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Myobiid Mites of the Genus *Acanthophthirius* (Acarina, Myobiidae) from Japan

(Part 3)

By

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(Communicated by Yoshihiko KUROSAWA)

16. *Acanthophthirius* (*Myotimyobia*) *spiralis* sp. nov.

(Figs. 10, 11 and 19–10)

Male (Fig. 10). Dorsal setae slender. Setae *sc i* ending in blunt tips. Setae d_1 thicker than d_2 on some specimens and *vice versa* on others. Genital shield with spiral tail, bearing 3 pairs of minute setae. Ventral setae ic_2 and ic_4 prominent and other setae minute, but ic_3 considerably long (40 μm) on a paratype. Setae ic_3 situated close to submedian line. Legs and gnathosoma as in Fig. 10. Penis almost straight.

Measurements in microns (holotype and 3 paratypes): Body 420 (420–470) long by 190 (185–190) wide; *ve* 120 (123–140) long; *sc i* 68 (67–70); *sc e* 145 (155–180); d_1 50 (48–60); d_2 60 (55–73); l_1 155 (160–190); caudal 3 pairs of setae subequal in length, 22–23; ic_2 75 (70–95); ic_3–ic_3 43 (45–50); ic_4 33 (35–43); penis about 165.

Female (Fig. 11). Setae *ve* and *sc i* stout, ending abruptly. Setae *ve*, *sc e* and l_1 long, and the same in nature. Four pairs of hysterosomal submedian setae subequal in length. Setae d_4 distinctly barbed; d_5 missing on 2 specimens; l_4 ending in blunt tips. Two pairs of ventral setae, ic_2 and ic_3, long, and ic_4 moderate. An additional seta unilateraly close to g_1 and g_2 on allotype. Opisthogastric sclerites double spherical with inner doublet more strongly sclerotized, situated close to ic_4.

Measurenents in microns (allotype and paratype): Body 550–540 long by 280–280 wide; *vi* 63–65; *ve* 175–?; *sc i* 78–78; *sc e* 200–198; 4 pairs of hysterosomal submedian setae 63–68; l_1 200–195; ic_2–ic_4 on allotype 95, 98 and 33, respectively; ic_4-opisthogastric sclerite 20–20; sclerite-g_1 88–82; sclerite-sclerite 63–57; ic_4–ic_4 62–63.

Material examined. Holotype male ex *Myotis daubentoni*, Memanbetsu, Hokkaido, Japan, 25 June 1971; allotype female from the same host, Sarobetsu, Hokkaido, 31 August 1972; 2 male and a female paratypes from the same host, Nukabira, Hokkaido, 25 July 1966; a male paratype from the same host and locality, 11 August 1966 (coll. Dr. K. MAEDA).

The holotype and allotype are deposited in the collection of the National Science

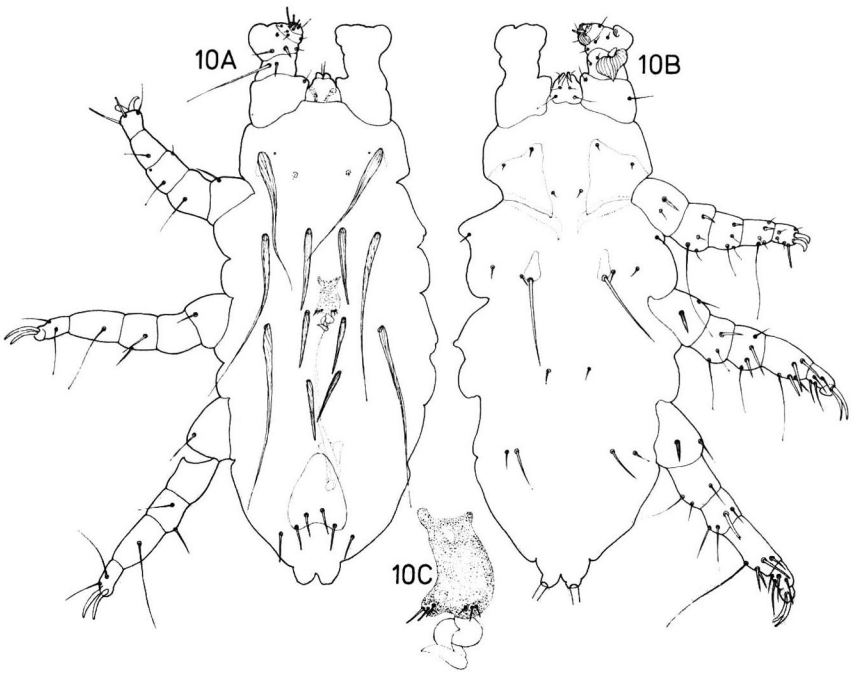

Fig. 10. *Acanthophthirius* (*Myotimyobia*) *spiralis* sp. nov., male. A–dorsum; B–venter; C–genital shield.

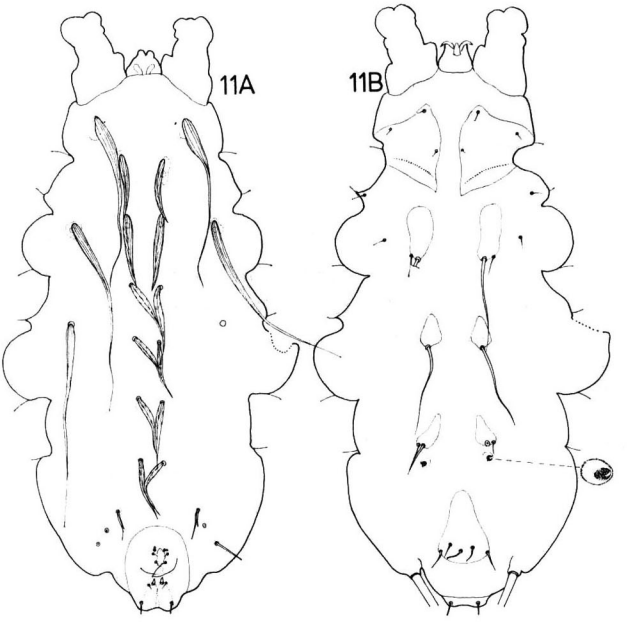

Fig. 11. *Acanthophthirius* (*Myotimyobia*) *spiralis* sp. nov., female. A–dorsum; B–venter.

Museum (Nat. Hist.), Tokyo (NSMT-Ac 9343, 9344) and the other types in the collection of the author.

Notes. The present new species is separable from all the know species of the subgenus *Myotimyobia* FAIN by the particular structure of the male genital shield and female opisthogastric sclerites.

In Europe, *Myotis daubentoni* is know as the host of the specific parasite of the same subgenus, *A.* (*M.*) *dolichophallus* FAIN (FAIN, 1976a). This mite is quite different from *A.* (*M.*) *spiralis* sp. nov., though the host bats of both the mites are named the same. When synhospitalic mites occur on a bat, remarkable differences can be found between such mites as in the case on *Myotis macrodactylus* (UCHIKAWA, 1979). The fact that European and Japanese *M. daubentoni* yielded respective subspecies of *Pteracarus minutus* (UCHIKAWA, unpubl.) suggests, however, that the above difference in *Acanthophthirius* mites is not ascribable to synhospitaly of parasites but to systematic discrepancy of host bats themselves.

17. ***Acanthophthirius* (*Myotimyobia*) *hamatus*** sp. nov.

(Figs. 12, 13 and 19–16)

Male (Fig. 12). Dorsal setae well developed. Setae d_1 originating from different

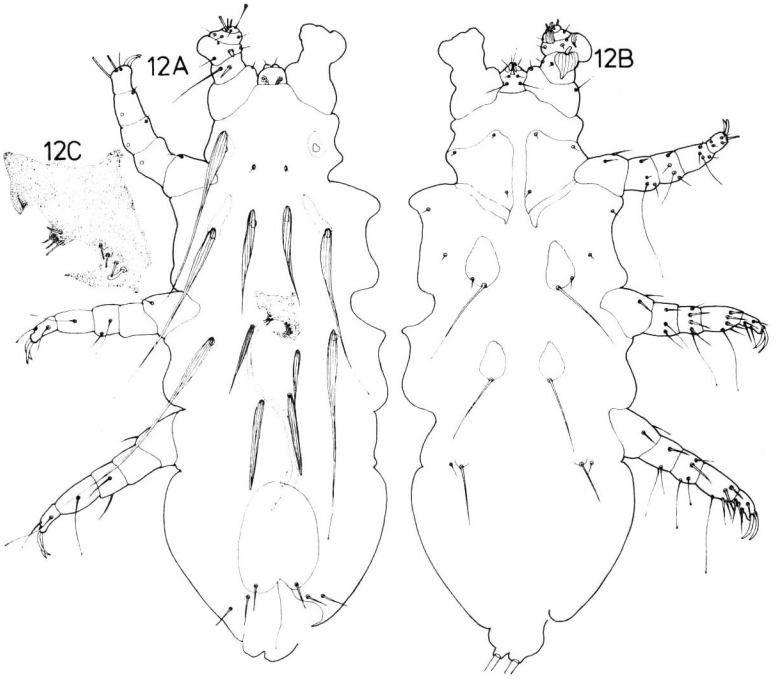

Fig. 12. *Acanthophthirius* (*Myotimyobia*) *hamatus* sp. nov., male. A–dorsum; B–venter; C–genital shield.

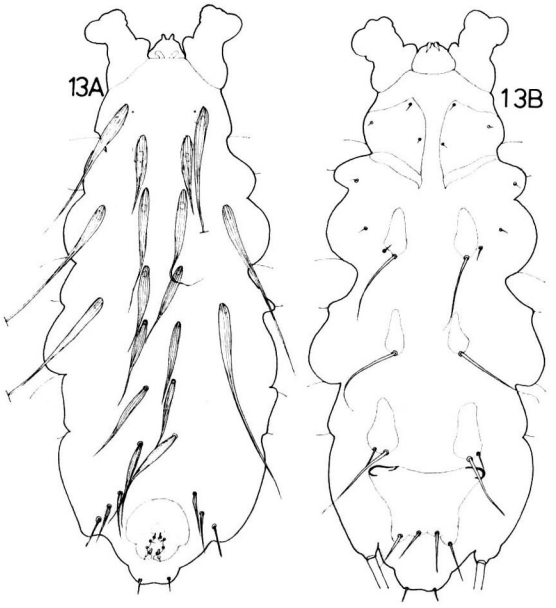

Fig. 13. *Acanthophthirius* (*Myotimyobia*) *hamatus* sp. nov., female. A–dorsum; B–venter.

levels bilaterally. Genital shield hooked posteriorly, bearing 4 pairs of minute setae, one of which is clavated. Penis stout and sinuate. Three pairs of ventral setae, ic_2–ic_4, prominent.

Measurements in microns (holotype and 2 specimens): Body 500 (450–460) long by 190 (190–180) wide; *ve* 135 (125–110) long; *sc i* 83 (75–78); *sc e* 153 (143–153); d_1 60 (48–60); d_2 70 (73–73); l_1 190 (168–175); 3 pairs of caudal setae subequal in length, 23–25; ic_2 80 (78–73); ic_3 65 (75–75); ic_4 56 (53–60); ic_3–ic_4 50 (50–45); ic_4–ic_4 100 (93–85).

Female (Fig. 13). Dorsal setae well developed. Three pairs of intercoxal setae, ic_2–ic_4, long. Genital setae g_1 and g_2 rather long. Opisthogastric sclerites close to ic_4, simple but unique as drawn in Fig. 12B.

Measurements in microns (allotype and 2 paratypes): Body 540 (560–520) long by 230 (240–220) wide; *vi* 75 (73–65) long; *ve* 140 (143–129); *sc i* 103 (105–93); *se c* 180 (185–183): d_1 80 (78–80); d_2 83 (80–78); d_3 90 (95–85); d_4 43 (38–43); d_5 38 (38–41); l_1 213 (200–198); l_2 90 (80–75); l_4 ?(40–41); ic_2 73 (?–75); ic_3 78 (93–93); ic_4 90 (103–95); g_1 43 (43–43); g_2 43 (40–40).

Material examined. Holotype male, allotype female, a pair of male and female paratypes, 6 ♂♂ and 6 ♀♀ ex *Myotis frater*, Sarobetsu, Hokkaido, Japan 14 July 1971; a paratype male from the same host, Hakkoda, Aomori Pref., Japan, 14 August 1970 (coll. Dr. K. MAEDA); a paratype female from the same host, Ina City, Nagano Pref., Japan, 4 September 1973 (coll. Mr. T. AKAHANE).

Notes. The present species is distinctive in having the unique genital shield in the male and the specific opisthogastric sclerites in the female.

The holotype and allotype are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo (NSMT-Ac 9345, 9346), and the other specimens in the collection of the author.

18. ***Acanthophthirius* (*Myotimyobia*) *pruinosi*** sp. nov.

(Figs. 14, 15 and 19–11)

Male (Fig. 14). Dorsal setae rather slender. Setae d_1 situated symmetrically and anteriad from basal level of l_1. Only a single pair of ventral setae, ic_2, long. Setae ic_3 1.5 times as long as *cx*IV. Genital shield elongate, bearing 4 pairs of setae and a prominent, hook-like tail (Fig. 19–11). Penis almost straight and fine apically.

Measurements in microns (holotype): Body 410 long by 180 wide: *ve* 105; *sc i* 68; *sc e* 140; d_1 53–58; d_2 63; penis 150; ic_2 65; ic_4 17.

Female (Fig. 15). Idiosoma slender. Dorsal setae well developed. Two pairs of intercoxal setae, ic_2 and ic_3, long, and ic_4 twice as long as *cx*IV. Opisthogastric sclerites unique as presented in Fig. 15B.

Measurements in microns (allotype and paratype): Body 610–550 long by 280–220 wide; *vi* 78–85 long; *ve* 110–123; *sc i* 100–95; *sc e* 160–165; d_1 73–78; d_2 70–75;

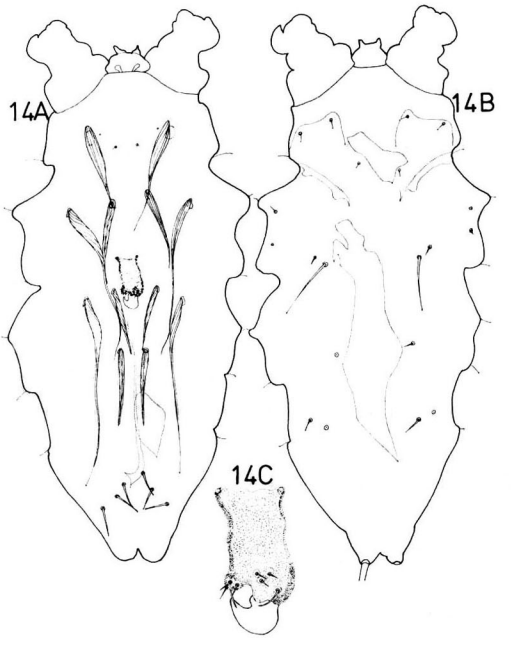

Fig. 14. *Acanthophthirius* (*Myotimyobia*) *pruinosi* sp. nov., male. A–dorsum; B–venter; C–genital shield.

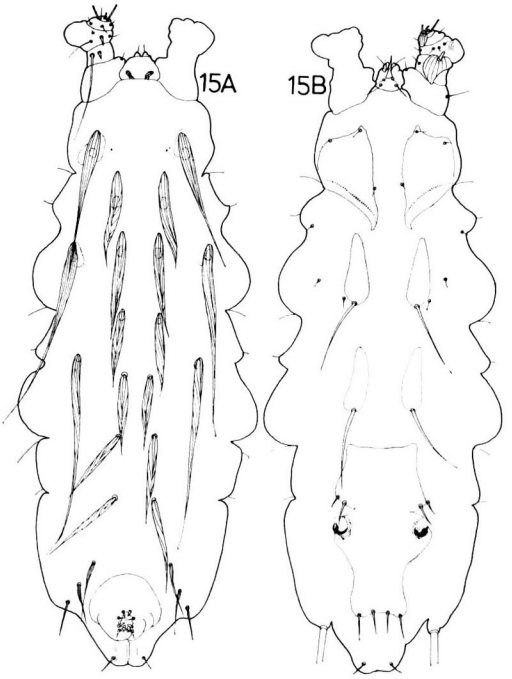

Fig. 15. *Acanthophthirius* (*Myotimyobia*) *pruinosi* sp. nov., female. A–dorsum; B–venter.

d_3 70–85; l_1 182–180; l_2 73–73; ic_2 78–80; ic_3 70–80; ic_4 ?–9; ic_4-opisthogastric sclerite 25–25; opisthogastric sclerite-g_1 80–100; distance between sclerites 80–75.

Material examined. Holotype male ex *Myotis pruinosus*, Omoko-kei, Ehime Pref., 27 May 1970 (coll. Dr. K. MAEDA); allotype female from the same host, Nakatsuhiura-do, Ehime Pref., 22 March 1974 (coll. Miss M. YOSHIYUKI); a female paratype from the same host, near Ishibuchi-dum, Iwate Pref., 13 August 1969 (coll. Mr. K. ENDO); a pair of male and female paratypes from the same host, Yamada Town, Shimohei-gun, Iwate Pref., 13 September 1970 (coll. Mr. K. ENDO).

The holotype and allotype are deposited in the collection of the National Science Museum, Tokyo (Nat. Hist.) (NSMT-Ac 9360, 9361), and the paratypes in the collection of the author.

Notes. Judging from the male genital shield and female opisthogastric sclerites, the present new species is very close to the above *A.* (*M.*) *spiralis* sp. nov. parasitic on Japanese *M. daubentoni*. This suggests that the host of the two mites, *M. pruinosus* and Japanese *M. daubentoni*, are alied to each other.

The author was indebted to Mr. Kimio ENDO, Miyako City, for his help in collecting specimens of the present new species.

19. ***Acanthophthirius* (*Myotimyobia*) *uenoi*** sp. nov.

(Figs. 16, 17 and 19–17)

Male (Fig. 16). Setae d_1 originating from different levels. Setae d_2 stout. Only a single pair of ventral setae, ic_2, long and other setae minute. Setae ic_4 subequal in size to *cx* IV. Genital shield unique, large and one posterior side elongated and recurved, bearing 4 pairs of minute setae, one of which is situated on distal third of recurved arm. Penis long and stout.

Measurements in microns (holotype): Body 520 long by 220 wide; *ve* 150 long; *sc i* 68; *sc e* 175; d_1 58; d_2 78; l_1 200; ic_2 75; ic_3 8; ic_3–ic_3 48; ic_4 10; *cx* IV 10.

Female (Fig. 17). Dorsal setae slender. Two pairs of ventral seta, ic_2 and ic_3, long and other setae minute. Opisthogastric sclerites well developed, combination of flowerbud-like and bell-like formations.

Measurements in microns (allotype): Body 610 long by 260 wide; *vi* about 73 long; *ve* about 150; *sc i* about 80; *sc e* 188 (paratype); d_1 85; d_2 70; d_3 68; d_4 33; d_5 38; l_1 205; l_2 68; l_4 23; ic_2 80; ic_3 75; ic_4-opisthogastric sclerite 25; opisthogastric sclerite-g_1 78; distance between sclerites 53.

Material examined. Holotype male, allotype female and a paratype female ex *Myotis formosus*, Hoge-myeon, Mangyeong-gun, Korea, 26 April 1966 (coll. Dr. S.

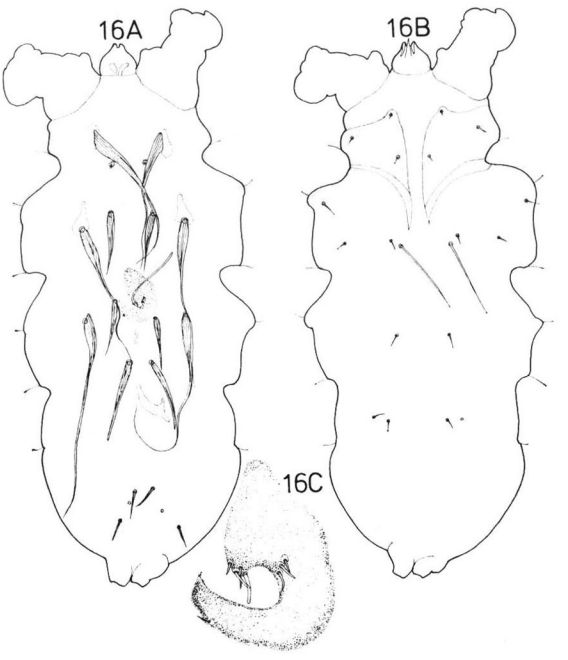

Fig. 16. *Acanthophthirius* (*Myotimyobia*) *uenoi* sp. nov., male. A–dorsum, B–venter; C–genital shield.

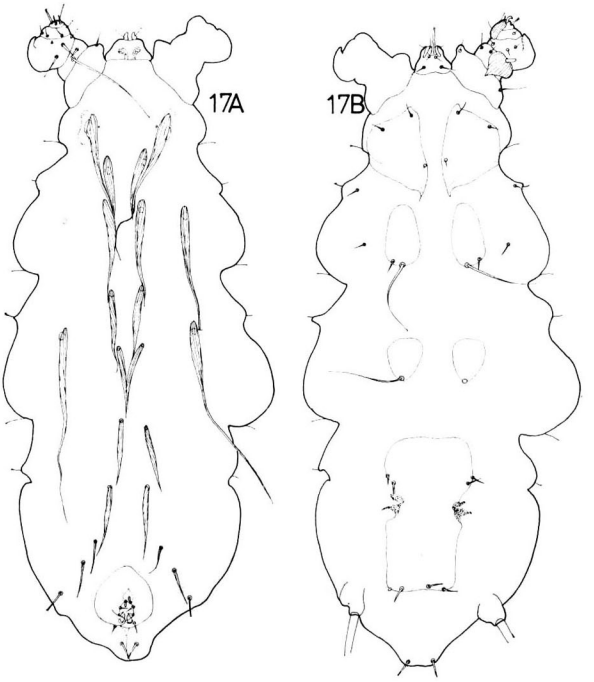

Fig. 17. *Acanthophthirius* (*Myotimyobia*) *uenoi* sp. nov., female. A–dorsum; B–venter.

UÉNO); 1 ♀ from the same host, Tsushima, Nagasaki Pref., Japan, June 1966.

The holotype and allotype are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo (NSMT-Ac 9347, 9348), and the other specimens in the collection of the author.

Notes. Although only the damaged mites from the fur specimens of the bat deposited in the National Science Museum (Nat. Hist.), Tokyo, were available in the present study, the male genital shield and female opisthogastric sclerites suggested clearly the validity of the present new species.

It was a great pleasure of the author to name the mite after Dr. Shun-Ichi UÉNO, an experienced entomologist in the National Science Museum (Nat. Hist.), Tokyo, who had collected the host bat that yielded the types of the present species.

20. ***Acanthophthirius* (*Myotimyobia*) *murinus asimilis*** subsp. nov.

(Figs. 18 and 19–19)

Male (Fig. 18). Dorsal setae d_2 long, tapering gradually and extending beyond basal level of d_4. Genital shield bearing 4 pairs of minute setae, inclusive of a peg-like one (Fig. 18B). Other formations of all parts essentially as those of nominate form.

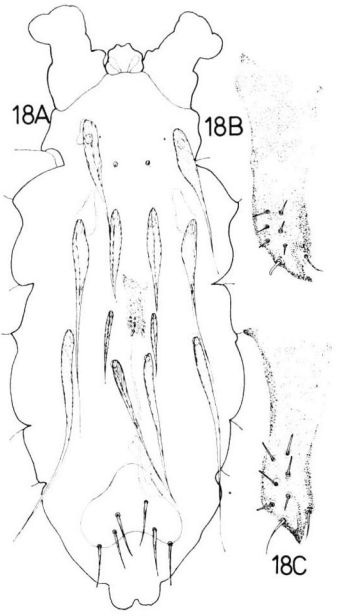

Fig. 18. *Acanthophthirius* (*Myotimyobia*) *murinus asimilis* subsp. nov., male. A–dorsum; B–genital shield. *Acanthophthirius* (*Myotimyobia*) *murinus murinus* UCHIKAWA, 1979, male. C–genital shield.

Measurements in microns (holotype and 3 paratypes): Body 560 (510–600) long by 230 (190–240) wide; *ve* 150 (160–165) long; *sc i* 105 (110–113); *sc e* 215 (210–225); d_1 70 (70–85); d_2 163 (155–165); d_4 35 (30–38); d_5 48 (35–43); l_1 215 (220–225); l_4 45 (38–48); ic_2 110 (85–100); ic_3 95 (80–93); ic_4 15 (15–20).

Famale. Essentially the same to nominate form. Dorsal setae d_5 slightly longer and thicker than d_4.

Measurements in microns (allotype and 3 paratypes): Body 650 (630–665) long by 260 (260–270) wide; *vi* 95 (95–103) long; *ve* 165 (145–148); *sc i* 118 (110–123); *sc e* 235 (210–225); d_1? (103–118); d_2 105 (95–103); d_3 88 (85–90); d_4 53 (50–57); d_5 55 (55–70); l_1 243 (228–230); l_2 105 (95–105); l_4 30 (45–50); ic_2 103 (95–100); ic_3 100 (93–98); ic_4 33 (28–33); ic_4-opisthogastric sclerite 25 (25–25); opisthogastric sclerite-g_1 110 (113–120); distance between sclerites 120 (115–120).

Material examined. Holotype male, allotyoe female, 2 paratype males and 3 paratype females ex *Murina leucogaster*, Higashinose Village, Osaka-fu, Japan, June 1976 (coll. Dr. K. MAEDA); a paratype male from the same host, Rikuzen-takada City, Iwate Pref., date uncertain; 1 ♀ from the same host, Hiroshima Pref., 8 May 1977 (coll. Dr. K. ANDO).

The holotype and allotype are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo (NSMT-Ac 9362, 9363), and the other types in the collection of the author.

Notes. The present new subspecies is very close to the nominate form that parasitized *Murina aurata*, but is distinctive in having the setae d_1 of different size and nature, and a peg-like seta on the genital shield in the male. The dorsal setae d_1 are stout and abruptly tapered, and the corresponding seta on the genital shield is setiform in the male of *A.* (*M.*) *murinus murinus* UCHIKAWA.

Additional Data and Errata

Acanthophthirius vespertilionis was allocated to the subgenus *Myotimyobia* FAIN in the original description (UCHIKAWA, 1979). The male of this species bears very weak cuticular expansion laterally between legs III and IV and legs II weakly swollen at middle. Although these properties are not so prominent, the mite should be relegated to the nominate subgenus, *Acanthophthirius* PERKINS. The host of *Acanthophthirius* (*Acanthophthirius*) *vespertilionis* UCHIKAWA was erroniously recorded as *Vespertiriolo superans*, which should be claimed for *Vespertilio orientalis*, in the previous paper (UCHIKAWA, 1979). The mite was also recorded from the real *V. sperans* as follows: 1 ♂, 2 ♀♀ and a tritonymph, Fukuoka Pref., 1 August 1978 (coll. Dr. K. ANDO); 1 ♀, Tsuruga Peninsula, Fukui Pref., 6 July 1979 (coll. Dr. M. HARADA).

At last, "13 species and subspecies, inclusive of 3 anonymous ones known only from either sex" and "21 species" on the first page of the present paper (Bull. Natn. Sci. Mus., ser. A, 7(3): 135) should be read "12 species and subspecies, inclusive of an anonymous female" and "20 species", respectively.

Discussion

All the Japanese *Acanthophthirius* mites representing the 3 subgenera and their hosts are rearranged in Table 1, and the male genital shields drawn in the same scale are presented in Fig. 19.

The mites of the subgenus *Acanthophthirius* PERKINS are parasitic on the bats of the genera *Plecotus*, *Nyctalus* and *Vespertilio*, and the mites of the subgenus *Chiromyobia* FAIN are specific to the bats of the genus *Pipistrellus*. On the other hand, the mites of the subgenus *Myotimyobia* FAIN are prevalent on the bats of the genera *Barbastella*, *Eptesicus*, *Myotis* and *Murina*. Although the subgeneric differentiation of the mites seems to have been accomplished to some extent on plylogenetically related groups of host bats, the mites of the subgenus *Myotimyobia* FAIN infest so diverse bat genera. When the structure of the male genital shield is adopted for grouping all the known Japanese *Acanthophthirius* mites, three subgroups are recognisable regardless of the subgenera defined principally on external morphology. The mites parasitizing the bats of the genera *Nyctalus*, *Vespertilio*, *Pipistrellus*, *Plecotitus*, *Barbastella* and *Eptesicus* bear essentially the same genital shields with a pair of slightly asymmetrical posterior lobes and 4 pairs of minute setae as shown in Figure 19, 1–8. On the other hand, the mites occurring on the bats of the genus *Myotis*

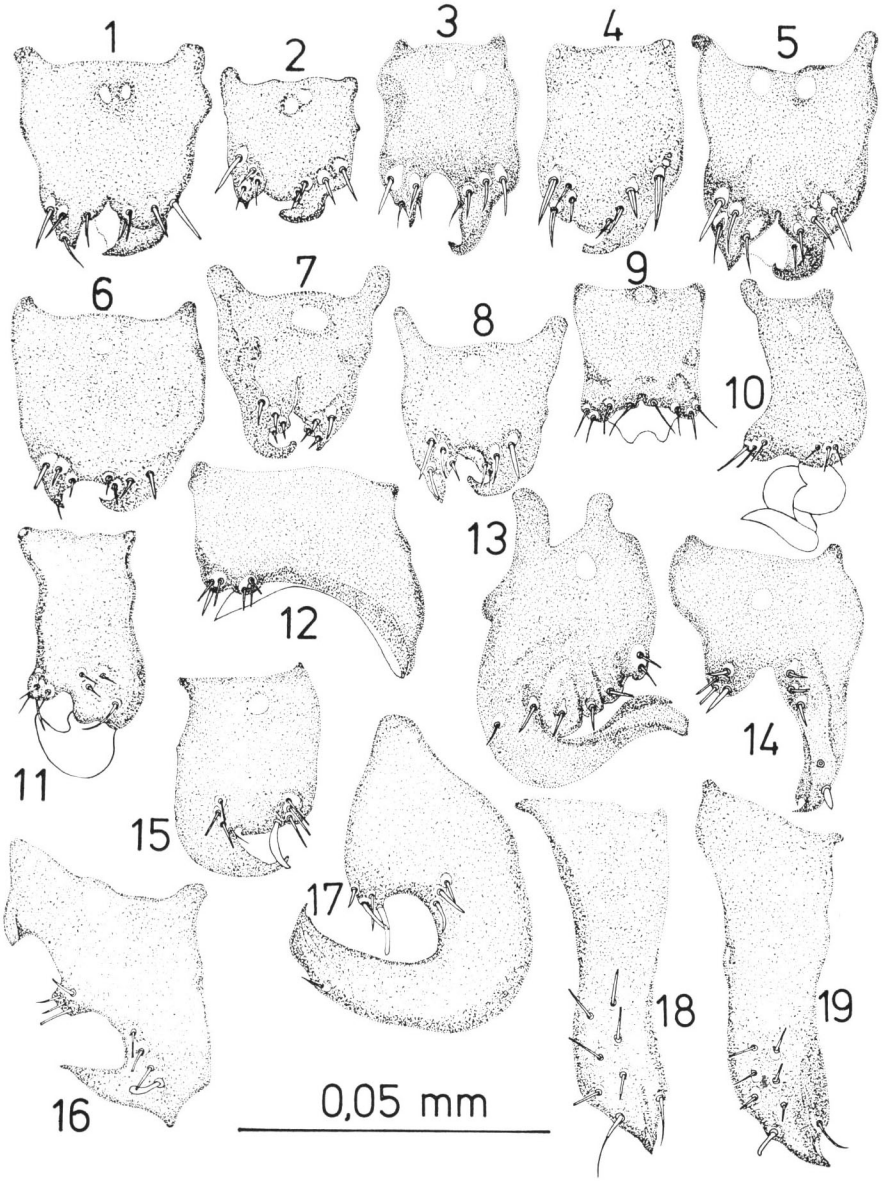

Fig. 19. Genital shields drawn in the same scale. 1. *A.* (*A.*) *noctulius* ex *N. lasiopterus*, 2. *A.* (*A.*) *yoshiyukiae* ex *N. furvus*, 3. *A.* (*P.*) *luzonensis septentrionalis* ex *P. abramus*, 4. *A.* (*P.*) *luzonensis endoi* ex *P. endoi*, 5. *A.* (*M.*) *vespertilionis* ex *V. orientalis* and *V. superans*, 6. *A.* (*A.*) *plecotius* ex *P. auritus*, 7. *A.* (*M.*) *pantopus* ex *B. leucomelas*, 8. *A.* (*M.*) *helveticus* ex *E. nilssoni parvus* and *E. japonensis*, 9. *A.* (*M.*) *iriei* ex *M. macrodactylus*, 10. *A.* (*M.*) *spiralis* ex *M. daubentoni*, 11. *Acanthophthirius* (*M.*) *pruinosi* ex *M. pruinosus*, 12. *A.* (*M.*) *hosonoi* ex *M. hosonoi*, 13. *A.* (*M.*) *spinipes* ex *M. macrodactylus*, 14. *A.* (*M.*) *simplex* ex *M. nattereri*, 15. *A.* (*M.*) *mystacinoides* ex *M. mystacinus*, 16. *A.* (*M.*) *hamatus* ex *M. frater*, 17. *A.* (*M.*) *uenoi* ex *M. formosus*, 18. *A.* (*M.*) *murinus murinus* ex *Murina aurata*, 19. *A.* (*M.*) *murinus asimilis* ex *Murina leucogaster*.

bear either the symmetrical shields sometimes with a posterior appendage (Fig. 19, 9–11) or strongly asymmetrical ones (Fig. 19, 12–17). And the synhospitalic mites on *Myotis macrodactylus* represent either type (Fig. 19, 9 and 13). The mites from the bats of the genus *Murina* are distinguishing in having the elongate genital shield (Fig. 19, 18–19) quite different from the above three types. The above grouping of the bat genera is more suggestive of the phylogenetic relations than the division according to the subgenera of the mites, though the adopting criterion is least remarkable.

NUTTING and DESCH (1979) successfully adopted the internal sclerotized structure, opistho-organ, of demodicid mites for the analysis of mammal-mite phylogeny. Such a useful internal structure has not yet been found out in *Acanthophthirius* mites, but the opisthogastric sclerite of the female deserves to be payed much attention. This internal structure of unknown function, though FAIN (1978) suggested that it might be an insemination organ, is strongly variable species to species in the mites parasitic on the bats of the genus *Myotis*, and serves as one of the good criteria for separating these mite species. Contrary to this, the female mites from the bats of the genera *Nyctalus*, *Pipistrellus* and *Vespertilio* bear essentially the same sclerites that are shown as an example in Fig. 3B for *A.* (*A.*) *yoshiyukiae* sp. nov. The sclerites are slight different from the above and almost the same to those for *A.* (*M.*) *pantopus* (POPPE et TROUESSART) from *Barbastella* (Fig. 6B) in the mites occurring on *Plecotius*

Table 1. List of *Acanthophthirius* mites from Japan and their host bats.

Subgenus	Species	Host
I *Acanthophthirius*	1. *noctulius*	*Nyctalus lasiopterus*
	2. *yoshiyukiae*	*N. furvus*
	3. *plecotius*	*Plecotus auritus*
	4. *vespertilionis*	*Vespertilio orientalis*
		V. superans
II *Chyromyobia*	5. *luzonensis septentrionalis*	*Pipistrellus abramus*
	6. *luzonensis andoi*	*P. andoi*
III *Myotimyobia*	7. *pantopus*	*Barbastella leucomelas*
	8. *helveticus*	*Eptesicus nilssoni parvus*
		E. japonensis
	9. *iriei*	*Myotis macrodactylus*
	10. *spinipes*	
	11. *hosonoi*	*M. hosonoi*
	12. *simplex*	*M. nattereri**
	13. *mystacinoides*	*M. mystacinus**
	14. *hamatus*	*M. frater*
	15. *spiralis*	*M. daubentoni**
	16. *uenoi*	*M. formosus*
	17. *pruinosi*	*M. pruinosus*
	18. *murinus murinus*	*Murina aurata*
	19. *murinus asimilis*	*M. leucogaster*
not determined	20. sp. 1	*Pipistrellus savaii*

* The 3 asterisked bats are associated with the different mites in Japan and Europe, respectively.

and *Eptesicus* (FAIN et AELLEN, 1979). As the internal organs may be less variable in evolution than adaptive external properties (NUTTING et DESCH, 1979), the similarity and divergence of the sclerite suggest the phylogenetic relations of mites and, moreover, those among their host bats. Thus, one of the 3 groups of *Acanthophthirius* mites divided by the structure of the male genital shield can be further subdivided into 2 subgroups adopting the female opisthogastric sclerite as a criterion.

The informations on the phylogeny of Chiroptera are provided with from many fields of studies. From the parasitology, adopting *Acanthophthirius* as indicators, it is, thus, interpreted that *Vespertilionidae* distributed in Japan and represented by the 8 genera are consisted of the 3 phylogenetically different groups. The genera *Nyctalus*, *Pipistrellus* and *Vespertilio* are close to each other, and constitute a group together with the other 3 genera, *Plecotus*, *Barbastella* and *Eptesicus*, which are closer to each other than to the former 3 genera. The other 2 groups are the genera *Myotis* that is thriving in Japan and *Murina*. Relative phylogenetic remotenesses among the 3 groups can not be determined by any of mite properties.

Informations of the species level on phylogeny and systematics of host bats can be also drawn out from the mites. Almost all mites are rigidly host species specific as summarized in Table 1. The 4 species, *A.* (*A.*) *plecotius* (RADFORD), *A.* (*A.*) *noctulius* (RADFORD), *A.* (*M.*) *pantopus* (POPPE & TROUESSART) and *A.* (*M.*) *helveticus* FAIN & AELLEN, occur also in Europe. The first and second mites from Japan show a minor but clear difference in having a pair of shorter ventral setae, ic_2 or ic_4, as compared with European specimens. This gap in the setal size is expected to be filled up by examining serial specimens from the region between Europe and Japan. The other two are quite the same morphologically in Europe and Japan. When bats differ from one another by the subspecies level, such bats usually share an *Acanthophthirius* mite, and this is the case of the hosts of *A.* (*A.*) *plecotius* and *A.* (*M.*) *helveticus*. It is not curious to presume that differences in the hosts of *A.* (*A.*) *noctulius*, *N. lasiopterus* in Japan and *P. noctula* in Europe, may be of the subspecies level. The bat, *Nyctalus furvus*, was originally described as the species clearly different from bats of the *lasiopterus* group and very close to European *N. noctule* (IMAIZUMI & YOSHIYUKI, 1968). The parasitic mites show, however, that *N. furvus* is distinctive and that not this bat but so far named *N. lasiopterus* from Japan is very close to *N. noctula*.

Another mite parasitic on *M. macrodactylus* in Japan, *M.* (*A.*) *spinipes* FAIN, was described on the female from *Myotis longipes* from Kashmir. From the same reason as the above, the bats from the 2 localies and named differently are thought to be close to each other. It is likely to anticipate that differences of the 2 bat forms are of the subspecies level at the most.

A. (*M.*) *vespertilionis* UCHIKAWA is shared by *V. orientalis* and *V. superans*, and *A.* (*M.*) *helveticus* FAIN & AELLEN by *E. nilssoni parvus* and *E. japonensis*. Although the different specific names have so far been claimed for the 2 sets of host bats, respectively, reconfirmation is necessary.

All the other mites are as yet known only from Japan. This suggests that some

bat species are characteristic of only Japan, and that bats closely allied to species distributed in Japan have not so far been examined for *Acanthophthirius* in adjacent countries in Palaearctic and Oriental regions. The parasitic mites on *Myotis nattereri*, *M. daubentoni* and *M. mystacinus* are different, respectively, in Japan and Europe. It is reasonable to presume that the 3 bats of the above names distributed in Japan are different from corresponding, true species occurring in Europe.

Some of the above informations on the phylogeny and validity of the host bats may be contradictry to those provided with other fields of chiropterology. All the informations should, however, be taken into account by any chiropterologist as those proposed from a side of parasitology. As noted before, the fauna of bats is not fully been clarified yet in Japan. Some more species are still expected to be newly added to the fauna. *Acanthophthirius* of becoming bat species may show validity and systematic position of such bats as in the cases of the mites of the known bats.

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