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A New Species of *Lipoptena* (Diptera, Hippoboscidae) from the Japanese Deer

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Synopsis A new species of hippoboscid fly belonging to the genus *Lipoptena* is described. This is the second species of this genus parasitic on the Japanese deer *Cervus nippon* in Japan.

The genus *Lipoptena* is a group of blood-sucking flies parasitic on various ruminants. In Japan *L. fortisetosa* MAA which was described on the basis of the specimens collected from the Japanese deer *Cervus nippon nippon* in Nara Park, had been the only sure representative of these curious flies. Recently the author collected a few specimens of *Lipoptena* by examining the type-host of *fortisetosa* in the type-locality and was much surprised in finding that the specimens were quite different from *L. fortisetosa*, because it is usual that only one species of *Lipoptena* is parasitic on one host species in one region. A close examination of these and some additional specimens collected in Kinkazan, an offshore islet in Miyagi Pref. well known as a habitat of the Japanese deer, has revealed that they clearly represent an undescribed species. A description and some notes on the new species are given in the following lines. Averages of setal numbers are in parentheses.

Lipoptena sikae sp. nov.

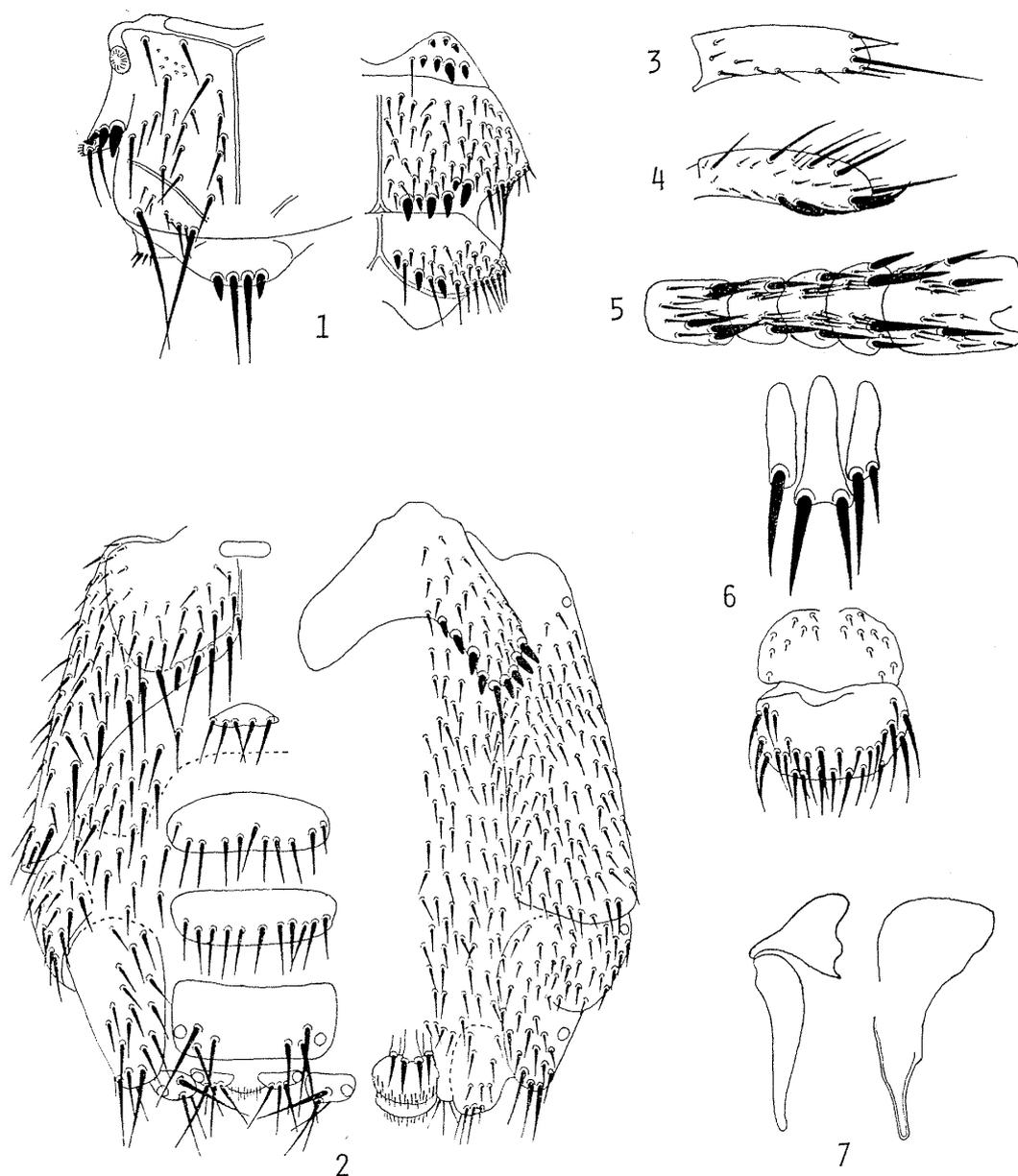
[Japanese name: Kuro-shika-shiramibae]

Description. Body dark brown, length (head+thorax) 1.8 mm. Head strongly narrowed behind eyes. Eye large, distinctly narrowed behind, laterally not reaching margin of head. Inner orbit ca. 2/3 as wide as eye, with 1 vertical, 2 orbitals and 3-6 (4.8) short setae. Postvertex ca. 4× as wide as long; ocellar triangular; ocelli elliptical; mediovertex nearly as wide as long. Palpus distinctly longer than antennal pit, in lateral view ca. 4× as long as wide and with upper and lower margins gently arcuate. Thorax: Pronotum ribbon-like, anterior margin subparallel to posterior margin, the latter being angulate at middle. Median notal suture ending before level of apices of transverse mesonotal sutures which almost reach scutellum; longitudinal intrascutal groove distinct. Dorsal thoracic chaetotaxy: 3-5 (3.3) humerals; 6-8 (7.0) acrostichals; 10-12 (10.6) laterocentrals; 1-3 (2.0) postalars; 5-8 (6.1) intra-alars+prescutellars (in some cases the intra-alars are clearly definable, but more often they form a continuous serial row together with prescutellars and are

inseparable from the latter both in length and arrangement); 6–7 (6.8) mesopleurals in 2 rows; 4 (in 2 pairs) scutellars, with median ones ca. $3\times$ as long as lateral ones which are short robust spines. Prosternal lobe ca. $2\times$ as wide as long, anteriorly narrowly rounded with 1 bristle and 6–10 (7.6) short robust spines usually in 2 rows, one arranged along anterior margin while another (which contains 1 bristle) near mid-length. Mesosternum evenly setose with 2 (1+1) long bristles posterolaterally and 8–11 (9.0) short robust spines posteriorly; these very conspicuous spines are suberect, somewhat flattened, tooth-like, ca. $1.5\text{--}2.5\times$ as long as wide at their bases and are similar to short robust spine on prosternum, metabasisternum and abdominal sternite 1; metabasisternum with 2–3 rows of setae which are slightly finer than those on mesosternum, setae of hindmost row much longer and bristle-like and 2–7 (3.7) of them replaced by short robust spines similar to those on posterior part of mesosternum.

Wing 4.8 mm long, similar to that of *L. cervi* (LINNÉ) in shape and venation; apex of R_1 situated slightly basad to level of R_{4+5} and *rm* junction which lies near midpoint of R_{4+5} , C with 20–22 (21.0) setulae for 1 ♀ and 25–27 (25.8) for 2 ♂♂ between apices of R_1 and R_{4+5} , apically more densely setulose. Legs setose. Femur 1 with 3–5 (3.9) dorsal, 1 anterior and 2 posterior erect bristles; femur 2 with 3–4 (3.4) dorsal and 1 posterior bristles; femur 3 ca. $1.3\times$ as long as 2, with 7–10 (8.6) dorsal and 1 anterior bristles. Tibia 1 with 1 major apical spur while tibia 2 with 1 major and 1 minor one, the latter ca. $1/2$ as long as the former; tibia 3 with 5–6 (5.2) erect bristles dorsally, 2 long gently curved spines anteroventrally, 1 major and 3 minor spurs apically (the latter ca. $2/3$ as long as the former) and 2 long bristles besides spurs (posterior one very long whereas interior one shorter and often spur-like). Tarsomeres 4 and 5 of leg 3 with 3–5 (4.0) and 3 plantar spines respectively; anterior pulvilli of all legs less than $1/2$ as long as corresponding posterior pulvilli and only reaching level of apex of basal heel of corresponding anterior claw; anterior claws of all legs longer than posterior claws.

♀ Abdomen: Pleurite 1 as long as wide, outer margin gently curved and much longer than gently curved inner margin, posterior margin nearly straight, surface with 2–3 rows of setae; dorsum of pleurite 2 evenly setose, very long, strongly tapering apicad, apex subacute, inner and outer margin nearly straight, the latter ca. $2.5\times$ as long as width of pleurite 1; in engorged specimens, dorsum of pleurite 3 clearly separated from pleurite 4, ca. $1/2$ as large as the latter, evenly setose; dorsum of pleurite 4 ca. $2\times$ as long as wide, posteriorly and interiorly setose; dorsum of pleurite 5 small. Remnant of tergite 1 transversely linear; tergite 3 large, horseshoe-shaped, medially with a small flattened triangular plate bearing 4–6 (5.3) setae, remaining area darkened, transversely striated and with 3–4 oblique rows of setae; tergites 4–6 posteriorly bearing 10–12 (11.0), 10–13 (11.0), 5–6 (5.7) setae respectively; tergites 4–6 subequal in width, but 6 longer than others; tergite 7 widely divided into 2 roundish pieces, each bearing 3–4 (3.3) setae. Supra-anal plate with 1–2 rows of short setae. Sternite 1 posteriorly semicircularly curved, its outer margin straight



Figs. 1-7. *Liptoptena sikae* sp. nov. — 1. ♀ Thorax, dorsal (left) and ventral (right) views. — 2. ♀ Abdomen, dorsal (left) and ventral (right) views. — 3. ♀ Palpus, lateral view. — 4. ♀ Hind femur, anterior view. — 5. ♀ Hind tarsus, ventral view. — 6. ♀ Terminalia, ventral view. — 7. ♂ Genitalia, aedeagus (left) and paramere (right), both lateral view. Figs. 1, 2, 4 and 7 in same scale, 3, 5 and 6 more enlarged, 3 and 6 in same scale, but 5 in different scale. Figs. 1, 2 and 6 based upon holotype, 7 based upon allotype, 3-5 based upon paratype from Kinkazan.

or very weakly curved at basal 2/3, from thence subangularly curved into more strongly curved another 1/3, length of posterior lobe about as long as median length of sternite itself. Venter of pleurite 2 almost evenly broad with broadly rounded apex; venter of pleurite 3 ca. 1/2 as long as pleurite 4. Venter of pleurite 4 large, anteriorly extending and reaching same level as pleurite 3. Setae on ventral membrane nearly uniform in length and robustness. Pregenital plate long, median one posteriorly with 2, while lateral ones with 1-2 (1.3) setae; setae on pregenital plates (except for shorter ones on laterals if exist) more robust than those on ventral membrane. Postgenital plate with 1-2 rows of setulae. Infra-anal plate posteriorly and laterally with 2-3 rows of short setae. ♂ Abdomen almost similar. Posterior margin of pleurite 1 gently curved; pleurite 2 relatively shorter, not so strongly tapering apicad as in ♀, its outer margin ca. 2× as long as width of pleurite 1; pleurites 3-5 undefinable. Tergite 6+7 with 3-5 (3.2) setae on each side. Genitalia as figured. Postgenital plate roughly rectangular.

Holotype (♀), Nara Park, Nara Pref., Honshu, Japan ex *Cervus (Sika) nippon nippon*, 4. IV. 1974, M. MOGI. Allotype (♂), paratype 1 ♀, same data as holotype. Paratypes, 4 ♂♂, 1 ♀, Kinkazan, Miyagi Pref., Honshu, Japan, date uncertain, but collected in autumn in the habitat of the same deer, R. SONOBE. The Nara specimens are de-alate whereas the Miyagi specimens are alate (2 ♂♂, 1 ♀) and freshly de-alate (2 ♂♂). The type-series including the holotype will be preserved in the National Science Museum, Tokyo, except for 1 paratype (♀ from Nara) which will be preserved in the B. P. Bishop Museum, Hawaii.

Distribution. At present known only from Honshu, Japan.

Remarks. The most conspicuous character of this new species is the presence of suberect, flattened, tooth-like spines on thoracic sterna and abdominal sternite 1. For this unique character *sikae* is separable from any other known species of *Lipoptena*.

Two species of the genus *Lipoptena* has hitherto been recorded from Japan under three names (MAA, 1967), but as afore-mentioned, *L. fortisetosa* is the only one which certainly occurs in Japan at present. Discrimination of the new species from *fortisetosa* is very easy. It is not only quite different in many microscopic characteristics including unique tooth-like spines, but also may be separable at a glance, even by the naked eye. The new species is larger and usually dark brown, while *fortisetosa* is smaller (head+thorax length 1.3 mm), usually light brown.

It is rather unusual that two *Lipoptena* species occur on the same host in the same region, but the coexistence of *sikae* and *fortisetosa* on *Cervus nippon*, at least, in Honshu seems to be undoubted, because in Japan *Cervus nippon* is the only representative of Cervidae which is the primary hosts of the *cervi*-group of MAA (1969) to which *sikae* and *fortisetosa* belong. Actually, the holo- and allotypes of both the species were collected from *Cervus nippon nippon* in Nara; on the other hand, *fortisetosa* has been collected by Dr. NAKANE and Mr. SONOBE in Kinkazan where a part of the paratypes of *sikae* were collected. This coexistence of two *Lipoptena* offers very interesting problems.

The first is ecological differences between these two species. According to Mr. SONOBE, alate form of each species can be collected in different season, i.e., *fortisetosa* in midsummer, while *sikae* in late autumn. If both the species are univoltine as *L. cervi* (LINNÉ) in Europe, de-alate form of them may be found together on the deer during winter, because de-alate type specimens of *sikae* and *fortisetosa* were collected in April and June respectively from the deer in Nara. The author has no other knowledge about ecology of these species, but they probably differ in many respects and some may be expected from morphological differences. The thickness of thorax is quite different between the two species. In *fortisetosa* the thorax in alate male is more than 2/3 as thick as long (measured from the middle of anterior margin of pronotum to posterior margin of scutellum), while in *sikae* only 1/2, more flattened than in the former and probably shows relatively weak flight ability.

Another interesting problem is the process through which the two *Liptoptena* species came to be parasitic together on the Japanese deer. It is quite unknown at present, but it has probably close relations with the history of Cervidae in Japan. Our present knowledge on the geographical and ecological distribution of the two species in Japan and the Continent is too scarce to speculate on this problem. In such speculation, the possibility of artificial introduction might be considered, because the Japanese deer has not only been introduced repeatedly from a certain place to another in Japan for rearing in parks and zoos, but also introduced and now established in Europe and New Zealand.

Another species of *Liptoptena* having been recorded from Japan is *L. japonica* BEQUAERT. It is known only by the unique type-specimen said to have been collected from the Japanese serow *Capricornis crispus crispus* in Honshu, but "the authenticity of this record needs verification" (MAA, 1969). The author once tried to examine the Japanese serow reared near their natural habitat, but could not find any *Liptoptena* at that time, but more extensive examinations are necessary to reveal the true status of *japonica*.

Appendix. *Liptoptena fortisetosa* MAA was described based upon de-alate forms and its wing has been undescribed, so it is added here based upon 3 ♂♂ collected in Kinkazan. It is similar to that of *L. cervi* (LINNÉ) but much smaller and having fewer setulae, 3.0–3.1 (3.0) mm long and C with only 12–15 (13.0) setulae between apices of R₁ and R₄₊₅.

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