanal seta fully lacking.

Palps with various sensorial hairs but with only one rather big spine ventrally (fig. 26).

Legs (figs. 15-22) slenderer and more cylindrical than in *R. levinseni*. Tarsus I also longer (figs. 15, 19). No big spine on femur and genu I and nowhere else such spines (fig. 19). Sensorial area of tarsus I as fig. 25.



Figs. 15-22. *Rhinomyssus rhinolethrum* (Trouessart). 15-18, legs I to IV, ventral view; 19-22, legs I to IV, dorsal view. Bert Weide del.

Male, about $850 \times 500 \mu$ (mounted).

Dorsum about same as in the female.

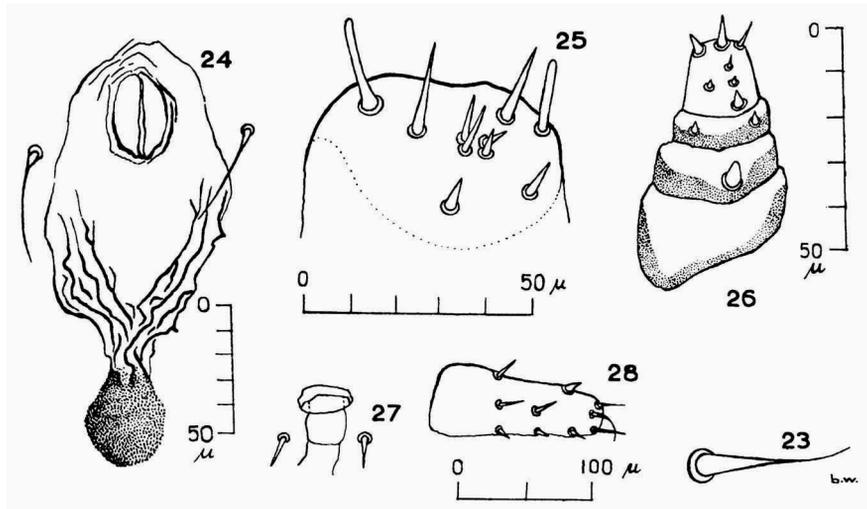
Venter. — Genital opening starting well between the first pair of sternal hairs (fig. 27).

Sternal hairs, ventral shield, ventral hairs and anal area about same as in the female.

Palps about same as in the female.

Legs as in the female, but tarsus I narrower in its distal half (fig. 28).

Claws I of the male type, namely the same aspect as claws II to IV, but smaller.



Figs. 23-28. *Rhinonyssus rhinolethrum* (Trouessart). 23, ventral hair; 24, anal area of female; 25, sensorial area of tarsus I, female; 26, palp of female, ventral view; 27, tarsus I of male; 28, genital opening of male. Bert Weide del.

Nympha II, masculine about $720 \times 440 \mu$ (mounted), feminine presumably slightly smaller than female.

Dorsum. — No dorsal shield. Presumably some minute hairs present.

Venter. — Anal shield faintly indicated with two anal hairs not on the shield, flanking the anal pore, without postanal hair, but the terminal rough area distinct. In some specimens the anal shield seems to be better defined.

Palps similar to those of adult; no conspicuous lateral spines. Legs of the usual nymphal type. No big spines.

Nympha I, about $600 \times 350 \mu$, full grown including Nympha II about $720 \times 440 \mu$ (mounted). Similar to Nympha II. The material does not

allow a detailed study. Anal shield indicated, two anal hairs flanking the anal pore, no postanal hair, distinct terminal rough area.

Larva. — No larva or embryo observed, but Trouessart's slide contains 2 six-legged larvae taken from the body of two females, size $500 \times 280 \mu$ and $560 \times 400 \mu$. The 6 legs with big claws against venter, radiating towards centre. No further details visible.

GENERAL REMARKS

I have compared the mites of the wild Gray Lag Goose, *Anser anser* (L.), with those of its domesticated form. As could be expected, I found no differences of importance. The form of the anal shield seems to be more variable than can be concluded from my limited material of the domestic goose.

Mites from other host species still have to be studied. A provisional impression of my material learns that the mites from the White-fronted Goose, *Anser albifrons* (Scopoli), and the Whooper Swan, *Cygnus cygnus* (L.), resemble *R. rhinolethrum* in having a ventral spine on the palps. Mites with lateral spines on the palps, but different in other characters, have been seen by me from the Mallard (*Anas platyrhynchos* L.), Wigeon (*Anas penelope* L.), Pintail (*Anas acuta* L.), Scaup (*Aythya marila* (L.)), Tufted Duck (*Aythya fuligula* (L.)), Velvet Scoter (*Melanitta fusca* (L.)), Common Scoter (*Melanitta nigra* (L.)), Red-breasted Merganser (*Mergus serrator* L.), Shelduck (*Tadorna tadorna* (L.)), and the Barnacle Goose (*Branta leucopsis* (Bechstein)).

As a result of these and other studies, I cannot be of the same strict opinion as Strandtmann in his 1958 paper, that all the Anatidae have one and the same parasite, namely *Rhinonyssus rhinolethrum*. It is a fact that the mites of these birds are closely related, but their morphological differences cannot be denied and these are too multiple, too constant, and too much tied to a certain host species for the limits of one single species. This does not exclude, of course, that one parasite species may have more than one regular host, and in the case of gregariousness of the hosts an accidental occurrence of a parasite in a host other than the normal one certainly remains possible.

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