

The Lampyrid Beetles of the Genus *Stenocladius* (Coleoptera,
Lampyridae) of the Ryukyu Islands, Southwest Japan,
with Descriptions of Two New Species

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Abstract The lampyrid beetles of the genus *Stenocladius* from the Ryukyu Islands, Southwest Japan, are revised. Two new species are described and illustrated: *S. yoshimasai* sp. nov. from Amami-Oshima Is. of the Amami group and *S. flavipennis* sp. nov. from Kume-jima Is. of the Okinawa group. The male right antennae and the male genitalia of all the species are illustrated and a key to them is provided.

The genus *Stenocladius* belongs to the lampyrid subfamily Otoretinae together with the genus *Drilaster*. Twenty-two species have been described from Southeast Asia, and three species have previously been known from the Ryukyu Islands of Japan (NAKANE, 1981, 1983, 1997; OHBA, 1986, 1998; SATÔ, 1985). The adult males are characterized by the following points: body not so flattened and slender; head not concealed completely by pronotum, pectinate antennae long and large, particularly the flagellum except apical segment with long pectinae, forming a comb-like shape as a whole.

Recently, SUZUKI (1997) reported in his molecular phylogenetic studies of Japanese fireflies that *Drilaster* and *Stenocladius* did not form a cluster, but that the latter formed a cluster with the genus *Rhagophthalmus* of the family Rhagophthalmidae. The adult female had been unknown, but OHBA *et al.* (1997) explained for the first time the morphology of the unique larviform female and the mating behavior of several species of the genus.

I had opportunities to examine and revise the *Stenocladius* species from the Ryukyu Islands. After a careful examination, it has become clear that two additional species occur in the archipelago. They must be new to science, and will be described in this paper. The abbreviations used herein are as follows: HW – maximum width of head, including eyes; PW – maximum width of pronotum; PL – length of pronotum, measured along the mid-line; EW – humeral width of elytra; EL – maximum length of elytra; YCM – Yokosuka City Museum Insect Collection.

Genus *Stenocladius* FAIRMAIRE

Stenocladius FAIRMAIRE, 1878, Anns. Soc. ent. Fr., (5), **8**: 112–113. (Type species: *Stenocladius davidi*;

Chine, by monotypy.)
Hydaspes BOURGEOIS, 1890, *Annls. Soc. ent. Fr.*, (6), **10**: 171–172. (Type species: *Hydaspes fairmairei*; Cochinchine, by monotypy.)

The Japanese species of this genus are very similar to one another in morphological characters including those of male genitalia. Common external characters are as follows.

Male. Medium-sized species of slender habitus, with long appendages. Body elongate, subparallel-sided and weakly depressed; integument weakly sclerotized; head relatively large but pronotum small; hind body long and slender; antennae very long and slender, pectinate in segments 3–10; all legs long and rather slender. Body almost shiny, regularly clothed with pale subrecumbent pubescence; antennal flagellum, maxillary and labial palpi, tibiae and tarsi frosted, more densely covered with very minute subrecumbent setae.

Head large, a little wider than long, depressed above, rather coarsely punctate on dorsal surface. Antennal sockets located on both sides of elevated frontal area, only a little separated from each other, distinctly oriented anteriorly, not visible from dorsal side. Antennae long and slender, extending beyond the middle of elytra, with flagellar segments 1–8 pectinate; each pectina arisen from the basal part of the stem, very elongated spatular and 2 to 6 times as long as the stem itself according to species; each stem subcylindrical and very weakly constricted at the middle; terminal flagellum simply spatular, distinctly longer than any of the other segments; scape short, subcylindrical or clavate, widest at the apex, more or less bent outside; pedicel much reduced and the shortest, almost as long as wide, but more or less varying individually in relative length of each stem and pectina. Eyes globular, large and prominent, distinctly separated from each other by a width 1 to 1.5 times the diameter of eye in dorsal view, a little apart from bases of mandibles. Labrum small and transverse, slightly dilated apically, arcuately emarginate at the centre of front margin; the anterior angles rounded. Front-clypeal suture not recognized. Mandibles small and very slender, constantly incurved, not so much pointed. Maxillary palpus 5-segmented, relatively long and slender; 1st segment the shortest; 2nd long, nearly equal in length to terminal; 3rd a little longer than 2nd; terminal bottle-shaped, with swollen basal part and abruptly acuminate from apical third, moderately blunt at the apex. Labial palpus 3-segmented and slender; 1st and 2nd segments almost equal in length; terminal spindle-shaped, almost twice as long as 2nd, moderately acute at the apex.

Pronotum relatively small and short, semicircular in dorsal view but rather variable in shape, sometimes transverse, widest just before the base, a little broader than head and distinctly narrower than the humeral width of elytra; anterior margin widely arcuate and produced anteriorly, strongly reflexed, not angulate; sides almost parallel or very faintly constricted just before the base; basal angles briefly projected outwards, each forming a minute tubercle; basal margin sublinear but moderately sinuate on both sides, narrowly bordered, transversely concave on both sides along the basal margin; disc coarsely or closely punctate, densely clothed with pale pubescence all over, nar-

rowly marginated throughout, provided with a pair of elevated and depressed areas; medio-longitudinal furrow along mid-line present in basal two-thirds. Scutellum triangular with rounded apex, punctate on the surface.

Elytra rather long, conjointly 2.70 to 2.75 times as long as wide, constantly covered with pale subrecumbent pubescence; humeri distinctly prominent anteriorly; sides parallel or subparallel though very slightly convergent posteriorly, more strongly so towards rounded apices in apical parts, distinctly dehiscent, narrowly marginated throughout including suture, the margin being concealed at humeral portion; dorsal surface distinctly rugulose, irregularly and closely punctate; each elytron with 4 vague costae, of which the 2nd costa is long but does not reach elytral apices; 3rd the longest and most conspicuous, reaching elytral apex; outermost and innermost costae short, very weak and rather obsolete. Each costa obliquely running inwards towards the elytral apex.

All legs long and slender; trochanters short, $1/3$ to $2/5$ as long as femora; femora moderately fusiform and flattened dorso-ventrally; tibiae also moderately flattened and slender, almost straight or faintly incurved. Tarsal formula 5–5–5; all tarsi almost as long as the tibiae; 1st tarsomere the longest, a little longer than the combined length of 2nd and 3rd; 4th small, deeply excavated medio-apically for the reception of the 5th; claws simple. Both tibiae and tarsi densely covered with minute subrecumbent setae. Lateral sides of metasternum almost straight.

Abdomen broad and flattened, with 8 visible segments in ventral view; sides of 2nd to 4th segments almost parallel and then gradually convergent from the 5th to anal end; 8th sternite very small, rounded or moderately truncated at the apex.

Male genitalia very weakly sclerotized, trilobed and almost symmetrical, more or less variable in the shape individually. Aedeagus stout, rather flattened dorso-ventrally, constantly bent dorsad; sides gradually convergent from near the middle; apex rounded or moderately truncated; ventral surface bearing membranous sac-like organ just behind the middle. Parameres clearly shorter than aedeagus; each paramere apparently narrowed towards the apex and moderately pointed, the apical portions being membranous and flexible, more or less curved inwards or outwards, with many sense organs. Both parameres roundly joining at the base. Basal plate very weakly sclerotized and almost membranous, cordate as a whole, roundly projected on each side of anterior margin and deeply emarginate at the centre, the projections being sometimes moderately asymmetrical.

Female. Body almost completely larviform, elongate, cylindrical and parallel- or subparallel-sided; the integument very weakly sclerotized.

Head capsule dark reddish brown; lateral ocellar area blackish; dorsal and lateral areas decolorized around the sockets of minute setae; mouth-parts yellowish brown, with the exception of mandibles which are shiny and dark to blackish brown, paler towards the bases; antennae yellowish brown with whitish basal articulating membrane. Thorax and abdomen almost milky white to pale yellow, with intersegmental membrane translucently milky white; each body tergum becoming darker on both sides,

sometimes with a pair of brownish markings; ventral surface usually paler than dorsal. Legs yellowish brown.

Head of lampyrid larval type including mouth parts, but dorsal cleavage lines completely absent. Head capsule depressed above, coarsely bearing minute setae, widest across lateral ocellar area or at the middle; nasale area strongly depressed, with many spines on frontal margin. Labrum absent. Lateral ocelli 2 to 6 in number. Antennae short but thick, 3- or 4-segmented including scape and pedicel, gradually narrowed towards the terminal segment; subapical segment with a transparent sense organ in the extero-ventral parts near apices; terminal one usually the shortest or minute, with several minute sense organ and setae at the apices. Mandibles constantly incurved but not so much pointed. Maxillae with 1 segment of galea and 3 segments of palpus. Cardo fused with stipes and evanescent. Labium with 2 segments of palpus, prementum dilated anteriorly, clearly excavated at the centre of anterior margin.

Thoracic segments gradually reduced in length and increased in width towards the posterior; sides divergent towards the posterior; front margin of prothorax rounded and arcuate but sometimes angulate on both sides. Episternum and epimeron recognizable. Legs thick and very robust, with many spines on venter from trochanter to 1st tarsomere. Coxae the largest and long triangular; trochanters triangular, obliquely articulated to femora; tibiae nearly a half as long as femora. Tarsal formula 2-2-2; 1st tarsomere very small; 2nd about 3 to 4 times as long as 1st, and a little longer than tibiae. Claws simple and complete, dilated at the base.

First to 7th abdominal segments almost equal in length and width, parallel- or subparallel-sided; lateroterga and pleura clearly recognized as folds; sides more or less abruptly convergent from 8th; 10th the smallest, greatly retracted into 9th, with a pair of 2-segmented cerci; 1st segment large and long, triangular in profile; 2nd very minute and papilliform.

Stenocladius yoshimasai KAWASHIMA, sp. nov.

[Japanese name: Amami-kushihige-botaru]

(Figs. 1-6, 8, 10-11, 14)

Stenocladius sp. 1: OHBA *et al.*, 1996, Sci. Rept. Yokosuka City Mus., (44): 21-22, 24-25, 28-30 (morphology and habit of larva); 1997, Sci. Rept. Yokosuka City Mus., (45): 24, 26, 30-31, 34, 36 (mating behavior and morphology of adult female). — KAWASHIMA, 1998, Nat. & Ins., Tokyo, **33**(7): 17 (morphology of adult female).

Male (Holotype). Head capsule almost blackish, tinged with yellowish coloration in frontal area. Antennae blackish. Eyes blackish with violet tint. Labrum pale yellow. Mandibles dark brown, paler towards the bases. Both maxillary and labial palpi blackish. Pronotum orange yellow. Scutellum orange yellow, tinged with dark brownish at the apex. Elytra blackish brown, becoming darker towards the bases. Clearly marginated in orange yellow throughout including the suture. Venter constantly orange yellow. All femora almost orange yellow. Tibiae and tarsi blackish brown, but tinged

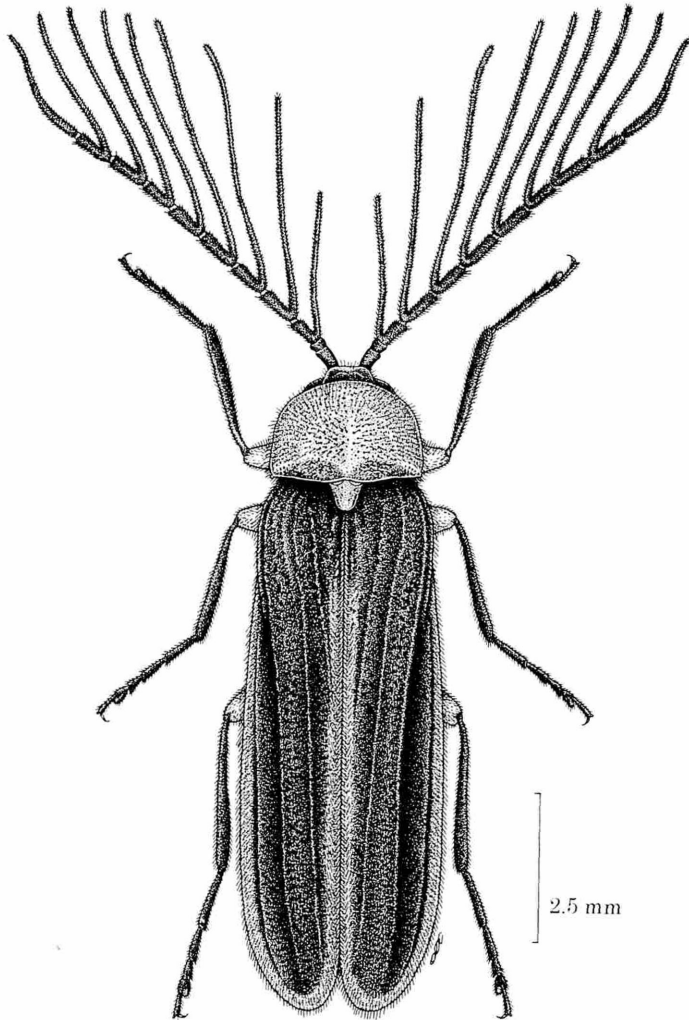


Fig. 1. *Stenocladius yoshimasai* KAWASHIMA, sp. nov., ♂; from Amami-Ohshima Is.

with yellowish brown in apical half of 5th tarsomere and claws. Body closely and constantly covered with pale subrecumbent pubescence; antennae, maxillary and labial palpi, tibiae and tarsi more densely covered with blackish minute setae.

Head a little narrower than the width of pronotum; eyes fairly small, separated from each other by 1.5 times the diameter in dorsal view. Antennae very long, reaching apical third of elytra; scape very thick and short cylindrical, not so much curved outwards, 1.2 times as long as wide; 1st to 8th flagellar segments equal or subequal in length to one another; terminal segment remarkably long, almost 3 times as long as each of 1st to 8th. Relative length of each segment as follows:— 7:4:9:11:11:11:

12:11:11:11:35. Each pectina extremely long, 4 to 6 times as long as the stem, almost 4 times in 1st, 5 to 5.5 times in 2nd, 7th and 8th, and 6 times in 3rd to 6th.

Pronotum fairly short and transversely semicircular; a little narrower than the humeral width of elytra; dorsal surface closely punctate, the punctures being relatively small; basal margin fairly straight, weakly sinuate on both sides. PW/PL 1.58; PW/HW 1.14. Scutellum coarsely punctate.

Elytra fairly slender and parallel-sided, but very slightly narrowed posteriad and rounded at the apices; dorsal surface distinctly rugose, irregularly and closely punctate; 4 vague costae of each elytron fairly distinct, the exteriormost one short but relatively clear. EL/PL 5.32; EL/EW 2.75; EW/PW 1.22.

Relative length of each tarsomere as follows:— 27:15:10:8:14 in foreleg, 32:17:11:9:18 in midleg, 40:21:12:9:18 in hindleg.

Male genitalia as shown in Figs. 10–11, fairly narrow and slender; aedeagus broad and constantly narrowed from just before the middle, with moderately truncated apex; parameres almost straight, gently divergent apicad, though the sides are almost parallel before KOH treatment. Each paramere nearly straight, faintly curved towards outside at the apices.

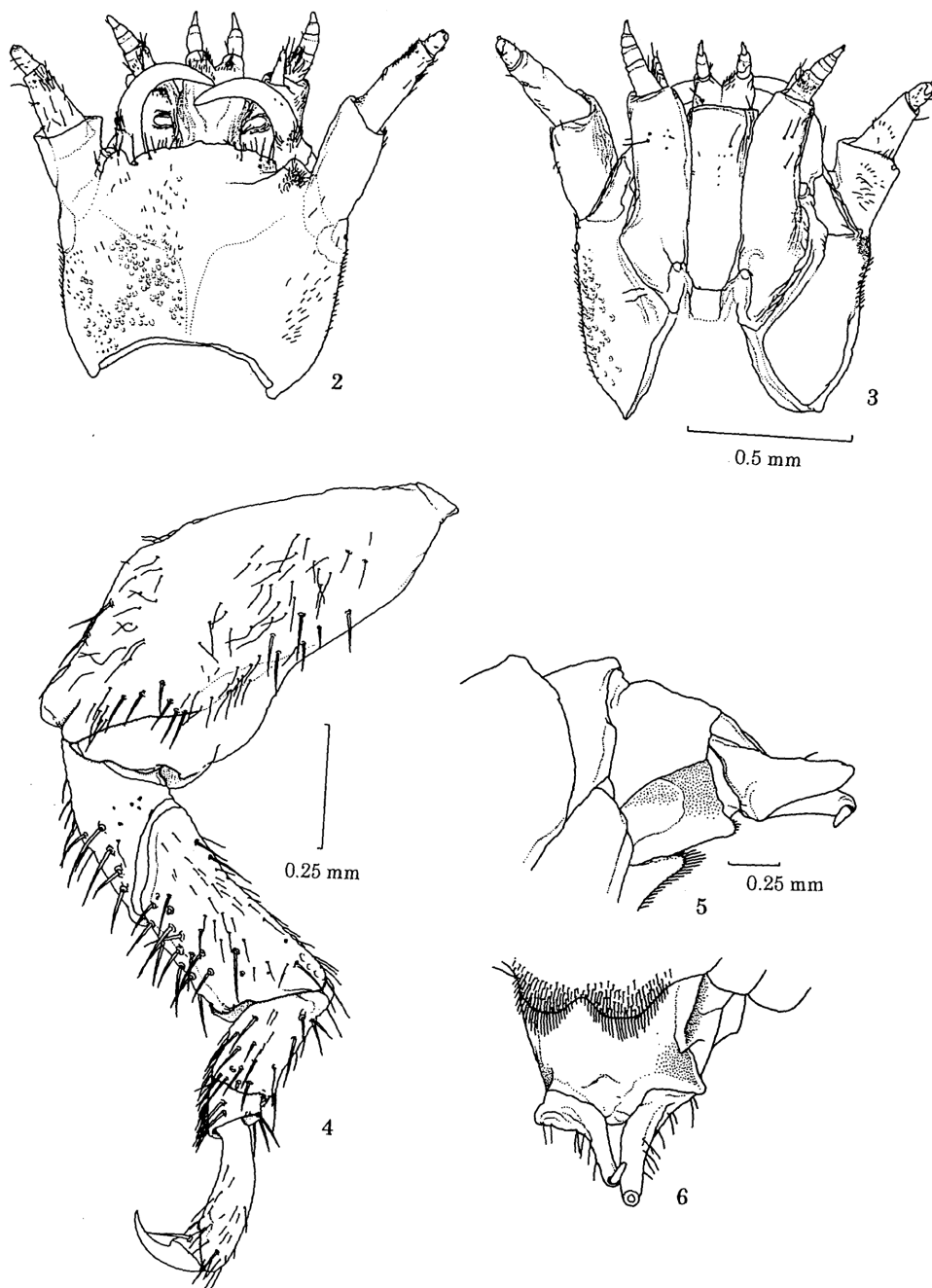
Measurement in mm. Body length (from anterior margin of frons to apices of elytra): 9.95 (in the holotype; range 8.05–9.95); maximum width of pronotum (PW, just before the base): 2.03 (2.01–2.03); length of pronotum (PL, along the mid-line): 1.36 (1.30–1.36); hind tibial length: 2.21 (1.98–2.21).

Female. Head capsule dark reddish brown. Lateral ocellar area blackish. Mouth parts yellowish brown, with the exception of mandibles which are dark to blackish brown, becoming paler towards the bases. Antennae yellowish brown, with basal antennal articulating membrane milky white to pale yellow. Thorax and abdomen constantly pale yellow to milky white with intersegmental membranous area translucently whitish, without any distinct markings, ventral surface paler than the dorsal. Legs including claws yellowish brown.

Body fairly large, much swollen in anterior to middle segments of abdomen, showing a spindle-shape as a whole. Antennae short but thick; flagellum very minute, relative length of each segment from scape as follows:— 30:10:1. Legs as shown in Fig. 4; 1st segment small and almost equal in both length and width; 2nd long and clavate, about 3 times as long as 1st; claws simple and complete, dilated at the bases. A pair of shallow but clear projections on the posterior margin of 8th abdominal sternum. Cerci arcuate outwards in half the length of 1st segment, apical half straightly elongated posteriad, not opening to the left and right.

Measurement in mm. Body length (from anterior margin of pronotum to posterior margin of 10th abdominal segment, fixed by 95% ethyl alcohol): 21.50; maximum width of head (HW, across lateral ocelli): 1.80; length of hind coxa: 0.98; length of hind femur (along the upper margin): 0.53.

Type series. Holotype: ♂, Mt. Yui-dake, Amami-Oshima Is., Amami Isls., 1–XII–1992, Y. GOTO leg. (YCM). Paratypes: 1 ♀, same locality as above, 19–VII–



Figs. 2-6. *Stenocladius yoshimasai* KAWASHIMA, sp. nov., ♀; from Amami-Ohshima Is.; dorsal view (2), ventral view (3, 6), lateral view (4, 5) — 2, 3, Head; 4, hindleg; 5, 6, apical segments of abdomen (after OHBA *et al.*, 1997).

1992 (larva collected), 21–XI–1992 (adult emerged), Y. GOTO leg. and bred; 1 ♂, same data as for the holotype; 2 ♂♂, Sude, Seto'uchi-cho, Amami-Oshima Is., Amami Isls., 30–XI–1992, Y. GOTO leg.

The holotype is deposited in the collection of the Yokosuka City Museum, Kanagawa. The paratypes are distributed to the collections of Mr. Y. GOTO and mine.

Type locality. Mt. Yui-dake, Amami-Oshima Is., Amami Isls. of the Ryukyu Archipelago.

Notes. This new species is similar to *S. shirakii* and *S. azumai* in the colour pattern of body, but it can easily be distinguished from the latter two by the larger body, relatively small eyes and short antennal scape, the much longer pectinae of antennal flagellar segments 3–10 and configuration of male genitalia. The larva and adult female were already described and figured by OHBA *et al.* (1996, 1997). General morphology of female is similar to that of *S. azumai*. It can be easily distinguished from that of *S. shirakii* by the absence of colour-markings of body, the number of antennal segments and the shape of cerci. OHBA *et al.* (1997) observed the mating behavior, which was considered “LB system” communication (OHBA, 1983).

The specific name is given after Mr. Yoshimasa GOTO, who has endeavoured to clarify the lampyrid fauna of the Ryukyu Islands and their biology.

***Stenocladius flavipennis* KAWASHIMA, sp. nov.**

[Japanese name: Shibuiro-kushihige-botaru]

(Figs. 7, 9, 12–13, 15)

Stenocladius sp. 3: OHBA *et al.*, 1996, Sci. Rept. Yokosuka City Mus., (44): 21–22, 25, 27, 28–30 (morphology and habit of larva); 1997, Sci. Rept. Yokosuka City Mus., (45): 24–25, 26–27, 34, 36 (mating behavior and morphology of adult female). — KAWASHIMA, 1998, Nat. & Ins., Tokyo, **33**(7): 17 (morphology of adult female).

Stenocladius sp.: SUZUKI, 1997, Tokyo met. Univ. Bull. nat. Hist., (3): 11, 15–16, 19, 40, 49–53 (molecular phylogeny); 1998, Nat. & Ins., Tokyo, **33**(7): 12 (molecular phylogeny).

Male (Holotype). Head capsule almost blackish, weakly tinged with brownish in frontal area. Antennae blackish. Eyes blackish with violet tint. Labrum pale yellow. Mandibles dark brown, paler towards the bases. Both maxillary and labial palpi blackish. Pronotum almost blackish brown, tinged with brownish on both sides. Scutellum blackish brown. Elytra yellowish brown, becoming weakly darker near the bases. Coxae and trochanters dark brownish; femora yellowish brown, tinged with blackish brown along the anterior margin. Tibiae and tarsi blackish brown, but the apices of 5th tarsomere and claws are tinged with pale yellowish brown. Ventral surface yellowish brown except for meso- and metathoraces dark brown.

Head narrower than the width of pronotum; eyes moderately small, separated by 1 to 1.5 times the diameter from each other in dorsal. Antennae moderately long, extending beyond the middle of elytra; scape short and clavate, 1.6 times as long as wide, clearly bent outwards in apices; 2nd flagellar segment twice as long as 1st; terminal

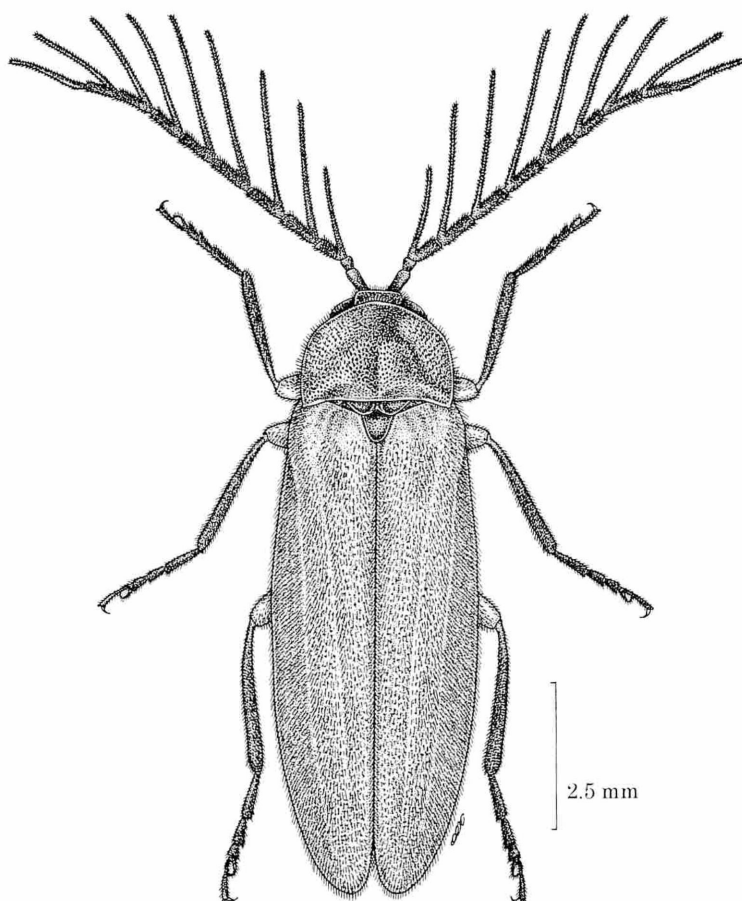


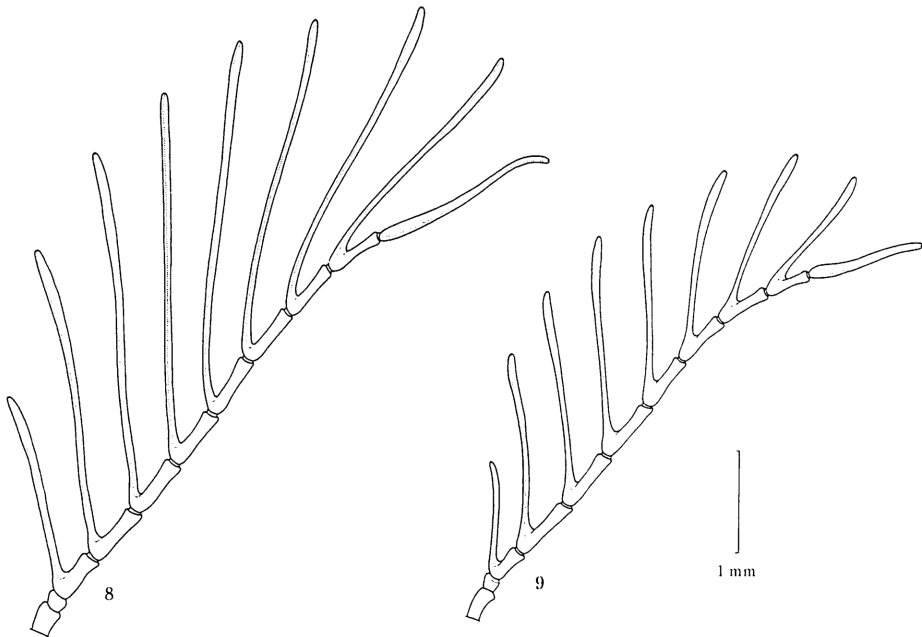
Fig. 7. *Stenocladius flavipennis* KAWASHIMA, sp. nov., ♂; from Kume-jima Is.

9th almost twice as long as the length of 5th or 6th. Relative length of each segment as follows:— 8:3:7:14:13:13:12:12:12:11:27. Each pectina almost 3 times as long as the stem.

Pronotum short and semicircular, a little narrower than the humeral width of elytra; dorsal surface closely punctate, the punctures being fairly large; basal margin nearly straight, weakly sinuate on both sides. PW/PL 1.53; PW/HW 1.44. Scutellum closely punctate.

Elytra broader and subparallel-sided, weakly dilated to apical third, and then narrowed to rounded apices; dorsal surface distinctly rugulose, irregularly and closely punctate; 4 vague costae of each elytron more obsolete; the exteriormost one almost evanescent. EL/PL 4.80; EL/EW 2.69; EW/PW 1.20.

Relative length of each tarsomere as follows:— 24:12:9:8:13 in foreleg, 26:13:10:9:15 in midleg, 32:17:10:7:16 in hindleg.



Figs. 8–9. Right male antennae of *Stenocladus* spp. — 8. *S. yoshimasai* KAWASHIMA, sp. nov., from Amami-Ohshima Is. — 9. *S. flavipennis* KAWASHIMA, sp. nov., from Kume-jima Is.

Male genitalia as shown in Figs. 12–13; sides of aedeagus gradually convergent towards the apex from just before the middle; each paramere nearly straight; the apices not so much bent inwards, gradually opened toward the apices.

Measurement in mm. Body length (from anterior margin of frons to apices of elytra): 8.90 (in the holotype; range 8.30–9.70); maximum width of pronotum (PW, just before the base): 2.30 (2.04–2.39); length of pronotum (PL, along the mid-line): 1.50 (1.41–1.54); hind tibial length: 2.20 (2.08–2.30).

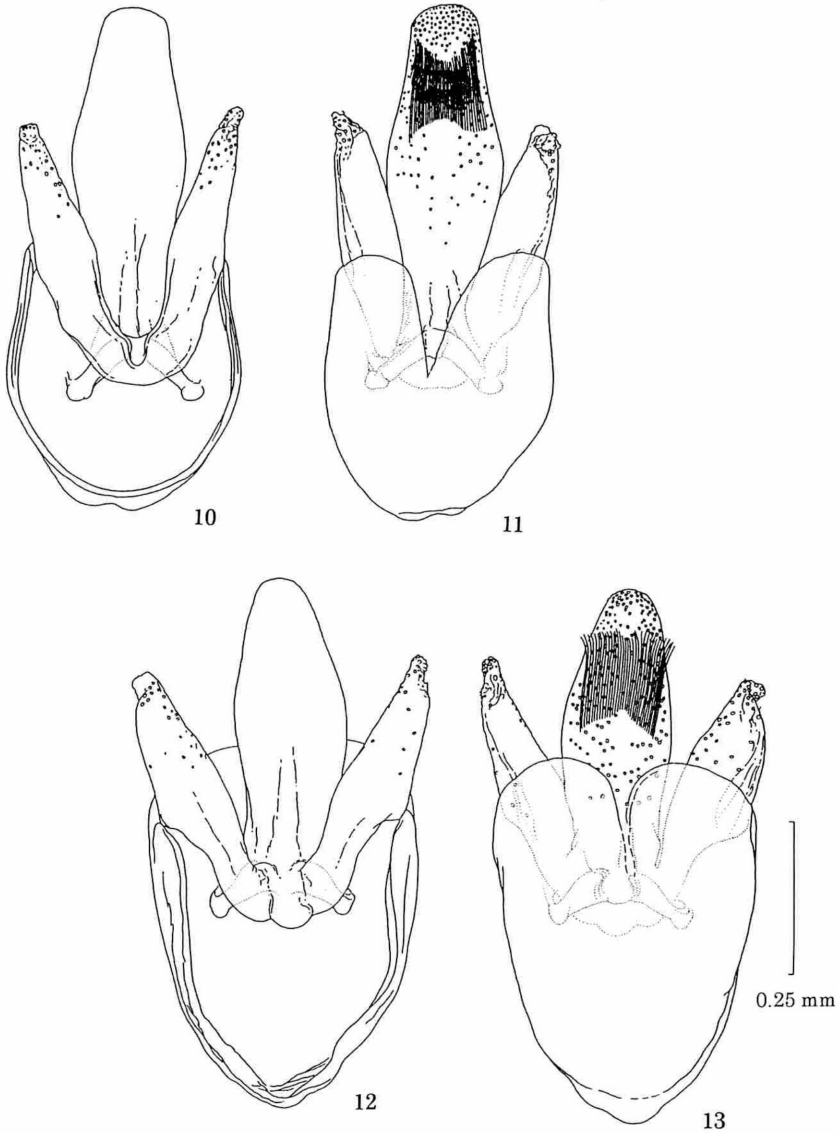
Female. It is unfortunate that detailed morphological characters cannot be described and illustrated in this paper, because the only available materials are not in a perfect condition. A photograph of living insect is given herewith (Fig. 15). It is very closely similar to that of *S. yoshimasai* sp. nov. in general appearance.

Type series. Holotype: ♂, Shimajiri-misaki Cape, Nakazato-son, Kume-jima Is., Okinawa Isls., 4~6–XII–1991, Y. GOTO leg. (YCM); Paratypes: 6 ♂♂, same data as for the holotype.

The holotype is deposited in the collection of the Yokosuka City Museum, Kanagawa. The paratypes are distributed to the collections of Mr. Y. GOTO and mine.

Type locality. Shimajiri-misaki Cape, Nakazato-son, Kume-jima Is., the Okinawa Isls. of the Ryukyu Archipelago.

Notes. This species is distinguished at first sight from the other congeners including *S. yoshimasai* sp. nov. by the peculiar body coloration. OHBA *et al.* (1996) al-



Figs. 10–13. Male genitalia of *Stenocladius* spp.; dorsal view (10, 12), ventral view (11, 13). — 10–11. *S. yoshimasai* KAWASHIMA, sp. nov., from Amami-Oshima Is. — 12–13. *S. flavipennis* KAWASHIMA, sp. nov. from Kume-jima Is.

ready described and illustrated the larval characters of this species, and also recorded a larva which has the same tergal colour-markings as this species from Tokashiki-jima Is. of the Kerama group. OHBA *et al.* (1997) observed mating behavior of this species, which is considered “LB system” communication (OHBA, 1983). It is confirmed by Mr.

Yoshimasa GOTO that the adult male has a pair of luminescence spots on venter of the 7th visible abdominal segment.

Stenocladius yoshikawai NAKANE

[Japanese name: Kiiri-kushihige-botaru]

(Figs. 16, 19–20)

Stenocladius yoshikawai NAKANE, 1981, *Fragm. coleopt.*, Kagoshima, (29/32): 125, fig. 1; type locality: Ohtomi, Iriomote Is., Yaeyama Isls.; 1983, *Hotaru no Kansatsu to Shiiku*, Tokyo, 91; 1997, *Nat. & Ins.*, Tokyo, **32**(8): 33–34, 36 (redescription and check list). — AZUMA & KINJÔ, 1987, *Check-list of the Insects of Okinawa*, 232. — OHBA, 1986, *Hotaru no Communication*, Tokyo, 153–154, 193, 227; 1997, *Nat. & Ins.*, Tokyo, **33**(7): 3 (check list, as *yosikawai* [sic]).

Stenocladius bicoloripes: SATÔ, 1985, *Coleopt. Japan Col.*, Osaka, **3**: 122, pl. 20. — AZUMA & KINJÔ, 1987, *Check-list of the Insects of Okinawa*, 232.

Notes. NAKANE (1981) commented that this species may be closely related to *S. bicoloripes* PIC from Taiwan, but the body is relatively small, the antennal appendages (=pectinae) are not so brownish and the tibiae and tarsi a little paler. On the other hand, SATÔ (1985) applied the name *S. bicoloripes* to this species. However, NAKANE (1997) revived the name *S. yoshikawai*, and also stated that several differences were recognized in the male genitalia between the two species.

The adult male is very similar in general appearance to that of *S. shirakii*, and the most yellowish individuals of the latter species cannot be distinguished from *S. yoshikawai*. It is therefore uncertain if this is a good species or a mere seasonal colour variation of *S. shirakii*. As is readily understood from Figs. 16 and 19–20, the male right antenna and the male genitalia are essentially the same between the two “species”. Further investigations on its exact systematic position, including examination of larval characters and so on, are required. SATÔ (1985) and AZUMA and KINJÔ (1987) added “Okinawa-hontô” to the range of distribution of this lampyrid, but confirmation is necessary.

Materials examined. 1 ♂, Urauchi, Iriomote-jima Is., Yaeyama Isls., 23–IV–1969, S. YAMAUCHI leg. (YCM); 1 ♂, Kanbirê (Kanpira)-no-taki Water Fall, Urauchigawa Riv., Iriomote-jima Is., Yaeyama Isls., 15–X–1995, M. KIMURA leg.

Range. Iriomote-jima Is. (Yaeyama Isls.)

Stenocladius shirakii NAKANE

[Japanese name: Kiberi-kushihige-botaru]

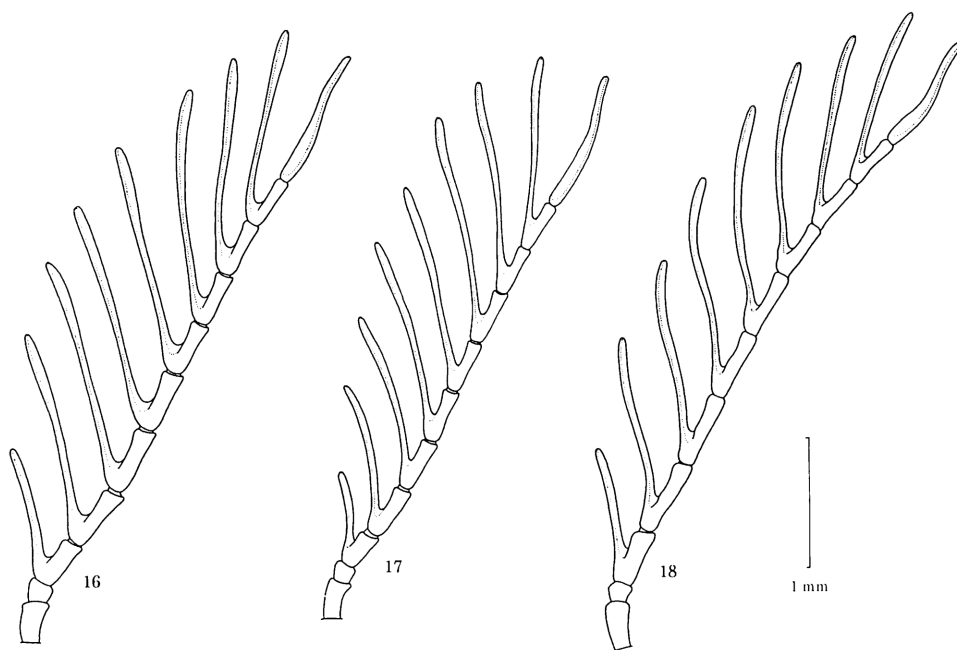
(Figs. 17, 21–22)

Stenocladius shirakii NAKANE, 1981, *Fragm. coleopt.*, Kagoshima, (29/32): 125–126, fig. 3; type locality: Funauki, Iriomote Is., Yaeyama Isls.; 1983, *Hotaru no Kansatsu to Shiiku*, Tokyo, 91; 1997, *Nat. & Ins.*, Tokyo, **32**(8): 34, 36 (redescription and check list). — AZUMA & KINJÔ, 1987, *Check-list of the Insects of Okinawa*, 232. — KAWASHIMA, 1998, *Nat. & Ins.*, Tokyo, **33**(7): 17 (morphology of adult female). — OHBA, 1986, *Hotaru no Communication*, Tokyo, 154, 156, 193, 227; 1998, *Nat. & Ins.*,



Figs. 14–15. Adult females of *Stenocladius* spp. — 14. *S. yoshimasai* KAWASHIMA, sp. nov., from Amami-Ohshima Is. — 15. *S. flavipennis* KAWASHIMA, sp. nov., from Kume-jima Is.

Tokyo, **33**(7): 3 (check list). — OHBA *et al.*, 1996, Sci. Rept. Yokosuka City Mus., (44): 21–22, 24–26, 28–30 (morphology and habit of larva); 1997, Sci. Rept. Yokosuka City Mus., (45): 23–25, 26–34, 36–37 (mating behavior and morphology of adult female). — SATÔ, 1985, Coleopt. Japan Col., Osaka, **3**: 122, pl. 20. — SUZUKI, 1997, Tokyo met. Univ. Bull. nat. Hist. (3): 11, 15–16, 19, 40, 49–53 (molecular phylogeny); 1998, Nat. & Ins., Tokyo, **33**(7): 12 (molecular phylogeny).

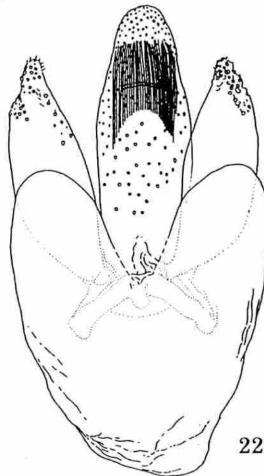
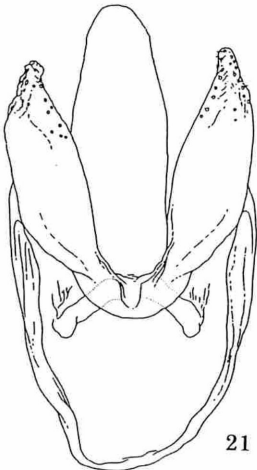
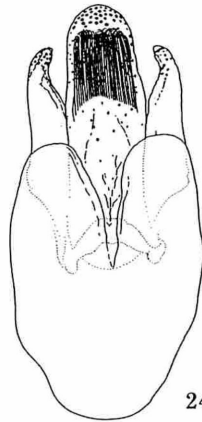
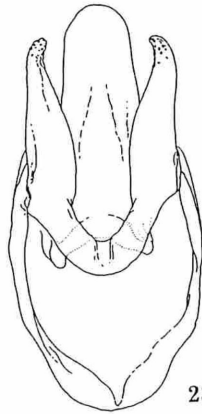
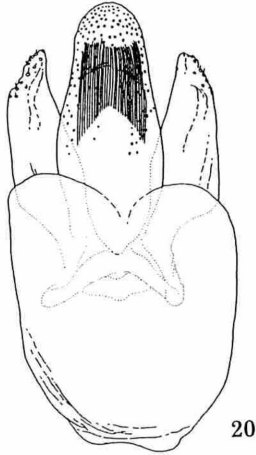
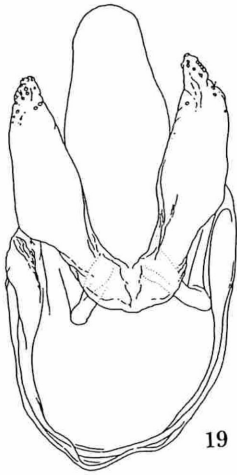


Figs. 16–18. Right male antennae of *Stenocladius* spp. — 16. *S. yoshikawai* NAKANE from Iriomote-jima Is. — 17. *S. shirakii* NAKANE from Iriomote-jima Is. — 18. *S. azumai* NAKANE from Okinawa-hontô Is.

Notes. The larva and adult female were described and illustrated by OHBA *et al.* (1996, 1997). As mentioned before, this species cannot be distinguished from *S. yoshikawai* in general morphology including male genitalia. The adult males in the populations of Ishigaki-jima and Iriomote-jima Islands are variable in elytral coloration, sometimes yielding intensified yellowish individuals. Up to the present, only the larva of this species has been known from Iriomote-jima Is. The adult males emerge in December to January, shifted from the appearance period of the preceding species. OHBA *et al.* (1997) observed the mating behavior of this species, which was considered “LB system” communication (OHBA, 1983).

Materials examined. [Ishigaki-jima Is.] 1 ♀, 22–XII–1993 (adult emerged), N. OHBA leg. and bred (YCM); 1 ♂, Yonehara, 23–I–1994, N. OHBA leg. (YCM); 1 ♂, same locality as above, 27–XII–1995, I. KAWASHIMA leg.; 7 ♂♂, ditto, 28–XII–1995, I. KAWASHIMA leg.; 9 ♂♂, ditto, 27–28–XII–1995, Y. GOTO leg.; 2 ♂♂, ditto, 29–XII–1997, Y. GOTO leg.; [Iriomote-jima Is.] 16 ♂♂, Funauki, 28–XII–1998, I. KAWASHIMA & Y. GOTO leg.; 6 ♂♂, same data and locality as above, Y. GOTO leg.; 28 ♂♂, Sonai, 12–

Figs. 19–24. Male genitalia of *Stenocladius* spp.; dorsal view (19, 21, 23), ventral view (20, 22, 24) — 19–20. *S. yoshikawai* NAKANE from Iriomote-jima Is. — 21–22. *S. shirakii* NAKANE from Iriomote-jima Is. — 23–24. *S. azumai* NAKANE from Okinawa-hontô Is.



XII-1993, N. OHBA leg. (YCM); 1 ♂, Funaura, 27-XII-1997, I. KAWASHIMA leg.; 11 ♂♂, Takana, 26-XII-1995, I. KAWASHIMA leg.; 11 ♂♂, same locality as above, 26~27-XII-1995, Y. GOTO leg.; 6 ♂♂, ditto, 26-XII-1996, Y. GOTO leg.; 13 ♂♂, ditto, 26-XII-1997, I. KAWASHIMA leg.; 1 ♂, ditto, 27-XII-1998, I. KAWASHIMA leg.; 1 ♂, Komi, XII-1995, native collector (YCM).

Range. Ishigaki-jima Is. and Iriomote-jima Is. (Yaeyama Isls.).

Stenocladius azumai NAKANE

[Japanese name: Tateobi-kushihige-botaru]

(Figs. 18, 23-24)

Stenocladius azumai NAKANE, 1981, *Fragm. coleopt.*, Kagoshima, (29/32): 126, fig. 2; type locality: Yona, Okinawa Is.; 1983, *Hotaru no Kansatsu to Shiiku*, Tokyo, 91-92; 1997, *Nat. & Ins.*, Tokyo, **32**(8): 34-36 (redescription and check list). — AZUMA & KINJÔ, 1987, *Check-list of the Insects of Okinawa*, 232. — KAWASHIMA, 1998, *Nat. & Ins.*, Tokyo, **33**(7): 17 (morphology of adult female). — OHBA, 1986, *Hotaru no Communication*, Tokyo, 154-156, 193, 227; 1998, *Nat. & Ins.*, Tokyo, **33**(7): 3 (check list). — OHBA *et al.*, 1996, *Sci. Rept. Yokosuka City Mus.*, (44): 21-22, 24-26, 28-30 (behavior and morphology of larva); 1997, *Sci. Rept. Yokosuka City Mus.*, (45): 23-24, 29-34, 36-37 (mating behavior and morphology of adult female). — SATÔ, 1985, *Coleopt. Japan Col.*, Osaka, **3**: 122, pl. 20.

Notes. The larva and adult female were described and illustrated by OHBA *et al.* (1996, 1997). The adult male is variable in body coloration, and the ground color of the elytra varies from grayish to dark brown. As mentioned before, SATÔ (1985) recorded *S. bicoloripes* (= *S. yoshikawai* in this paper) and AZUMA and KINJÔ (1987) recorded *S. yoshikawai* and *S. bicoloripes* from Okinawa-hontô Is. It is, however, likely that the records may have been in error on the most yellowish individuals or discolored specimens of this species. No other larvae of *Stenocladius* than that of *S. azumai* have hitherto been found on Okinawa-hontô Is. The male right antenna and the male genitalia are as shown in Fig. 18 and Figs. 23-24, respectively.

Materials examined. 2 ♂♂, Yona, Kunigami-son, Okinawa-hontô Is., 27-XI-1976, M. KINJÔ leg. (YCM); 1 ♂, same locality as above, 28-XI-1976, S. AZUMA leg. (YCM); 2 ♂♂, ditto, 2-XII-1995, S. TOYOGUCHI leg.; 1 ♂, Aha, Kunigami-son, Okinawa-hontô Is., 26-XII-1978, H. SUNAKAWA leg. (YCM); 1 ♀, Sueyoshi Park, Naha-shi, Okinawa-hontô Is., X-1988 (larva collected), I-1989 (adult emerged), N. OHBA leg. and bred (YCM).

Range. Okinawa-hontô Is. (Okinawa Isls.).

Key to the Species of the Genus *Stenocladius* from the Ryukyus for Male

- 1(2) Antennal pectinae 3-5 almost 4-6 times as long as their stems
 *S. yoshimasai* sp. nov. (Amami-Ohshima Is.).
- 2(1) Antennal pectinae 3-5 almost 2-3 times as long as their stems.

- 3(6) Elytra completely unicolored.
- 4(5) Elytra fresh yellow, of the same colour as pronotum.
 *S. yoshikawai* NAKANE (Iriomote-jima Is.).
- 5(4) Elytra yellowish brown, clearly different from pronotal coloration.
 *S. flavipennis* sp. nov. (Kume-jima Is.).
- 6(3) Elytra more or less bicolored.
- 7(8) Elytra mostly blackish, clearly margined with orange yellow throughout, but
 sometimes intensified yellowish; parameres not inwardly bent at the apices. . .
 *S. shirakii* NAKAKE (Ishigaki-jima & Iriomote-jima Is.).
- 8(7) Elytra grayish to dark brown, more or less paler in marginal areas though devoid
 of clear boundaries; parameres clearly bent inwards at the apices
 *S. azumai* NAKANE (Okinawa-hontô Is.).

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要 約

川島逸郎：南西諸島産クシヒゲボタル属および2新種の記載。——クシヒゲ（フサヒゲ）ボタル属は、日本においてはこれまでに琉球諸島から3種が知られている。本論文では、日本産の種における属の特徴を記し、既知種について若干の見解を述べるとともに、奄美諸島の奄美大島から発見された *Stenocladius yoshimasai* sp. nov.（アマミクシヒゲボタル — 和名新称）および、沖縄諸島の久米島から発見された *S. flavipennis* sp. nov.（シブイロクシヒゲボタル — 和名新称）を命名記載した。両種ともに外部形態は既知種に類似するが、前種の雄成虫は、とくに石垣・西表島産の *S. shirakii* NAKANE キベリクシヒゲボタルおよび沖縄本島産の *S. azumai* NAKANE タテオビクシヒゲボタルに色彩斑紋のパターンが類似するものの、大型で触角鞭節基部より櫛状に派生する枝状部の相対長がはるかに長いことで容易に区別される。雌成虫は本属としては非常に大型で、既知2種と同様にほぼ完全な幼虫形を呈し、*S. azumai*のものに類似している。*S. shirakii*とは概形、色彩斑紋、触角節数および尾肢の形状によって区別される。後種の雄成虫も大型で、他種とはまったく異なった体の色彩により一見して区別できる。本論文によって南西諸島からは5種が知られるにいたったが、このうち、西表島産の *S. yoshikawai* NAKANE キイロクシヒゲボタルについては、同所的に生息する *S. shirakii*および台湾産の *S. bicoloripes* PIC タイワンクシヒゲボタルとの関係、その分布域に関して、さらに多方面からの慎重な検討が望まれる。

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