

The Anophthalmic Trechine Beetles of the Genus *Kusumia* (Coleoptera, Trechinae)

Shun-Ichi UÉNO

Department of Zoology, National Science Museum (Nat. Hist.),
3–23–1 Hyakunin-chô, Shinjuku, Tokyo, 169–0073 Japan

Abstract The anophthalmic beetles of the trechine genus *Kusumia* are delineated. The specimens hitherto known from twenty-four localities, all lying in the southern half of the Kii Peninsula, Central Japan, are classified into eleven species and two subspecies, nine of which are described as being new to science. They are: *K. elongata* (fodinicolous), *K. dentata* (fodinicolous), *K. laticollis* (upper hypogean), *K. tanakai* (upper hypogean and fodinicolous), *K. latior* (upper hypogean), *K. australis* (upper hypogean), *K. yoshikawai latipennis* (upper hypogean), *K. amicornum* (upper hypogean), and *K. longicollis* (upper hypogean). A key is given to all the known species and subspecies.

The genus *Kusumia* was originally erected for an anophthalmic trechine beetle discovered in a limestone cave lying at the central part of the Kii Peninsula, Central Japan. Its original account, given in a key, was not satisfactory since it was based on a single female, and the subgenus was regarded by JEANNEL (1953, pp. 128, 129) as a junior synonym of *Ryugadous*. At that time, however, I already obtained males of the type species, became fully aware of its generic peculiarity, and tentatively gave a generic status to *Kusumia* (UÉNO, 1953, p. 45, 1955, p. 44). A full account of the genus was given in 1960 with descriptions of two new species and one new subspecies, which explained beyond doubt the independent taxonomic status of *Kusumia*. This was well accepted by JEANNEL (1962, pp. 202, 204) and CASALE and LANEYRIE (1982, pp. 19, 91), and the genus has since been regarded as a relative of *Ryugadous* isolated to the southern half of the Kii Peninsula south of the Ki-no-kawa depression.

Since the end of the 1970's, new materials of *Kusumia* have been accumulated, and particularly in the first half of the 1980's, several distinctive new species were discovered. However, most members of this trechine genus were so rare that it was difficult to obtain adequate material to introduce them into science. Even at the present moment, some populations of *Kusumia* are known from only females or even from a single female. On the other hand, about a half of the localities of those new species became destroyed in the past decade or so, either by construction of new roads or by destruction of mine adits (cf. TANAKA, 1993, pp. 13–14). Under such circumstances, it seems better to describe and name now the new forms whose systematic statuses have already been determined.

Of the twenty-four localities hitherto known, seven are limestone caves distributed in the Ki-no-kawa (Yoshino-gawa) and the Kumano-gawa (Totsu-gawa) drainages at the northeastern part of the generic range, three are mine adits lying in the southern and southwestern parts of the peninsula, and the remaining fourteen are upper hypogean habitats lying on low hills 150 m or so above sea-level to fairly high mountains more than 1,500 m in height. It cannot be said that our investigations are satisfactory as regards the upper hypogean zone, but the steep topography of the area concerned has made it difficult to locate adequate taluses or colluvia.

The specimens obtained from the twenty-four populations are classified into eleven species and two subspecies, of which all but one (*K. longicollis*) are known from the two sexes. Nine of the eleven species and two subspecies are new to science, and are described with illustrations. The abbreviations used in the present paper are the same as those explained in previous papers of mine.

Because of the difficulty in collecting the rare trechine beetles, I have received invaluable aid in the field investigations from many colleagues and friends of mine. First of all, I have to thank Dr. Yoshiaki NISHIKAWA and Mr. Shotaro TANAKA, without whose unfailing support, I could never have completed the present study. Deep gratitude should be expressed to the following friends of mine for their kindly help extended to me in searching for *Kusumia*: Dr. Hiroshi MINATO, Dr. Shusaku MINATO, Dr. Akiko SAITO, Messrs. Hisashi ASHIDA, Kunihiko KAMADA, Akira KITAYAMA, Takeshi KITAYAMA, Satoshi NAKAMURA, Akira NOTO and Takumi SAITO.

Genus *Kusumia* S. UÉNO, 1952

Ryugadous subgen. *Kusumia* S. UÉNO, 1952, Mushi, Fukuoka, **24**, p. 16; type species: *Ryugadous takahashii* S. UÉNO, 1952. — JEANNEL, 1953, Notes biospéol., Paris, **8**, pp. 128, 129.

Kusumia: S. UÉNO, 1955, Mem. Coll. Sci. Univ. Kyoto, (B), **22**, p. 44; 1960, Mem. Coll. Sci. Univ. Kyoto, (B), **27**, p. 122. — JEANNEL, 1962, Revue fr. Ent., **29**, pp. 202, 204. — CASALE & LANEYRIE, 1982, Mém. Biospéol., Moulis, **9**, pp. 19, 91.

Though fully described in my 1960 paper (pp. 122–123), the genus *Kusumia* was then known from only three species and one subspecies representing two species-groups of close relationship. It was considered to differ from *Ryugadous* by the presence of two or three setiferous dorsal pores of the external series on the elytra and the absence of differentiated inner armature in the aedeagal tube. Both JEANNEL (1962, *loc. cit.*) and CASALE and LANEYRIE (1982, *loc. cit.*) adopted these features for characterizing the genus. Since then, however, the genus has been enlarged by the discovery of nine new forms, and the new findings have clearly demonstrated that *Kusumia* is much more diverse than it was considered before. It is particularly important that the species distributed in the southern and southwestern areas of the Kii Peninsula are markedly different in aedeagal conformation from those occurring in the northeastern area, in which lie all the localities of the previously described forms. Indeed, the difference is so remarkable that the former could be considered generically different from the latter,

were it not for a close similarity in external morphology and for the occurrence of aberrant individuals that bridge the gap in external differences between the two groups.

In the present paper, five species-groups will be recognized for the members of *Kusumia*. With the exception of one whose aedeagal characters are unknown, they are roughly divided into two major groups mentioned above by the presence or absence of differentiated inner armature. Each of them may be subdivided into two groups isolated geographically. Before going to deal with the subject, however, I have to revise the diagnostic characters of the genus as follows:

Medium- to large-sized trechines belonging to the *Trechiana* series. Facies anophthalmoid with fairly long appendages. Apterous and depigmented; surface covered with pubescence except for a small apical portions of elytra in some species; colour reddish brown. Head with entire frontal furrows, pubescent genae, and two pair of supraorbital pores; mentum free, with the tooth usually simple though sometimes bifid, submentum sexsetose; palpi slender. Prothorax cordate or elongated cordate and convex, with entirely bordered sides bearing two pair of marginal setae and a few fringing hairs; front angles porrect, hind angles always sharp; lateral expansion of propleura more or less visible from above. Elytra ovate to oblong-ovate and convex, depressed or shallowly foveate in basal part, and with a transverse furrow on basal peduncle; shoulders either tuberculate or nearly effaced; prehumeral borders oblique and complete to the base of stria 5, either ciliated throughout or glabrous except for a pair of hairs lying at the external edges of basal transverse furrow; striae superficial though nearly entire and indistinctly crenulate, scutellar striole short, apical striole sharply impressed, usually joining or directed to stria 5 but rarely joining stria 7; stria 3 either with one setiferous dorsal pore near base or devoid of it; stria 5 with two or three setiferous dorsal pores; preapical pore located at the apical anastomosis of striae 2 and 3 more or less behind the level of the terminus of apical striole; marginal umbilicate pores not aggregated, the proximal three being ranged almost equidistantly and adjoining marginal gutter but the fourth pore is widely distant from the other three and does not adjoin marginal gutter.

Ventral surface pubescent; anal sternite usually with two pair of marginal setae in ♂, with three pair of them in ♀. Legs fairly long and slender; protibiae entirely pubescent and not externally grooved; in ♂, protarsomeres 1 and 2 widely dilated, stoutly produced inwards at the apices, and furnished beneath with adhesive appendages.

Male genitalia either small or fairly large and moderately sclerotized. Aedeagus unusually variable in configuration, particularly so in the shape and structure of apical lobe; basal part more or less elongate, usually with a distinct sagittal aileron but sometimes devoid of it. Inner sac either inerm or provided with differentiated inner armature; if present, copulatory piece anisotropic, either small and reniform or lengthened anteriorly to form a "tail"; a secondary copulatory piece sometimes present at the left dorsal side of ordinary one; sclerotized teeth sometimes covering large part of inner sac. Styles either slender or broad, sometimes obliquely truncated at the dorsal side of terminal parts, each usually provided with four apical setae, though the number and

thickness of parameral setae are variable to some extent according to species or individuals.

Thus redefined, certain diagnostic chaetotaxial character of *Kusumia* overlaps that of the subgenus *Yuadorgus* of the genus *Ryugadous*. These two are, however, decisively different in evolutionary trend of the male genitalia. In *Yuadorgus*, the aedeagus lacks wide diversity, always bearing a large spatulate copulatory piece and lacking in sclerotized teeth-patches (cf. UENO, 1965, p. 14, 1975, 1979). In *Kusumia*, on the other hand, the aedeagal tube itself is much diversified and sometimes accomplishes drastic modification, the teeth-patches are absent in the northeastern species but often attain their utmost development in the others, the copulatory piece is absent in the northeastern species, small and reniform in the southwestern ones, and peculiarly lengthened anteriorly in the southern ones, and even a secondary copulatory piece with obvious component teeth is formed in the southwestern species. From the subgenus *Ryugadous* (s. str.), it is evidently different in the elytral chaetotaxy and conformation of the male genitalia. *Kusumia* is therefore generically different from *Ryugadous* inclusive of *Yuadorgus*, and can be discriminated from the latter by the following key:

- 1 (2) Smaller species restricted to the Island of Shikoku; elytral stria 3 always with one setiferous dorsal pore near base; elytral stria 5 either with one setiferous dorsal pore behind middle (*Ryugadous* s. str.) or two setiferous dorsal pores (*Yuadorgus*). *Ryugadous* HABU.
- 2 (1) Larger species restricted to the southern half of the Kii Peninsula; elytral stria 3 either with one setiferous dorsal pore near base or devoid of dorsal pore; elytral stria 5 with two or three setiferous dorsal pores; if identical with *Yuadorgus* in the elytral chaetotaxy at one side (one pore on stria 3 and two pores on stria 5), aedeagus either devoid of copulatory piece (*K. yoshikawai yoshikawai*) or with intricately differentiated inner armature (*K. australis*) *Kusumia* S. UENO.

Range. Widely distributed in the southern half of the Kii Peninsula, Central Japan, south of the Ki-no-kawa depression. Known so far from the Daikô Mountains, Ohminé Mountains, Obako Mountains, Ohtô Mountains, and the coastal hills at the southern and southwestern parts of the peninsula. It has been known neither from the Hatenashi Mountains traversing the meeting point of the Obakos and the Ohtôs nor from the Shirama Mountains extending westwards from the Obakos, but certain unknown species should occur there, above all on the Hatenashis stretching from east to west in the centre of the distributional range of the genus.

Species-groups. The specimens of *Kusumia* hitherto accumulated are classified into eleven distinctive species. Four of them occurring on the Daikô and the Ohminé Mountains are different from the remainings in the bare apical portions and the nearly glabrous prehumeral borders of the elytra, and the inerm aedeagus. Mainly because of the presence or absence of the setiferous dorsal pore of the internal series, they are di-

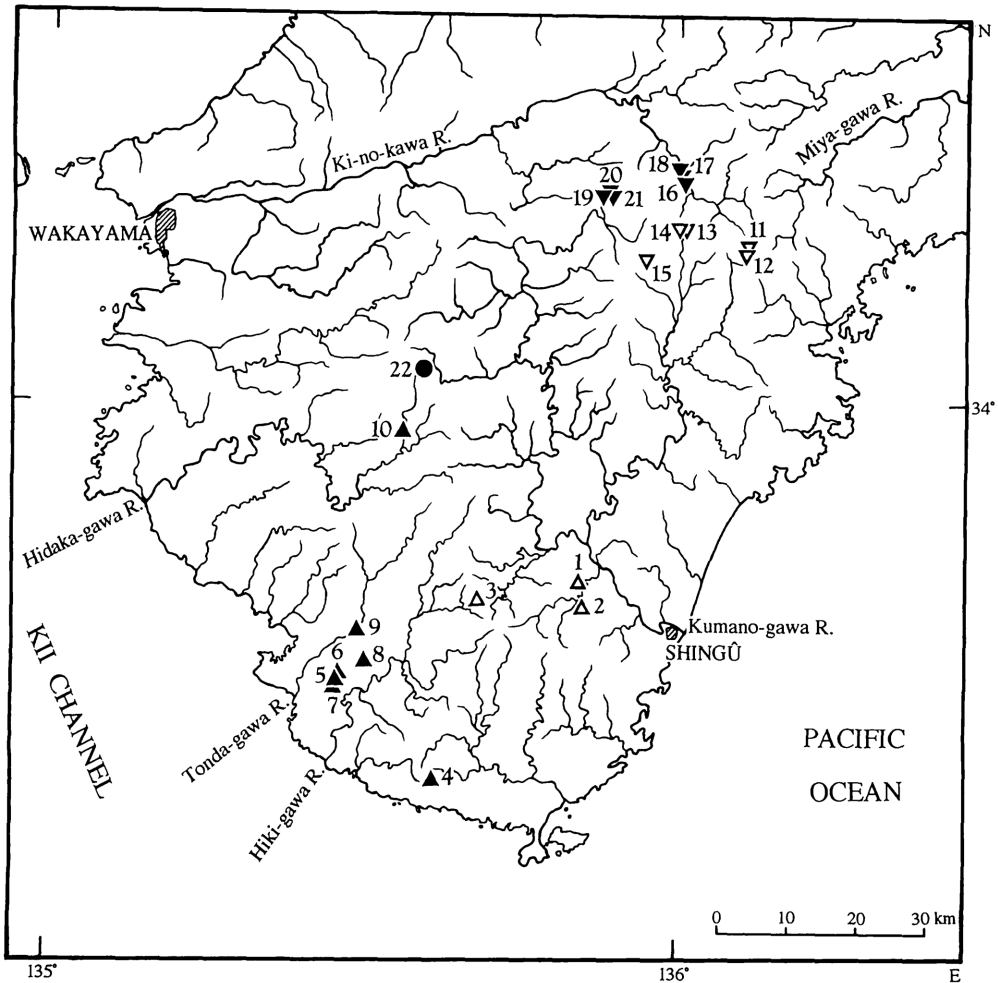


Fig. 1. Map showing the distribution of anophthalmic trechine beetles of the genus *Kusumia*. Open triangles: Group of *K. elongata*. Black triangles: Group of *K. tanakai*. Open obtriangles: Group of *K. yoshikawai*. Black obtriangles: Group of *K. takahasii*. Black circle: Group of *K. longicollis*. — 1, *K. elongata* (Shimokodani-kô Adit of the Kishû Mines); 2, *K. dentata* (Shimonosako-kô Adit of the Rokkandani Mines); 3, *K. laticollis* (Kurozô-dani on Mt. Nodakehoshi); 4, *K. australis* (Kokashi-tôgê); 5, *K. tanakai* (Nan-daki and Taki-dani in the Gôji-dani Valley); 6, *K. tanakai* (Gôji-dani); 7, *K. tanakai* (Kodani-tôgê at Hisagi); 8, *K. tanakai* (Sotoba-tôgê at Kawaradani); 9, *K. tanakai* (prospecting adit at Shimodaira); 10, *K. latior* (Hirano-dani in Ryûjin-mura); 11, *K. yoshikawai yoshikawai* (Sanzukôchi-yama on Mt. Ohdaigahara-zan); 12, *K. yoshikawai yoshikawai* (Nagoya-dani on Mt. Ohdaigahara-zan); 13, *K. yoshikawai latipennis* (Obaminé-tôgê); 14, *K. yoshikawai latipennis* (Wasamata-guchî); 15, *K. amicum* (below Ichinotawa on Mt. Misen); 16, *K. takahasii takahasii* (Fudô-no-iwaya Cave at Kashiwagi); 17, *K. takahasii takahasii* (Suishô-no-iwaya Cave at Kitawada); 18, *K. yosiana* (Tennin-no-iwaya Cave at Shirakawado); 19, *K. takahasii tsudai* (Menfudô-no-iwaya Cave at Dorogawa); 20, *K. takahasii tsudai* (Shinsen-dô Cave and Kômorino-iwaya Cave at Dorogawa); 21, *K. takahasii tsudai* (Goyomatsu-daini-dô Cave at Dorogawa); 22, *K. longicollis* (Okusenjô on the Obako Mts.).

vided into two species-groups to be called the *takahasii* and the *yoshikawai* groups. They are directly related to each other, and the gap is bridged by rare occurrence of chaetotaxially aberrant individuals.

Of the remaining seven, six species occurring in the southern and the southwestern parts of the peninsula are directly related to one another, but can be divided into two species-groups to be called the *elongata* (southern) and the *tanakai* (southwestern) groups mainly by the differences in the conformation of copulatory piece and teeth-patches. However, these differences may be indefinite, as is suggested by the genitalic similarity of a species of the former group to a species of the latter. Sclerotization and fusion of the teeth covering the aedeagal inner sac may be gradual in contrast to considerable diversification of the aedeagal tube.

Unfortunately, no *Kusumia* has been collected from the southern part of the Ohminé Mountains and the eastern part of the Hatenashi Mountains, which lie between the distributional ranges of the *takahasii*–*yoshikawai* groups and the *elongata*–*tanakai* groups. If certain species could be found on those mountains, they might prove useful for filling in the blank in our knowledge about relationships of the species-groups, above all between the northern and the southern ones. The same can be said for the isolated species occurring on the Obako Mountains hitherto known from only one female. This species, tentatively discriminated in the monotypical *longicollis* group, may be a link between the northeastern and the southwestern groups.

Key to the Species and Subspecies

- 1 (24) Prothorax about as long as wide and contracted at base; if elongate and relatively wide at base (*K. amicorum* and *K. yosiiana*), elytra glabrous at least in the field of apical striole, with only the anteriormost hair on each prehumeral border and with three setiferous dorsal pores on stria 5.
- 2 (19) Elytral stria 3 without setiferous dorsal pore; if the pore of the internal series present on one elytron (*K. australis* and *K. yoshikawai yoshikawai*), the seta is obviously weaker than those of the external series and the pronotum is about as long as wide.
- 3 (16) Elytral stria 5 with two setiferous dorsal pores; if a third dorsal pore present on one elytron (*K. yoshikawai yoshikawai*), pronotum about as long as wide, elytra glabrous in the field of apical striole and with only the anteriormost hair on each prehumeral border, and aedeagus inerm.
- 4 (15) Elytra wholly pubescent to apices, with prehumeral borders ciliated throughout; aedeagus with differentiated inner armature.
- 5 (10) Relatively large species with less prominent elytral shoulders; male genitalia small, variously modified at the apex; inner sac devoid of teeth-mat and apical plate; copulatory piece much more elongate, lengthened proximally; secondary copulatory piece not formed.
- 6 (9) Prothorax narrower and more elongate, usually longer than wide; aedeagus

- less voluminous, with the ventral edge distinctly lamellate in apical third; teeth-patches in aedeagal inner sac less extensive; styles with shorter apical setae.
- 7 (8) Aedeagal apical lobe narrower in profile, with the terminal part abruptly curved ventrad and dilated into a fan-shaped apex; teeth-patches not connected; length 4.80–5.75 mm; [Shimokodani-kô Adit of the Kishû Mines] *K. elongata* sp. nov.
- 8 (7) Aedeagal apical lobe broader and slightly reflexed in profile, longitudinally hollowed on the ventral side and fringed with a longitudinal row of five or six stout teeth on each side of the hollow; teeth-patches apically connected by an irregular row of sclerotized teeth; length 5.00–5.90 mm; [Shimonosako-kô Adit of the Rokkandani Mines] *K. dentata* sp. nov.
- 9 (6) Prothorax wider, either as wide as or slightly wider than long; aedeagus voluminous, high at the middle, with the ventral edge only very narrowly lamellate at the base of apical lobe; teeth-patches in aedeagal inner sac more extensive; styles with slenderer apical setae; length 4.85–5.50 mm; [Mt. Nodakehoshi of the Ohtô Mts.] *K. laticollis* sp. nov.
- 10 (5) Relatively small species with prominent, sometimes subtuberculate, elytral shoulders; male genitalia either large with narrowly protrudent apical lobe or small with short apical lobe; inner sac covered with teeth-mat from the right to the ventral sides and provided at apical orifice with an apical plate formed by fusion of sclerotized teeth; copulatory piece small, reniform; secondary copulatory piece present.
- 11 (14) Elytra with less prominent humeral angles; aedeagus larger and more elongate, with narrowly protrudent apical lobe; sagittal aileron present though narrow and hyaline.
- 12 (13) Pronotum usually narrower, more contracted at base; elytra narrower and more elongate; aedeagal apical lobe deflexed and longitudinally dilated at the tip to form an oblique platelet; styles obliquely truncated at the dorsal side of the terminal parts; length 4.50–5.10 mm; [coastal hills lying between the Tonda-gawa and the Hiki-gawa Rivers] *K. tanakai* sp. nov.
- 13 (12) Pronotum usually wider, less contracted at base; elytra wider and less elongate; aedeagal apical lobe reflexed and blunt at the extremity; styles not obliquely truncated at the terminal parts; length 4.70–5.15 mm; [Hiranodani] *K. latior* sp. nov.
- 14 (11) Elytra with more prominent humeral angles; aedeagus smaller, shorter and higher, with short apical lobe tuberculate at the tip; sagittal aileron absent; length 4.60–5.25 mm; [Kokashi-tôgê] *K. australis* sp. nov.
- 15 (4) Elytra glabrous in the field of apical striole and with only the anteriormost hair on each prehumeral border; aedeagus devoid of differentiated inner armature; length: 4.55–5.35 mm; [Ohdaigahara Mts.] *K. yoshikawai yoshikawai* S. UENO.

- 16 (3) Elytral stria 5 with three setiferous dorsal pores; if one of the three is lacking on one elytron (*K. yoshikawai latipennis*), elytra glabrous in the field of apical striole and with only the anteriormost hair on each humeral border.
- 17 (18) Smaller; elytra shorter, with subtuberculate humeral angles; length: 4.80–5.50 mm; [vicinities of Mt. Oba-ga-miné]. *K. yoshikawai latipennis* subsp. nov.
- 18 (17) Larger; elytra more elongate, with shoulders less salient and not tuberculate; length: 5.55–5.80 mm; [Mt. Misen]. *K. amicorum* sp. nov.
- 19 (2) Elytral stria 3 with a setiferous dorsal pore near base; elytra glabrous in the field of apical striole, with only the anteriormost hair on each prehumeral border and usually with three setiferous dorsal pores on stria 5; aedeagus inerm.
- 20 (23) Elytra smaller, less than twice as wide as pronotum, with shoulders nearly effaced and not forming humeral tubercles; aedeagus slenderer in basal half, with the apical part not ventrally curved; sagittal aileron present; smaller species; [*K. takahashii* (S. UÉNO)].
- 21 (22) Prehumeral borders less oblique; aedeagus regularly arcuate and gradually attenuate towards apex from behind middle, with apical lobe narrower in profile; length: 4.90–5.50 mm; [limestone caves in Kawakami-mura] *K. takahashii takahashii* (S. UÉNO).
- 22 (21) Prehumeral borders more oblique; aedeagus not regularly arcuate but abruptly bent at middle, and rapidly attenuate towards apex from the level of apical orifice, with apical lobe short and large-angled in profile; length: 4.60–5.50 mm; [limestone caves at Dorogawa]. *K. takahashii tsudai* S. UÉNO.
- 23 (20) Elytra larger, much more than twice as wide as pronotum, with shoulders prominent and tuberculate; aedeagus thicker in basal half, with the apical part narrow in profile and ventrally curved; no sagittal aileron; length: 5.70 mm; [Tennin-no-iwaya Cave]. *K. yosiiiana* S. UÉNO.
- 24 (1) Prothorax much longer than wide and relatively wide at base; elytra distinctly tuberculate at shoulders, wholly pubescent to apices and with only the anteriormost hair on each prehumeral border; two setiferous dorsal pores on stria 5 and none on stria 3; length: 4.75 mm; [Okusenjô on the Obako Mts.] *K. longicollis* sp. nov.

***Kusumia elongata* S. UÉNO, sp. nov.**

(Figs. 2–5)

Kusumia sp. C: TANAKA, 1993, Kuroshio, Gobô, (12), p. 13.

Length: 4.80–5.75 mm (from apical margin of clypeus to apices of elytra).

Not directly related to any species previously described. Rather variable in size though usually large for a member of *Kusumia*. Body elongate, with small head, nar-

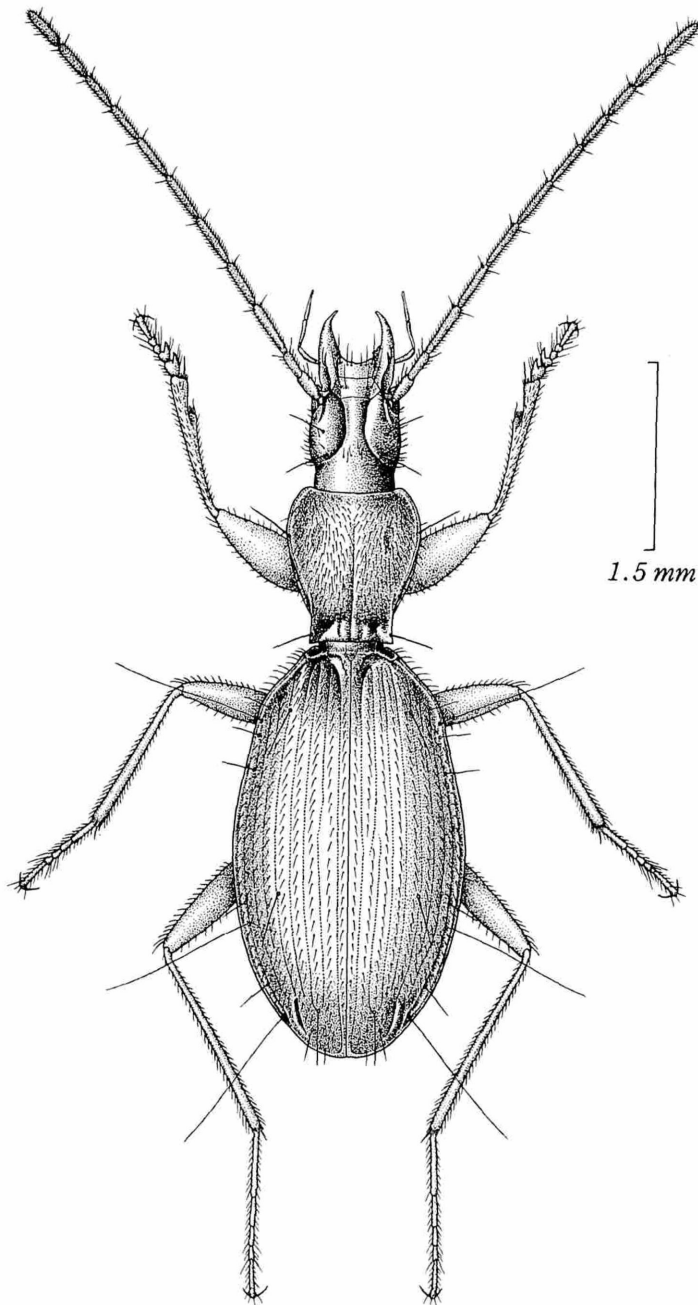


Fig. 2. *Kusumia elongata* S. UÉNO, sp. nov., ♂, from Shimokodani-kô Adit of the Kishû Mines.

row prothorax, elongate elytra, and long appendages; surface pubescent on both dorsum and venter, though almost glabrous on clypeus, frons and anterior parts of supra-orbital areas; apterous and depigmented. Colour reddish brown, shiny, very faintly iridescent on elytra; palpi and apical halves of antennae paler; legs sometimes lighter in colour than body, particularly on the ventral side.

Head subquadrate, about as long as wide, widest at a level between supraorbital pores, and much more gradually narrowed anteriorly than posteriorly; dorsum depressed, with deep frontal furrows not angulate at middle, gently arcuate in front and widely divergent behind; frons and supraorbital areas gently convex, supraorbital pores lying on lines slightly convergent posteriorly; microsculpture sharply impressed, mostly consisting of minute wide meshes; genae feebly convex, more distinctly at the posterior parts; neck wide, with the anterior constriction distinctly marked and fairly deep at the sides; labrum transverse, widely emarginate at the apex; mandibles slender, moderately arcuate at the apical parts and acute; mentum tooth simple; palpi slender; antennae long and slender, usually reaching apical two-fifths of elytra in ♂, usually a little shorter than that in ♀, segment 2 the shortest, about four-ninths as long as segment 3 or 4, segments 5–10 gradually decreasing in length towards apex, each cylindrical, segment 6 about 4.5 times as long as wide, terminal segment about as long as segment 6, obviously longer but narrower than scape.

Pronotum cordate, much wider than head, more or less longer than wide, widest at about three-fourths from base, and more contracted at base than at apex in most specimens; PW/HW 1.44–1.57 (M 1.49), PW/PL 0.92–0.99 (M 0.96), PW/PA 1.42–1.56 (M 1.49), PW/PB 1.51–1.68 (M 1.58); sides narrowly bordered throughout, gently arcuate in front, almost straightly convergent posteriorly, shallowly though distinctly sinuate at a level between basal sixth and fifth, and then either subparallel or slightly divergent towards hind angles; anterior pair of marginal setae usually inserted a little behind the widest part, the posterior removed forwards from hind angles; apex slightly emarginate, more or less wider than base, PB/PA 0.90–0.99 (M 0.94) [PA/PB 1.01–1.11 (M 1.06)], with front angles produced forwards though rounded at the tips; base nearly straight at middle, posteriorly oblique on each side inside sharp hind angle; dorsum gently convex and rather densely covered with fairly long, suberect hairs, usually with a shallow longitudinal depression on each side at the level of the widest part; microsculpture mostly distinct, largely consisting of fine transverse lines; median line sharply impressed, becoming wider and deeper in basal area; apical transverse impression vague and uneven; basal transverse impression fairly deep though mal-defined, provided with a deep longitudinal foveole on each side of median line and laterally merging into basal foveae, which are not large but deep; postangular carinae usually distinct, sometimes very obtuse; basal area narrow and more or less uneven. Lateral expansion of propleura slightly visible from above.

Elytra elongated subovate, obviously wider than prothorax and more than a half longer than fore body, widest at about middle, and almost equally narrowed towards bases and towards apices, though the basal parts are broader than the apical due to dis-

tinct humeral angles; EW/PW 1.71–1.85 (M 1.76), EL/PL 2.64–2.85 (M 2.73), EL/EW 1.56–1.66 (M 1.62); shoulders distinct though rounded and not tuberculate, with pre-humeral borders complete, oblique, nearly straight, and provided with a fringe of five to eight hairs; sides narrowly bordered throughout, either straight or very slightly emarginate for a short way behind humeral angles, moderately arcuate at middle, and conjointly rounded at apices, each with a very slight preapical emargination; dorsum moderately convex though longitudinally depressed on the disc, and with a round depression in the basal area which is delimited on each side by a very obtuse basal carina formed by the basal portion of interval 5; apical declivity steep; microsculpture formed by fine transverse lines which are perceptible throughout; striae shallow particularly at the side though entire, indistinctly crenulate, 1–3 more or less deepened in basal depression, 5 curved inwards at the basal portion along the external side of basal carina and extending to the base of prehumeral border, 8 deepened behind the middle set of marginal umbilicate pores; scutellar striole short but distinct; apical striole short, moderately curved, and usually joining stria 5; intervals flat, each bearing an irregular row of rather long suberect hairs, which extends onto the field of apical striole; apical carina very obtuse; stria 3 devoid of setiferous dorsal pore; preapical pore located on or behind the level of the terminus of apical striole and more distant from apex than from suture; stria 5 always with two setiferous dorsal pores at $1/7$ – $1/5$ (usually about $1/6$) and $1/2$ – $3/5$ (usually about $3/5$) from base, respectively; marginal umbilicate pores as described under the genus.

Ventral surface smooth though pubescent. Legs long and slender; protibiae straight and gradually dilated towards apices; tarsi thin, tarsomere 1 shorter than tarsomeres 2–4 together in mesotarsus, about as long as that in metatarsus; in ♂, two proximal protarsomeres widely dilated and remarkably produced inwards at apices.

Male genital organ relatively small though moderately sclerotized. Aedeagus only one-third as long as elytra, fairly short and robust, strongly arcuate, and gradually tapered towards apex, with the dorsal margin semicircularly rounded in profile; basal part elongate, strongly curved ventrad, deeply emarginate at the sides of basal orifice, and provided with a moderately developed sagittal aileron; apical lobe fairly long, with the left ventral edge narrowly lamellate; viewed dorsally, apical lobe elongate, slightly asymmetrical, gradually tapered towards apex, which is distinctly tuberculate at the extremity; viewed laterally, apical lobe straightly produced ventro-apicad, abruptly curved ventrad at the terminal portion and dilated into a fan-shaped apex; ventral margin widely emarginate behind middle in profile. Inner sac armed with a copulatory piece and two patches of sclerotized teeth; copulatory piece more than one-third as long as aedeagus, obliquely lying at the right side of the middle, very slender in proximal two-fifths, enlarged apically and crooked before the rounded apex; right dorsal teeth-patch composed of compactly arranged large teeth forming an elongated oviform though the teeth are not fused together; left ventral teeth-patch smaller than the right dorsal, consisting of rather lamellar curved teeth. Styles fairly large though with narrow apical parts more or less obliquely truncated at the tips, left style obviously longer

than the right, each usually bearing four rather short setae at the apex; a smaller extra seta sometimes present on one style.

Type series. Holotype: ♂, allotype: ♀, 17-XI-1978, S. UENO leg. Paratypes: 8 ♂♂, 13 ♀♀ (incl. teneral 1 ♂, 1 ♀), 17-XI-1978, S. UENO leg.; 7 ♂♂, 5 ♀♀, 16-III-1980, S. UENO & Y. NISHIKAWA leg.; 9 ♂♂, 8 ♀♀ (incl. teneral 1 ♂, 3 ♀♀), 27-III-1981, S. TANAKA leg.; 10 ♂♂, 10 ♀♀ (incl. teneral 6 ♀♀), 18-X-1981, S. TANAKA leg.; 19 ♂♂, 10 ♀♀ (incl. teneral 4 ♂♂, 3 ♀♀), 23-V-1982, S. UENO & Y. NISHIKAWA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Shimokodani-kô Adit of the Kishû Mines, at Taniguchi of Kumagawa-chô in Wakayama Prefecture, Central Japan.

Notes. As is readily understood from the peculiar conformation of its male genitalia, this remarkable new species forms a particular species-group within the genus together with two other species (*K. dentata* and *K. laticollis*) to be described on the following pages. This new species-group, to be called the *elongata* group, is characterized by a combination of the following features: large species of elongate facies; prothorax cordate, either longer than wide or about as long as wide, with base usually a little narrower than apex; elytra elongate, wholly pubescent, with shoulders distinct but hardly tuberculate and with prehumeral borders ciliated throughout; elytral stria 3 devoid of setiferous dorsal pores; elytral stria 5 always with two setiferous dorsal pores; aedeagus relatively small though robust, inner sac covered with poorly sclerotized scales not forming thick teeth-mat, and provided with a slender copulatory piece enlarged and crooked in apical half and two or more sclerotized teeth-patches sometimes connected sigmoidally.

Among the members of *Kusumia*, this new species was exceptional in high population density at its type locality, which is an abandoned adit of a copper mine lying in an evergreen broadleaved forest on the right side of the Taniguchi-dani Valley at an elevation of only 70 m. The adit was narrow but fairly long and had branch galleries. The trechine beetle was found from under stones and rotten logs or running on soft mud deposited along a narrow gutter. Unfortunately, the adit was crushed by construction of a forestry road, and is not accessible at present. Since the beetle should survive in the upper hypogean zone, attempts have been made to find out other habitats of the species, but have not been repaid so far.

It seems worth noting that most specimens of the type series of this new species were smeared with tar-like substance on their buccal appendages and front tarsi and tibiae, often on the tarsi of all the legs. Though apparently not being a nuisance to living insects, this dark substance, probably seeped from tarred mine posts, sticks to specimens as a thin film when dried, and cannot be easily removed in the process of mounting them. I have never seen such smeared specimens of trechines, though mine posts are usually tarred in other adits inhabited by anophthalmic beetles.

Kusumia dentata S. UÉNO, sp. nov.

(Figs. 6–8)

Kusumia sp. B: TANAKA, 1993, Kuroshio, Gobô, (12), p. 13.

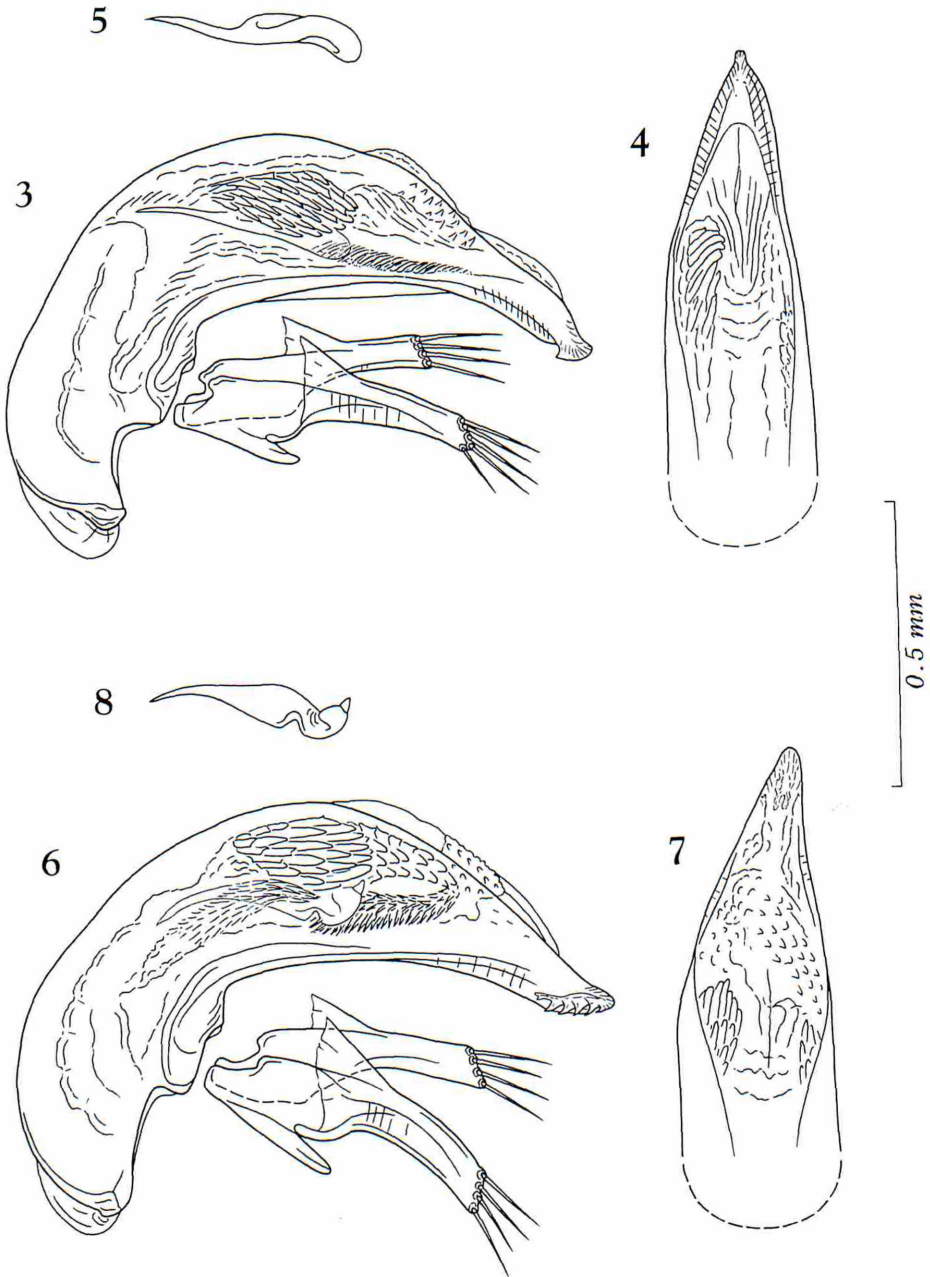
Length: 5.00–5.90 mm (from apical margin of clypeus to apices of elytra).

Very closely similar to *K. elongata* and practically indistinguishable from it in external morphology, but the aedeagus is strikingly different, above all in the toothed terminal portion of the aedeagal apical lobe.

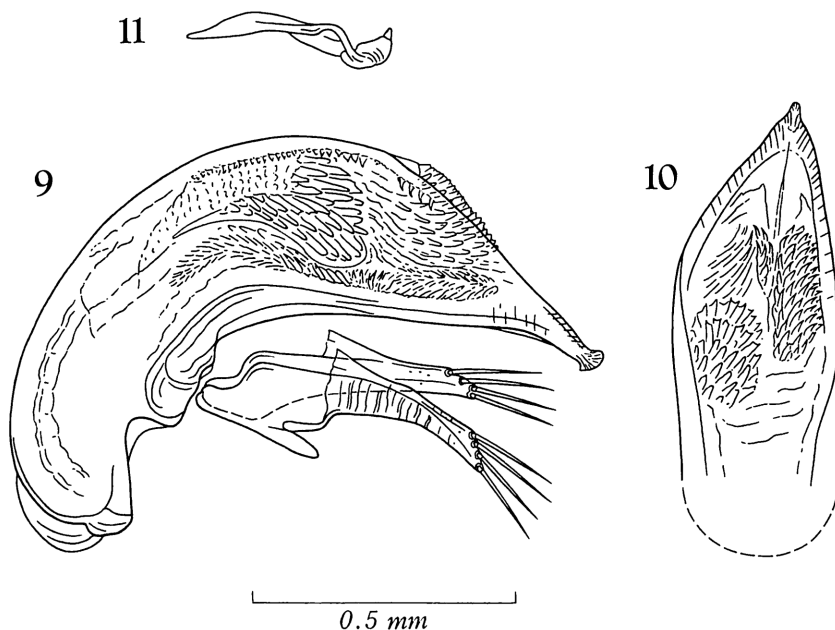
A little larger on an average than *K. elongata* though the ranges of variation widely overlap each other. Identical with it in coloration, pubescence and microsculpture. Head perfectly identical with that of *K. elongata*. Pronotum somewhat shorter on an average than in *K. elongata*, though the difference is not definite; otherwise it agrees well with that of the latter. Elytra and legs as in *K. elongata*. Standard ratios of body parts as follows: PW/HW 1.44–1.59 (M 1.49), PW/PL 0.95–1.02 (M 0.98), PW/PA 1.44–1.57 (M 1.49), PW/PB 1.52–1.63 (M 1.57), PB/PA 0.89–1.02 (M 0.95) [PA/PB 0.98–1.13 (M 1.05)], EW/PW 1.68–1.85 (M 1.74), EL/PL 2.63–2.83 (M 2.74), EL/EW 1.55–1.66 (M 1.61).

Male genital organ basically similar to that of *K. elongata*, small and moderately sclerotized, but strikingly different from the latter in the unique conformation of aedeagal apical part. Aedeagus nearly one-third as long as elytra, fairly short and robust, strongly arcuate, and gradually tapered towards apex from the level of apical orifice, with the dorsal margin semicircularly rounded in profile; basal part elongate, curved ventrad, deeply emarginate at the sides of basal orifice at its posterior part, and provided with a small but differentiated sagittal aileron; apical part longitudinally hollowed on the ventral side and fringed with a longitudinal row of five or six stout teeth on each side of the hollow; ventral edge becoming narrowly lamellate in apical third, the lamella bisecting the ventral hollow at the terminal portion; viewed dorsally, apical lobe inclined to the left, narrow in apical part, gradually tapered apicad, and ending in a blunt extremity; viewed laterally, apical lobe broad, feebly curved ventrad and slightly reflexed at the blunt extremity; ventral margin widely emarginate in profile. Inner armature basically similar to that of *K. elongata*, but the teeth-patches are apically connected by an irregular row of sclerotized teeth; copulatory piece one-third as long as aedeagus, with the left margin deeply sinuate just before the reflexed apical part, which bears a minute accessory cone at the dorso-apical end. Styles large and fairly broad, left style longer than the right, each obliquely truncated at the apex and bearing four short apical setae.

Type series. Holotype: ♂, 23–V–1982, Y. NISHIKAWA leg. Allotype: ♀, 17–XI–1978, S. UÉNO leg. Paratypes: 1 ♀, 10–VII–1978, S. UÉNO leg.; 2 ♂♂, 4 ♀♀, 23–IX–1978, S. MINATO leg. (found in baited traps set by S. UÉNO on 10–VI–1978); 1 ♂, 23–V–1982, S. MINATO leg. (found in a baited trap set by S. MINATO on 4–X–1981); 3 ♂♂, 10 ♀♀ (incl. 2 teneral ♀♀), 23–V–1982, Y. NISHIKAWA leg.; 1 ♂, 1 ♀, 30–V–1982, S. TANAKA leg. All deposited in the collection of the Department of Zoology, National



Figs. 3–8. Male genitalia of *Kusumia* spp.; left lateral view (3, 6), apical part of aedeagus, dorso-apical view (4, 7), and separated copulatory piece (5, 8). — 3–5. *K. elongata* S. UÉNO, sp. nov., from Shimokodani-kô Adit of the Kishû Mines. — 6–8. *K. dentata* S. UÉNO, sp. nov., from Shimonosako-kô Adit of the Rokkandani Mines.



Figs. 9–11. Male genitalia of *Kusumia laticollis* S. UÉNO, sp. nov., from the Kurozô-dani on Mt. Nodakehōshi; left lateral view (9), apical part of aedeagus, dorso-apical view (10), and separated copulatory piece (11).

Science Museum (Nat. Hist.), Tokyo.

Type locality. Shimonosako-kô Adit of the Rokkandani Mines, at Koguchi of Kaminagai in Kumanogawa-chô, Wakayama Prefecture, Central Japan.

Notes. Though closely related to *K. elongata*, this new species is quite unique in the toothed terminal portion of the aedeagal apical lobe, which reminds us of the upper jaw of certain mammals. I have never seen such a strange structure in the male genitalia of trechine beetles. In *Trechiana spinulifer* S. UÉNO (1985 b, pp. 168, 172, figs. 3–4), the aedeagal apical lobe bears numerous recurved spinules on the ventral surface, a peculiarity that is quite exceptional in the Trechinae, but the structure is file-like and not comparable with the jaw-like apical lobe of *K. dentata*. I cannot find any convincing explanation how such a remarkable structure has mutationally developed in the present species without modification of fundamental morphology of the aedeagus and its inner armature.

The type locality of this interesting species is an abandoned adit of a copper mine lying on the right side of an open valley, the Rokkan-dani, at an elevation of about 100 m. Only 3.3 km distant to the south by east from Shimokodani-kô, the type locality of *K. elongata*, it is separated from the latter by the valley of the Akagi-gawa River, a tributary of the Kumano-gawa, and besides, it was much larger, extending almost horizontally and branching off into several long galleries. A narrow gutter with slowly flowing water ran along one of them. The trechine beetle was first discovered just in-

side the large entrance but seemed rare at that part, since only two living females were obtained on three visits though baited traps attracted half a dozen specimens. Later, however, more favourable habitat was located by NISHIKAWA about 80 m inside. It was a heap of muddy rock debris formed by roof-falling and fed by a continuous trickling from the ceiling. It is unfortunate that the entrance to this biologically interesting adit has been so completely closed with reinforced concrete, that the trechine beetle is no more obtainable.

Kusumia laticollis S. UÉNO, sp. nov.

(Figs. 9–11)

Kusumia sp. D: TANAKA, 1993, Kuroshio, Gobô, (12), p. 13.

Length: 4.85–5.50 mm (from apical margin of clypeus to apices of elytra).

Externally close to *K. elongata* and agreeing with it in many respects, but the prothorax is broader and more strongly contracted behind and the elytra are a little less elongate on an average. Strikingly different from *K. elongata* in configuration of aedeagus and its inner armature.

Similar to *K. elongata* in coloration, pubescence and microsculpture. Head as in *K. elongata*, but the genae are usually a little more convex. Pronotum broader, about as wide as long, widest at about three-fourths from base, and more strongly contracted at both apex and base in most specimens; PW/HW 1.51–1.58 (M 1.54), PW/PL 1.00–1.03 (M 1.02), PW/PA 1.50–1.55 (M 1.53), PW/PB 1.53–1.65 (M 1.61), PB/PA 0.93–0.98 (M 0.95) [PA/PB 1.02–1.08 (M 1.06)]; sides more strongly rounded in front, more rapidly convergent posteriad, more deeply sinuate at a level between basal sixth and fifth, and then either subparallel or slightly dilated towards sharp hind angles; apex always wider than base. Elytra similar to those of *K. elongata*, though somewhat shorter on an average than the latter; EW/PW 1.66–1.70 (M 1.69), EL/PL 2.65–2.77 (M 2.71), EL/EW 1.54–1.60 (M 1.58). Ventral surface and legs as in *K. elongata*.

Male genital organ fairly small though rather heavily sclerotized. Aedeagus about one-third as long as elytra, short but voluminous, high at the middle, with the dorsal margin semicircularly rounded in profile; basal part large, strongly curved ventrad, deeply emarginate at the sides of basal orifice, and provided with a small but well differentiated sagittal aileron; ventral edge very narrowly lamellate at the base of apical lobe; viewed dorsally, apical part asymmetrical, scalene triangular, very broad at the base, and rather rapidly narrowed towards the tip, which is produced into a terminal tubercle; viewed laterally, apical lobe narrow, ventro-apically produced and slightly tapered, with the tip dorso-ventrally dilated into a button; ventral margin feebly sinuate in profile. Inner sac wholly covered with poorly sclerotized scales, which become sclerotized near apical orifice and at the dorsal and ventral sides; two differentiated teeth-patches present, one at about middle and the other inside apical orifice, the former elongate, sigmoidally curved, and extending from the left ventral side to near apical

orifice, the latter small and lying near apical orifice; copulatory piece similar to that of *K. dentata* but more widely twisted. Styles large though slender, left style a little longer than the right, each obliquely truncated at the apex and bearing four thin apical setae.

Type series. Holotype: ♂, allotype: ♀, 2-X-1983, S. TANAKA leg. Paratypes: 1 ♂ (teneral), 19-VIII-1979, S. TANAKA leg.; 2 ♂♂, 2 ♀♀, 2-X-1983, S. TANAKA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Mt. Nodakehōshi, Kurozō-dani, 630 m in altitude, in Hongū-chō of Wakayama Prefecture, Central Japan.

Notes. This is an upper hypogean species discovered at the upper part of the Kurozō-dani Valley, a tributary of the Ohtō-gawa River, on the southern slope of Mt. Nodakehōshi of the Ohtō Mountains. The locality is 15 km distant to the west by south in a bee-line from Shimokodani-kō Adit, the type locality of *K. elongata*, and is at an elevation of 630 m.

Judging from the characteristic conformation of the copulatory piece, this species belongs to the *elongata* group beyond doubt, but varies to some extent towards the *tanakai* group to be dealt with on the following pages. Its male genitalia are particularly similar to those of *K. australis* of the latter species-group (cf. Figs. 18–19), though differing in critical points. Anyway, this new species and *K. australis* can be regarded as the links between the two species-groups, which must have been derived from a common ancestor.

In the summer of 1979, an extremely teneral male of this trechine beetle was found from beneath a rather thin colluvium deposited near a fork of the valley shaded by deciduous broadleaved trees. It was not easy to reach this place, because the sides of the valley were very steep and had no trails leading to the bottom. Accompanied with TANAKA, NISHIKAWA and NOTO, I visited the locality on May 22, 1982, but failed in obtaining additional specimens. However, half a dozen fully mature specimens were finally collected by TANAKA more than four years after the discovery of the immature insect. They were met with by excavating colluvia near the fork to the underlying mother rock. Soon after that, the bottom of the valley was unfortunately buried under a huge mass of rock debris dropped from a constructing site of a forestry road. Since no other habitats have been found out in spite of extensive searches made by TANAKA, this trechine beetle has become a species far removed from us.

***Kusumia tanakai* S. UENO, sp. nov.**

(Figs. 12–15)

Kusumia sp. E: TANAKA, 1993, Kuroshio, Gobō, (12), p. 13.

Kusumia sp. F: TANAKA, 1993, Kuroshio, Gobō, (12), p. 14.

Kusumia sp. G: TANAKA, 1993, Kuroshio, Gobō, (12), p. 14.

Length: 4.50–5.10 mm (from apical margin of clypeus to apices of elytra).

Smaller on an average than *K. laticollis* and distinguished at first sight from it by the larger head and the different configuration of pronotum which is wider at the apex and narrower at the base. Strikingly different from *K. laticollis* in the peculiar configuration of aedeagus and its inner armature, above all, in the exceptionally narrow apical lobe and the small reniform copulatory piece.

Body pubescent as in the species of the *elongata* group; depigmented and apterous. Colour reddish brown, shiny, not iridescent on elytra; palpi, apical halves of antennae, venter of hind body, and legs dark yellowish brown, more or less lighter than dorsum.

Head fairly large, subquadrate, about as wide as or slightly wider than long, widest at a level between supraorbital pores, and more rapidly narrowed posteriorly than anteriorly; frontal furrows deeply impressed, not angulate at middle, and gently arcuate in front; microsculpture sharply impressed, mostly consisting of wide meshes; gena lightly convex, moderately so at the posterior parts; neck wide, with the anterior constriction distinct though not sharp; labrum widely emarginate at the apex; mandibles relatively stout though slender at the arcuate apical parts; mentum tooth narrow and simple; palpi slender; antennae slender, extending a little beyond the middle of elytra in ♂, usually a little shorter than that in ♀, segment 2 the shortest, about four-ninths as long as segment 3, 4 or 5, segments 6–10 gradually decreasing in length towards apex, each subcylindrical, segment 6 about 5 times as long as wide, terminal segment about as long as segment 8, obviously longer but narrower than scape.

Pronotum cordate, wider than head, usually about as long as wide though sometimes longer than wide, widest at about three-fourths from base, and much more strongly contracted posteriorly than anteriorly; PW/HW 1.40–1.50 (M 1.45), PW/PL 0.93–1.03 (M 0.99), PW/PA 1.40–1.50 (M 1.43), PW/PB 1.59–1.71 (M 1.64); sides narrowly bordered throughout, moderately arcuate in front, nearly straight behind the middle, distinctly sinuate at a level between basal seventh and sixth, and then usually divergent towards hind angles though sometimes subparallel to each other; marginal setae as in the species of the *elongata* group; apex either slightly emarginate or nearly straight, always distinctly wider than base, PB/PA 0.84–0.93 (M 0.88) [PA/PB 1.08–1.19 (M 1.14)]; front angles moderately produced forwards though rounded; hind angles always sharp, sometimes very sharp, and usually protrudent postero-laterad; base shallowly but widely emarginate; dorsum moderately convex and densely covered with fairly long, suberect hairs, usually with a vague longitudinal depression on each side at the level of the widest part; microsculpture mostly distinct and consisting of fine transverse lines, which partially form reticulation; dorsal sculptures as in *K. elongata* though devoid of postangular carinae. Lateral expansion of propleura slightly visible from above.

Elytra subovate, evidently wider than prothorax and more than a half longer than fore body, widest at about middle, and more gradually narrowed towards humeral angles than towards apices, with broad basal parts due to prominent, sometimes almost subtuberculate shoulders; EW/PW 1.63–1.73 (M 1.69), EL/PL 2.55–2.72 (M 2.65),

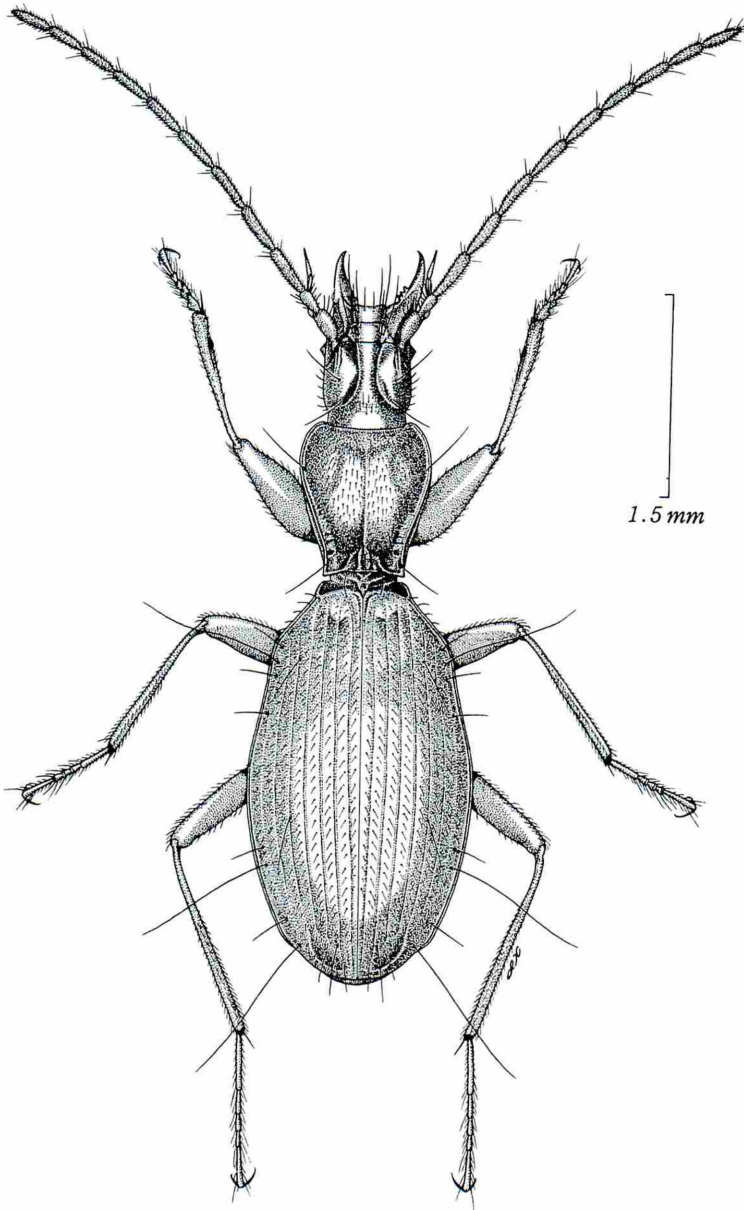


Fig. 12. *Kusumia tanakai* S. UENO, sp. nov., ♂, from Nan-daki in the Gôji-dani Valley.

EL/EW 1.56–1.63 (M 1.59); prehumeral borders oblique, always slightly curved outwards at the anteriormost portions, and fringed with five or six hairs; sides slightly *emarginate* behind shoulders, moderately arcuate at middle, and rather narrowly and almost conjointly rounded at apices, each with a slight preapical *emargination*; dorsum

moderately convex though longitudinally depressed on the disc, with a round depression in the basal area delimited on each side by rather prominent basal carina, which is formed by the basal portion of interval 5; apical declivity steep; microsculpture consisting of fine transverse lines partially forming wide meshes, though more or less obliterated; striae superficial and indistinctly crenulate, becoming shallower and finer at the side, stria 7 and anterior half of 8 sometimes evanescent, striae 1–3 more or less deepened in basal depression, stria 8 hardly deepened apicad though perceptible; scutellar striole very short; apical striole short, shallow and gently curved, sometimes fragmented, either joining stria 5 or directed to that stria; intervals flat, each with an irregular row of suberect pubescence which extends onto the field of apical striole; apical carina very obtuse; stria 3 without dorsal pore; preapical pore ordinary; stria 5 with two setiferous dorsal pores at $1/7-1/6$ and $1/2-2/3$ from base, respectively.

Ventral surface and legs as in *K. elongata*, though the latter are somewhat shorter.

Male genital organ fairly large and moderately sclerotized. Aedeagus about three-sevenths as long as elytra, slightly compressed, strongly bent ventrad at the basal part, gradually narrowed apicad from behind middle, and produced into a narrow apical lobe evidently curved ventrad; basal part fairly elongate, lightly emarginate at the sides of basal orifice, and provided with a narrow hyaline sagittal aileron; viewed dorsally, apical lobe very narrow, parallel-sided, slightly constricted just before the apex which is slightly dilated and subtruncated at the extremity; viewed laterally, apical lobe ventrally arcuate, gradually tapered, and longitudinally dilated at the tip to form an oblique platelet which is more produced dorsally than ventrally; ventral margin nearly straight at middle in profile. Inner sac wholly covered on the right to the ventral sides with a large mat of heavily sclerotized teeth of various size and shape, and armed with two copulatory pieces and a patch of large, heavily sclerotized teeth connecting the pieces; teeth-mat particularly compact at the ventral side and along the right dorsal edge, and fused at the right side of apical orifice to form a large subvertical plate protrudent from the orifice; at the proximal half of the ventral side, the teeth become modified into numerous long aciculae directed dorso-apically; left copulatory piece fusiform, about two-sevenths as long as aedeagus, obliquely lying at the proximal part of inner sac, longitudinally convex on the left dorsal side, and loosely covered with large sclerotized scales; smaller copulatory piece lying at the right ventral side of the left sclerite, only a half as long as the latter, moderately elongate and lightly curved dorsad, with narrowly produced proximal end; connecting teeth-patch composed of very large, compactly aggregated teeth. Styles very slender though not large, with rather straight apical parts, each of which is obliquely truncated at the dorsal side of the terminal portion; left style longer than the right and provided with a thin ventral apophysis; each style usually with four thin apical setae of unequal length, one at the ventral extremity and the others on the truncated part, one of the latter rarely missing on one style.

Type series. Holotype: ♂, Nan-daki, 240 m alt., 19-IX-1981, S. TANAKA leg. Allotype: ♀, Nan-daki, 250 m alt., 21-IX-1981, S. TANAKA leg. Paratypes: 1 ♂, Nan-daki, 240 m alt., 19-IX-1981, S. TANAKA leg.; 2 ♂♂, 1 ♀, 250 m alt., 21-IX-1981, S.

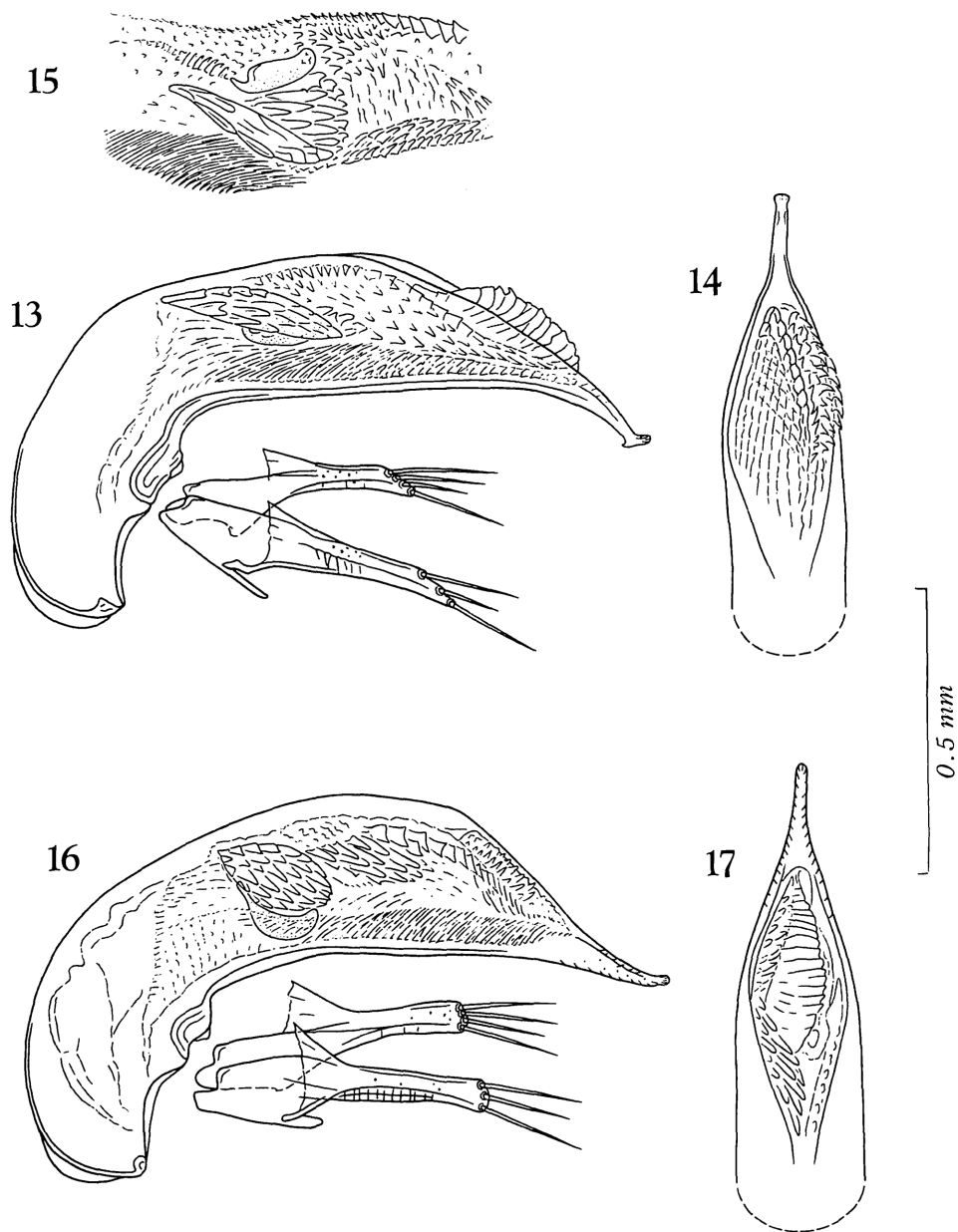
TANAKA leg.; 1 ♀, Taki-dani, 150 m alt., 28-X-1979, S. TANAKA leg.; 2 ♂♂, Taki-dani, 150 m alt., 23-IX-1981, S. TANAKA leg.; 1 ♀, Taki-dani, 150 m alt., 10-IV-1983, S. TANAKA leg.; 1 ♀, Gôji-dani, 180 m alt., 10-VII-1977, S. TANAKA leg.; 2 ♀♀, Gôji-dani, 180 m alt., 28-VII-1979, S. TANAKA leg.; 1 ♀, Gôji-dani, 180 m alt., 17-III-1980, Y. NISHIKAWA leg.; 1 ♀, Gôji-dani, 180 m alt., 18-III-1980, H. MINATO leg.; 1 ♀, Kodani-tôgé, 250 m alt., 15-X-1983, S. TANAKA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Localities of the type series. Nan-daki, 240–250 m in altitude (type locality!), Taki-dani, 150 m in altitude, and Gôji-dani, 180 m in altitude, all in the Gôji-dani Valley at Shagawa of Shirahama-chô, and Kodani-tôgé, 250 m in altitude, at Hisagi of Hikigawa-chô, all in Wakayama Prefecture, Central Japan.

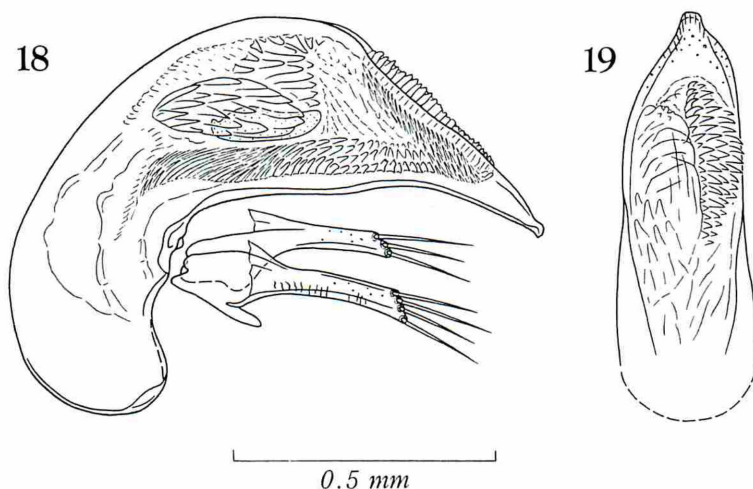
Further specimens examined. 1 ♀ (teneral), Sotoba-tôgé, 280 m alt., Kawaradani, Hikigawa-chô, Wakayama Pref., 4-IX-1982, S. TANAKA leg.; 1 ♀, prospecting adit at Shimodaira, 90 m alt., Ayukawa, Ohtô-mura, Wakayama Pref., 7-I-1979, H. MINATO & S. TANAKA leg. (found in a baited trap set by H. MINATO & S. TANAKA on 9-XII-1978); 1 ♀, same adit, 16-XII-1979, S. TANAKA leg. (All NSMT.)

Notes. This new species has some resemblance to *K. laticollis* but is recognized at first sight on the larger head, narrower pronotal base, more prominent humeral angles of the elytra, and above all, on the peculiar conformation of the male genitalia. It should be discriminated in a particular species-group together with the two succeeding species, *K. latior* and *K. australis*, mainly in view of the unique aedeagal inner armature. This species-group, to be called the *tanakai* group, is characterized by a combination of the following character states: relatively small species with rather short prothorax and ovate elytra; prothorax cordate, about as long as wide, and contracted at the base which is always narrower than apex; elytra ovate, wholly pubescent, with prominent shoulders and ciliated prehumeral borders, the fringing hairs of which are sometimes reduced in number; elytral stria 3 usually devoid of setiferous dorsal pore, though a dorsal pore bearing shorter seta rarely occurs on one elytron (cf. Fig. 21); elytral stria 5 always with two setiferous dorsal pores; aedeagus variable in configuration, but always bearing a heavily sclerotized teeth-mat covering the right to the ventral sides of inner sac, a large plate formed by fusion of sclerotized teeth at apical orifice, two copulatory pieces just before the middle, one at the left side formed by fusion of sclerotized scales and the other at the right ventral side reniform, and a patch of large, heavily sclerotized teeth either between the two copulatory pieces or dorso-posterior to them.

The left copulatory piece is of very peculiar conformation, probably homologous to the right dorsal teeth-patch in *K. elongata*. In the latter species, however, the component teeth are connected only with membrane and not fused together to form a spatular sclerite. On the other hand, the right ventral copulatory piece seems to correspond to the apical part of the copulatory piece in the members of the *elongata* group. These homologies may be regarded as a proof of direct relationship between the *elongata* and the *tanakai* groups, of which the latter seems more derivative than the former.



Figs. 13–17. Male genitalia of *Kusumia* spp.; left lateral view (13, 16), apical part of aedeagus, dorso-apical view (14, 17), and cut open and extended inner sac, showing copulatory pieces (15). — 13–15. *K. tanakai* S. UÉNO, sp. nov., from Nan-daki in the Gôji-dani Valley. — 16–17. *K. latior* S. UÉNO, sp. nov., from the Hirano-dani in Ryûjin-mura.



Figs. 18–19. Male genitalia of *Kusumia australis* S. UENO, sp. nov., from the Kokashi-tôgê; left lateral view (18), and apical part of aedeagus, dorso-apical view (19).

Kusumia tanakai and the trechines probably referable to it have so far been known from six sites distributed on the low hills stretching from northeast to southwest between the lower parts of the Tonda-gawa and the Hiki-gawa Rivers at the southwestern coastal area of the Kii Peninsula. Most specimens were collected at three places of the Gôji-dani Valley, a tributary of the Tonda-gawa River, running from east by north to west by south at the central part of the hilly area, one at the southeastern foot of Shironomori-yama Hill about 180 m above the sea, and another at Nan-daki near the head of the Taki-dani, a southern branch of the Gôji-dani Valley, at an elevation of 240–250 m on Gyôtoku-san Hill. The former is about 23 km distant to the west-southwest from the Kurozô-dani, the type locality of *K. laticollis*, and the latter is about 1.5 km distant to the south by west from the former. The other collecting site lies near the mouth of the Taki-dani branch only 150 m above sea-level. At respective collecting sites, *K. tanakai* was dug out from colluvia deposited at the sides of narrow streams shaded by deciduous and evergreen broadleaved trees.

At the southeastern side of the Kodani-tôgê about 1.2 km south by west of Nan-daki beyond Gyôtoku-san Hill, a female specimen of this species was met from a colluvium deposited at the source of a small branch of the Hiki-gawa River at an elevation of 250 m. The standard ratios in this specimen (4.65 mm in the length of body) are as follows: PW/HW 1.44, PW/PL 1.03, PW/PA 1.44, PW/PB 1.71, PB/PA 0.84 [PA/PB 1.19], EW/PW 1.65, EL/PL 2.67, EL/EW 1.57.

True specific identity of the remaining two populations is not certain because of inadequacy of available materials. One of them was found at the southeastern side of the Sotoba-tôgê at an altitude of 280 m, which is about 3.7 km distant to the east by north beyond the watershed from the northernmost collecting site of *K. tanakai* in the

Gôji-dani Valley, and the other was met in a prospecting adit excavated on the left side of the Aigagô-gawa, a tributary of the Tonda-gawa River, about 6.7 km north-northeast of the same collecting site in the Gôji-dani. At the former locality, only a single general female was found from a colluvium deposited at the source of the Kawara-dani, a short branch of the Hiki-gawa River. Because of the extreme immaturity of the specimen (5.05 mm in the length of body), it is impossible even to take exact measurements of its body parts for calculating standard ratios, though it appears conspecific with the Gôji-dani specimens. Unfortunately, this population is no more accessible, since the colluvium was buried deep under the soil and rock debris thrown down by road works.

The latter population, found in a prospecting adit only 90 m above sea-level, has been known from four females, of which only one was taken by hands and the other three were caught by baited traps. The beetle is extremely rare probably because of unfavourable environment in the small adit. Two of the four specimens now at hand are relatively large (4.95–5.00 mm in the length of body), though not larger than the largest specimen from the Gôji-dani Valley. The standard ratios of their body parts are almost identical with those in the type series: PW/HW 1.45, 1.48, PW/PL 0.98, 1.02, PW/PA 1.46, 1.46, PW/PB 1.64, 1.65, PB/PA 0.89, 0.89 [PA/PB 1.12, 1.13], EW/PW 1.61, 1.61, EL/PL 2.55, 2.60, EL/EW 1.61, 1.59. In these specimens, however, the elytra are relatively broad at the basal part and have somewhat less oblique prehumeral borders. They may be discriminated as a geographical race, though I do not prefer to give them a new subspecific name at this place due to the absence of males.

Kusumia latior S. UÉNO, sp. nov.

(Figs. 16–17, 20)

Kusumia sp. I: TANAKA, 1993, Kuroshio, Gobô, (12), p. 14.

Length: 4.70–5.15 mm (from apical margin of clypeus to apices of elytra).

Closely allied to *K. tanakai*, but recognized at first sight on its broad facies, particularly on broad pronotal base and broad elytra. Obviously different also in configuration of aedeagal apical lobe and of copulatory pieces.

Colour, pubescence and microsculpture as in *K. tanakai*. Head similar to that of *K. tanakai*, but the antennae are somewhat shorter and thicker, reaching apical four-ninths of elytra in ♂, slightly shorter than that in ♀, with segment 6 about 4.5 times as long as wide. Pronotum obviously less contracted at base than in *K. tanakai*, widest at about three-fourths from base and more gradually narrowed posteriad, with sides more widely arcuate in front, usually more shallowly sinuate at about basal fifth or slightly behind that level, and then either slightly divergent towards hind angles or subparallel to each other; PW/HW 1.44–1.49 (M 1.47), PW/PL 1.00–1.03 (M 1.02), PW/PA 1.38–1.46 (M 1.43), PW/PB 1.46–1.53 (M 1.49); apex almost straight, about as wide as or slightly wider than base, PB/PA 0.92–0.99 (M 0.96) [PA/PB 1.01–1.09 (M 1.04)]; base nearly straight at middle, hind angles less sharp than in *K. tanakai* and only a little pro-

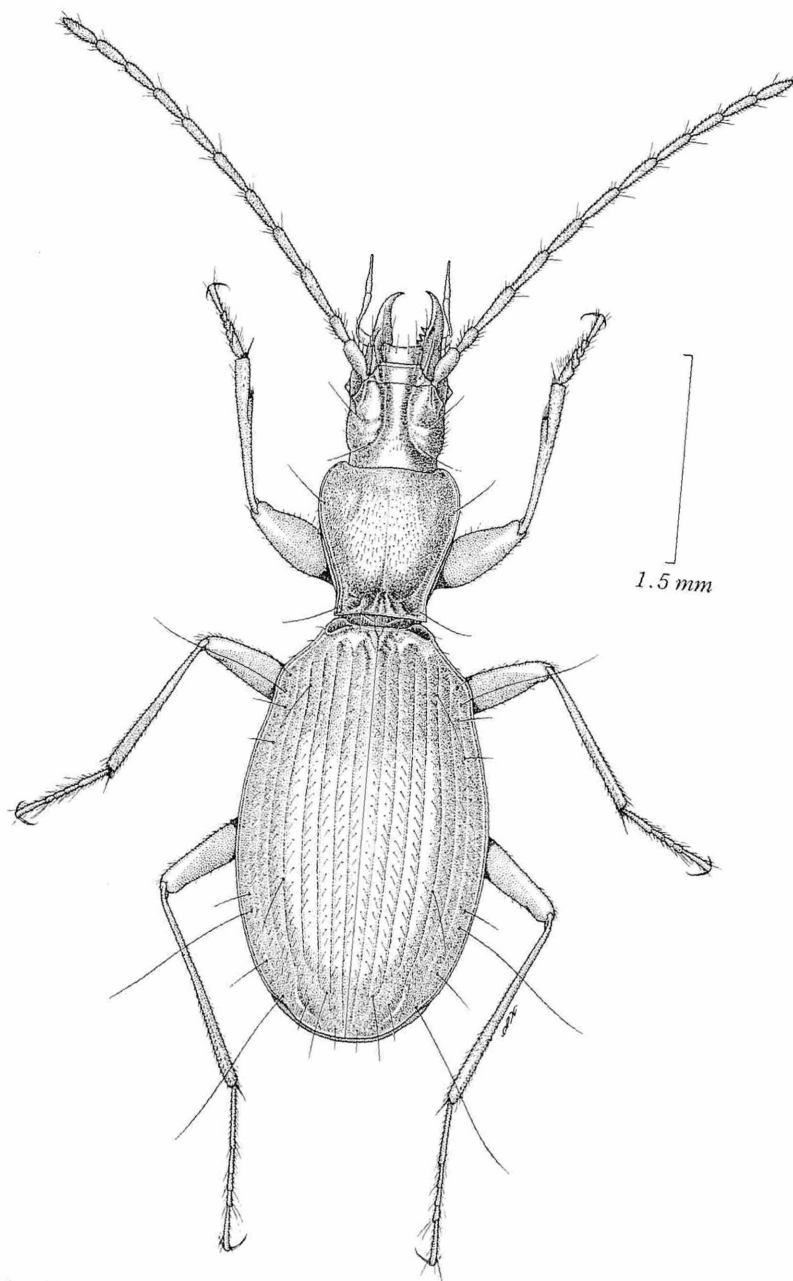


Fig. 20. *Kusumia latior* S. UÉNO, sp. nov., ♂, from the Hirano-dani in Ryūjin-mura.

trudent postero-laterad; dorsum more convex than in *K. tanakai*, though similarly sculptured to that of the latter. Elytra evidently broader than in *K. tanakai*, widest at about middle, ampler at both basal and apical parts, and more widely rounded at apices; EW/PW 1.74–1.81 (M 1.78), EL/PL 2.70–2.89 (M 2.79), EL/EW 1.50–1.56 (M 1.54); shoulders less prominent and more widely rounded; prehumeral borders less oblique and almost straight; sides very slightly emarginate behind shoulders, and then moderately arcuate to apices; dorsum more clearly striate, though the striation is generally identical with that of *K. tanakai*; chaetotaxy as in *K. tanakai*. Ventral surface and legs as in *K. tanakai*, though the latter are somewhat slenderer.

Male genital organ basically similar to that of *K. tanakai*, but markedly different in configuration of aedeagal apical lobe and of the apical part of styles as well as in details of inner armature. Aedeagus two-fifths as long as elytra, lightly compressed, rather high throughout, moderately curved ventrad at the basal part, rather abruptly narrowed apicad in apical third in profile, and produced into a narrow apical lobe, which is evidently reflexed at the terminal portion and devoid of accessory terminal platelet; basal part fairly large, moderately emarginate at the sides of basal orifice, and provided with a small hyaline sagittal aileron; viewed dorsally, apical lobe very narrow, parallel-sided in apical half, and simply ending in a blunt extremity; viewed laterally, apical lobe gradually narrowed to narrow terminal part, obviously reflexed in apical half, and slightly tuberculate at the extremity; in profile, ventral margin hardly concave from behind middle to the base of apical lobe. Inner armature as in *K. tanakai*, but the teeth-mat is less extensive, particularly at the ventral side, with the apical plate smaller and less protrudent, the left copulatory piece is shorter and more densely covered with sclerotized scales, the right copulatory piece is larger, more regularly arcuate and with longer basal projection, and the patch of large sclerotized teeth lies dorso-posterior to copulatory pieces and wholly visible in lateral view. Styles fairly large and slender, with straight apical parts whose terminal portions are not obliquely truncated at the dorsal side, left style longer than the right, each bearing three or four thin setae at the apex; in one of the paratypes, a short extra seta present on the left style in addition to the usual four.

Type series. Holotype: ♂, 7–VIII–1982, S. TANAKA leg. Allotype: ♀, 2–VIII–1982, S. TANAKA leg. Paratypes: 1 ♂, 1 ♀, 2–VIII–1982, S. TANAKA leg.; 1 ♂, 7–VIII–1982, S. TANAKA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Hirano-dani, 520 m in altitude, at Hirano of Ryūjin-mura in Wakayama Prefecture, Central Japan.

Notes. This is again a lost species merely known from the type series of five examples collected on only two occasions. They were found from a colluvium deposited at the side of a branch gully on the right side of the Hidaka-gawa River at an elevation of 520 m. The collecting site is about 25 km distant to the north-northwest from the Kurozō-dani, the type locality of *K. laticollis*, and about 27.5 km distant to the north by east from the prospecting adit at Shimodaira, the northernmost known locality of

Kusumia referable to *K. tanakai*. It is unfortunate that the colluvium was first washed away by a flood, and that the gully itself was thickly cemented later for construction of a forestry road. No other habitats of the species have been met with so far even by extensive searches made by TANAKA.

***Kusumia australis* S. UÉNO, sp. nov.**

(Figs. 18–19, 21)

Kusumia sp. H: TANAKA, 1993, Kuroshio, Gobô, (12), p. 14.

Length: 4.60–5.25 mm (from apical margin of clypeus to apices of elytra).

Similar in many respects to *K. tanakai*, with basally contracted pronotum and narrow elytra, but the pronotal hind angles are sharper and the humeral angles of elytra are more salient. Strikingly different from *K. tanakai* in the short voluminous aedeagus with short broad apical lobe.

Colour as in *K. tanakai*, but often more light-coloured with paler appendages. Pubescence and microsculpture as in *K. tanakai*. Head as in *K. tanakai*, though the genae are more evenly convex; antennae fairly long and slender, reaching apical third of elytra in ♂, apical two-fifths of elytra in ♀. Pronotum similar to that of *K. tanakai*, though less convex on dorsum and with sharper hind angles; PW/HW 1.42–1.53 (M 1.47), PW/PL 0.95–1.04 (M 1.00), PW/PA 1.38–1.47 (M 1.42), PW/PB 1.61–1.73 (M 1.66); apex always wider than base, PB/PA 0.82–0.90 (M 0.86) [PA/PB 1.11–1.22 (M 1.16)], with front angles relatively wide and not much produced; base widely emarginate, hind angles sharp and protrudent more posteriorly than laterally; basal part longer than in *K. tanakai*.

Elytra elongated ovate, widest at about middle, and more gradually narrowed posteriorly than anteriorly; EW/PW 1.63–1.73 (M 1.69), EL/PL 2.65–2.78 (M 2.72), EL/EW 1.59–1.64 (M 1.63); shoulders prominent and subtuberculate; prehumeral borders oblique, slightly emarginate, and bearing a fringe of four or five hairs; sides slightly emarginate behind humeral angles, moderately arcuate at middle, and rather widely and almost conjointly rounded at apices, each with a slight preapical emargination; dorsum moderately convex, less so on the disc, and with a round depression in basal area; striation as in *K. tanakai*, though all the striae are more clearly impressed; intervals as in *K. tanakai*, both basal and apical carinae distinct though obtuse; stria 3 usually devoid of dorsal pore, but in the holotype and a female paratype, a dorsal pore bearing a short seta exists on the left elytron at 1/8–1/7 from base; preapical pore lying at the apical anastomosis of striae 2 and 3 just behind the level of the terminus of apical striole, and much more distant from apex than from suture; stria 5 always with two setiferous dorsal pores at about 1/6 (or a little before that level) and 1/2–3/5 (usually 3/5) from base, respectively.

Ventral surface as in *K. tanakai*. Legs slenderer than in *K. tanakai*, though structurally identical with the latter; tarsomere 1 about as long as tarsomeres 2–4 together in

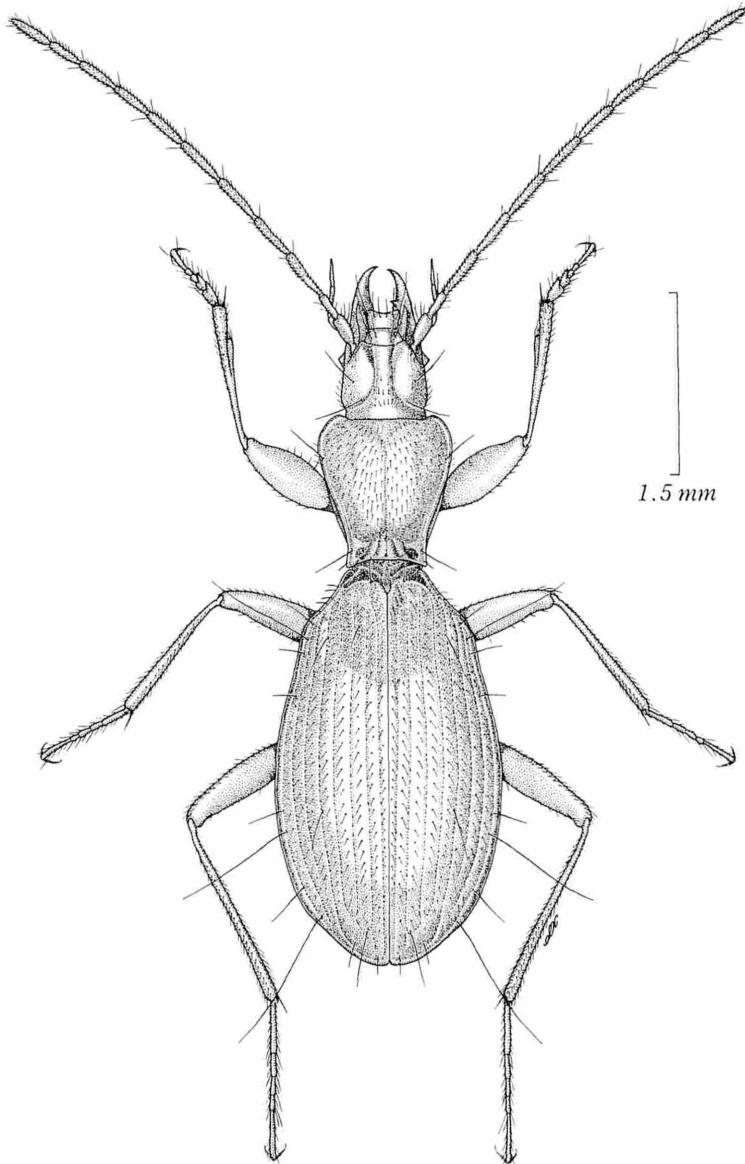


Fig. 21. *Kusumia australis* S. UENO, sp. nov., ♂, from the Kokashi-tôgê.

mesotarsus, a little shorter than that in metatarsus; in ♂, protarsomeres 1 and 2 widely dilated and conspicuously produced inwards at apices.

Male genital organ similar in basic conformation to those of *K. tanakai* and *K. latior*, but strikingly different in configuration from the latter. Aedeagus short but voluminous, slightly less than one-third as long as elytra, high behind middle, lightly compressed, and strongly curved ventrad at the basal part, with the dorsal margin semicir-

cularly rounded in profile; basal part elongate, rather strongly arcuate, moderately emarginate at the sides of basal orifice, and devoid of sagittal aileron; viewed dorsally, apical lobe short and broad, somewhat asymmetrical, with a large tubercle at the extremity whose tip is subtruncated; viewed laterally, apical lobe elongated subtriangular, produced ventro-apically, and dorsally tuberculate at the extremity; ventral margin slightly convex at middle in profile. Inner sac armed as in the two preceding species, but all the armature is more heavily sclerotized; apical teeth-plate with visible component teeth, though they are fused together; left copulatory piece broader and more densely covered with large sclerotized scales; right copulatory piece larger and more elongate, without narrow projection at the proximal end; connecting teeth-patch extending dorsad and widely visible in lateral view. Styles short though bearing slender apical parts, less obliquely truncated at the dorsal side of the terminal portions than in *K. tanakai*, each provided with three or four thin setae at the apex.

Type series. Holotype: ♂, allotype: ♀, 12-VII-1997, Y. NISHIKAWA leg. Paratypes: 1 ♀, 31-III-1983, Y. NISHIKAWA leg.; 1 ♀, 2-IV-1983, S. TANAKA leg.; 1 ♀, 3-IV-1983, S. TANAKA leg.; 1 ♀, 29-IV-1984, S. TANAKA leg.; 1 ♂, 26-X-1998, A. KITAYAMA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Kokashi-tôgê, 300–320 m in altitude at the south-southeastern side, at Esumi of Susami-chô in Wakayama Prefecture, Central Japan.

Notes. As was already pointed out, *K. australis* shows a close resemblance to *K. laticollis* in the configuration of the male genitalia, though it is doubtless closer to *K. tanakai* than to *K. laticollis* in the external morphology and in the reniform copulatory piece. Further investigations in the southwestern part of the Kii Peninsula are needed for bridging the gap between the *elongata* and the *tanakai* groups of the genus.

This distinctive new species has so far been known from a limited place at the source of a branch of the Esumi-gawa River, about 26 km south-southwest of the Kurozô-dani on the Ohtô Mountains, the type locality of *K. laticollis*, about 19 km southeast of the Kodani-tôgê which is the southernmost known locality of *K. tanakai*, and 300–320 m above sea-level. The Kokashi-tôgê is the southernmost known locality not only of *Kusumia* but of all the anophthalmic trechines distributed in Honshu, the largest main island of Japan. It is for this reason that the present species is named *australis*.

The head of the gully at the source of the Esumi-gawa forks twice and has deposited rather thin colluvia near the forks within an extent of less than 100 m. *Kusumia australis* dwells in these colluvia, usually near the edge of the water of narrow streams or beside underground seepages. Though shaded by deciduous and evergreen undergrowths, the gully as a whole lies in a plantation of cryptomeria cedar, and since the habitats are located only 50 m below the watershed ridge in altitude, they may be rapidly dried up if the trees are felled. This hygrophilous trechine beetle is therefore a threatened species and will be so-recorded on the Red Data Book of the Japanese Government.

Kusumia yoshikawai S. UÉNO, 1960

Kusumia yoshikawai S. UÉNO, 1960, Mem. Coll. Sci. Univ. Kyoto, (B), **27**, pp. 124, 130, fig. 4; type locality: Sanzukôchi on Mt. Ohdaigahara; 1963, Bull. natn. Sci. Mus., Tokyo, **6** [for 1962], p. 112, fig. 1; 1985, Coleopt. Japan Col., Osaka, **2**, p. 80, pl. 15, fig. 18. — CASALE & LANEYRIE, 1982, Mém. Biospéol., Moulis, **9**, p. 91, fig. 58 left. — TANAKA, 1993, Kuroshio, Gobô, (12), p. 13.
Kusumia Yoshikawai: JEANNEL, 1962, Revue fr. Ent., **29**, p. 205.

Length: 4.55–5.35 mm (from apical margin of clypeus to apices of elytra).

This upper hypogean species was originally described on a teneral female and was later (UÉNO, 1963) redescribed on seven topotypical specimens including two males. Since then, more additional specimens have been collected at two sites on Mt. Ohdaigahara-zan, that is, Sanzukôchi and the Nagoya-dani, and two sites in the vicinities of Mt. Oba-ga-miné lying on the northwestern branch ridge of Ohdaigahara-zan. The examples from the former collecting sites agree well with the full redescription given in my 1963 paper, with the exception of the elytral chaetotaxy which shows some variation according to individuals, while those from the latter habitats are more or less different in the shape of prothorax and elytra as well as in certain other details and are separated as a geographical race to be called *K. yoshikawai latipennis*. The chaetotaxial variation in the nominotypical subspecies was already noticed in Japanese (UÉNO, 1985, p. 80), but is worth noting again in English since the elytral chaetotaxy is one of the characters useful for classifying the members of the genus *Kusumia*.

The setiferous dorsal pores of the internal series are almost always absent, but a setiferous pore is present on the left elytron of one female (from the Nagoya-dani), or 6.25% of the 16 specimens examined in total, just as in the species of the *takahasii* group. The external series usually consists of two setiferous dorsal pores, but there are three dorsal pores on the left elytron in one specimen (from Sanzukôchi-yama) or 6.25%, and on the right elytron in two specimens (from the Nagoya-dani) or 12.50% of the total specimens examined. The Nagoya-dani specimen bearing the pore of the internal series is the same female as that possessing three pores of the external series on the right elytron.

Additional specimens examined. 1 ♀, Mt. Ohdaigahara-zan, Sanzukôchi-yama, 1,500 m alt., Kamikitayama-mura, Nara Pref., 13–VIII–1963, A. OKUDA leg.; 1 ♂, same locality, 2–VI–1981, A. NISHIYAMA leg.; 1 ♀, same locality, 25–VI–1981, S. NAOMI leg.; 1 ♀, Mt. Ohdaigahara-zan, Sanzukôchi-yama, 1,400 m alt., Miyagawa-mura, Mié Pref., 24–VI–1984, Y. NISHIKAWA leg.; 1 ♂, same locality and date, but 1,420 m alt., S. UÉNO leg.; 1 ♂, 1 ♀, same locality and date, but 1,500 m alt., S. UÉNO leg.; 1 ♂, 1 ♀, Mt. Ohdaigahara-zan, Nagoya-dani, 1,550 m alt., Kamikitayama-mura, Nara Pref., 23–VI–1984, Y. NISHIKAWA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Notes. *Kusumia yoshikawai* seems rather widely distributed on Mt. Ohdaigahara-zan lying at the southern part of the Daikô Mountains stretching from north to south on the borders of Nara and Mié Prefectures, and the Oba-ga-miné Ridge extending northwestwards from Ohdaigahara-zan towards the Ohminé Mountains. It is, how-

ever, not easy to locate its habitats because of the steep topography of the mountains. Only two collecting sites of the nominotypical subspecies have hitherto been found and one of them, the Nagoya-dani, is adjacent to the southern side of the other, Sanzukôchi-yama, so that actually one small area on Mt. Ohdaigahara-zan is known to harbour this trechine beetle.

Both the southern side of Sanzukôchi-yama and the Nagoya-dani Gully are the sources of the Higashi-no-kawa, the easternmost upper course of the Kitayama-gawa River that empties into the Pacific, while the eastern side of Sanzukôchi-yama belongs to the Nishi-no-tani drainage, one of the upper courses of the Miya-gawa River that empties into the Bay of Isé. However, the watershed is only 100 m or so above the known habitats of *K. yoshikawai*, so that it cannot form a barrier against the subterranean dispersal of the anophthalmic beetle. At the head of the Nishi-no-tani, *K. yoshikawai* is always dug out from small shaded colluvia deposited under small dried cascades, whereas at the head gullies of the Higashi-no-kawa, isolated individuals are usually found from beneath large stones embedded in the ground. Since the latter gullies are rather gentle and do not deposit thick colluvia, the trechine may have been forced to live in the environment that is not upper hypogean but endogean.

Kusumia yoshikawai latipennis S. UÉNO, subsp. nov.

Kusumia sp. A: TANAKA, 1993, Kuroshio, Gobô, (12), p. 13.

Length: 4.80–5.50 mm (from apical margin of clypeus to apices of elytra).

Distinguished at first sight from the nominotypical subspecies by the larger and broader hind body and the usual presence of three setiferous dorsal pores of the external series. Besides, the pronotum is more elongate and usually less contracted at the base, and both the antennae and legs are slenderer.

Slightly larger on an average than the nominotypical subspecies. Head similar to that of the nominotypical subspecies, but the genae are usually less convex and the antennae are somewhat longer and slenderer, the latter reaching the middle of elytra even in ♀, with segment 6 more than 3.5 times as long as wide. Pronotum more elongate than in the nominotypical subspecies, widest at about five-sevenths from base, and more gradually narrowed towards base, which is relatively wide; PW/HW 1.38–1.41 (M 1.40), PW/PL 0.90–0.92 (M 0.91), PW/PA 1.42–1.50 (M 1.46), PW/PB 1.35–1.44 (M 1.41); sides gently arcuate in front, shallowly and widely sinuate behind the middle, and subparallel to each other behind ante-basal sinuation, which is not sharply marked though lying around basal fifth; apex nearly straight and slightly narrower than base, PB/PA 1.01–1.06 (M 1.04) [PA/PB 0.95–0.99 (M 0.97)], with front angles small and not much produced forwards; base nearly straight at middle, gently oblique posteriorly inside each hind angle, which is sharp and produced posteriorly; dorsum convex, pubescent and sculptured as in the nominotypical subspecies.

Elytra ovate, large and ample, obviously larger and broader than in the nominotypical subspecies, widest at about or slightly behind the middle, and almost equally

narrowed towards bases and towards apices, with ample apical parts; EW/PW 1.88–1.91 (M 1.89), EL/PL 2.54–2.68 (M 2.59), EL/EW 1.43–1.48 (M 1.46); shoulders prominent and tuberculate; prehumeral borders similarly oblique to those of the nominotypical subspecies, either straight or very slightly curved outwards at the anteriormost portions, and glabrous except for a hair lying at each external edge of basal transverse furrow; sides slightly emarginate behind humeral angles, rather strongly arcuate at middle, and widely and conjointly rounded at apices, each without appreciable preapical emargination; dorsum well convex, with a distinct round depression in the basal area; striae superficial, becoming shallower at the sides though nearly entire, 1–4 deepened in the basal depression; scutellar striole distinct; apical striole short but fairly deep, moderately curved, and directed to stria 5; intervals flat, each with an irregular row of suberect pubescence, which does not extend onto the field of apical striole; stria 3 without dorsal pore; stria 5 usually with three setiferous dorsal pores at about 1/6, 1/3–2/5 and 5/9–2/3 from base, respectively; in the holotype, the second pore of the external series is missing on the left elytron. Legs, femora in particular, slenderer than in the nominotypical subspecies; tarsomere 1 shorter than tarsomeres 2–4 together in both meso- and metatarsi.

Topotypical male unknown.

Type series. Holotype: ♀, 9–VI–1989, Y. NISHIKAWA leg. Paratypes: 1 ♀ (teneral), 9–VIII–1981, Y. NISHIKAWA leg.; 1 ♀, 24–V–1982, Y. NISHIKAWA leg.; 1 ♀ (teneral), 5–VIII–1984, Y. NISHIKAWA leg. Deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Wasamata-guchi, 720 m in altitude, in Kamikitayama-mura of Nara Prefecture, Central Japan

Further specimens examined. 1 ♂, 1 ♀, Obaminé-tôgé, SSW side, 720 m alt., Kamikitayama-mura, Nara Pref., 9–VI–1989, Y. NISHIKAWA leg. (NSMT).

Notes. I have hesitated long in deciding systematic status of this trechine beetle. Judging from other examples in the genus *Kusumia*, the differences between this trechine and *K. yoshikawai* seem to suffice for recognition of a full species to the former, but such a conclusion can be disputed in view of the coexistence at the Obaminé-tôgé of a somewhat *yoshikawai*-like male with a female very similar to the Wasamata-guchi specimens, even though the male in question possesses rather a large ample hind body as compared with the Ohdaigahara specimens of *K. yoshikawai*. The Wasamata-guchi – Obaminé-tôgé specimens are to some extent intermediate between *K. yoshikawai* and *K. amicum* sp. nov. in the size, body form and elytral chaetotaxy, but are doubtless closer to the former than to the latter, particularly in the existence of the Obaminé-tôgé population. Geographically, the Obaminé-tôgé locality is about 9 km distant to the west by north from Sanzukôchi-yama, the Wasamata-guchi locality is 6.5 km distant to the northeast from the type locality of *K. amicum*, and the two localities are only 650 m apart in a bee-line though separated by a low ridge. Unfortunately, no male specimens have been obtained at Wasamata-guchi in spite of repeated searches made by several entomologists including myself, but genitalic differentiation

does not seem so important in this case in view of the genitalic similarity between *K. yoshikawai* and *K. amicorum*. For the time being, I prefer to regard the Wasamata-guchi – Obaminé-tôgé specimens as belonging to an isolated geographical race of *K. yoshikawai*, leaving the final conclusion for future investigations.

The four specimens of the type series are closely similar to one another, though the second dorsal pore of the external series is missing on the left elytron of one of them. They were dug out, one at a time, from colluvia deposited at the sides of a small branch of the Wasamata-dani, one of the upper courses of the Kitayama-gawa River. This gully is unusually dark being shaded by deciduous broadleaved trees grown on its steep sides.

The Obaminé-tôgé specimens were dug out from a colluvium deposited in a short side gully about 1.6 km down the Shinchaya-dani Valley towards the south-southwest from the pass. Of a pair of the specimens obtained (5.10–5.25 mm in the length of body), the female accords well with the type series, though the left elytron bears only two dorsal pores of the external series and the prothorax is somewhat broader, whereas the male is somewhat similar to the nominotypical subspecies in the narrower base of the prothorax and the relatively elongate elytra though not so narrow as in the nominotypical subspecies. The standard ratios of their body parts are as follows: PW/HW 1.43 in ♂, 1.41 in ♀, PW/PL 0.95 in ♂, 0.96 in ♀, PW/PA 1.43 in both ♂ and ♀, PW/PB 1.50 in ♂, 1.45 in ♀, PB/PA 0.96 in ♂, 0.99 in ♀ [PA/PB 1.05 in ♂, 1.01 in ♀], EW/PW 1.82 in ♂, 1.87 in ♀, EL/PL 2.66 in ♂, 2.53 in ♀, EL/EW 1.53 in ♂, 1.41 in ♀. The male genitalia are identical with those of the nominotypical subspecies. Unfortunately, the collecting site of these specimens was later destroyed by road works.

***Kusumia amicorum* S. UÉNO, sp. nov.**

(Figs. 22–24)

Length: 5.55–5.80 mm (from apical margin of clypeus to apices of elytra).

Related to *K. yoshikawai* and particularly close to its subsp. *latipennis*, but obviously larger in size and different in the larger hind body with less prominent elytral shoulders.

Colour, pubescence and microsculpture as in *K. yoshikawai*. Head as in the latter species, but a little more elongate and more parallel-sided, with the genae more abruptly contracted towards neck constriction at the posterior parts; antennae reaching the middle of elytra, sometimes extending slightly beyond that level in ♂. Pronotum relatively elongate, widest at about four-sevenths from base, which is fairly wide like that in *K. yoshikawai latipennis*; PW/HW 1.35–1.43 (M 1.39), PW/PL 0.89–0.94 (M 0.92), PW/PA 1.40–1.50 (M 1.45), PW/PB 1.33–1.44 (M 1.39); sides rather strongly arcuate in front, shallowly and widely sinuate behind the middle, and either subparallel to each other or slightly divergent towards hind angles behind ante-basal situation, which is not sharply marked though lying around basal fifth; apex nearly straight and more or less narrower than base, PB/PA 1.03–1.06 (M 1.04) [PA/PB 0.95–0.97 (M

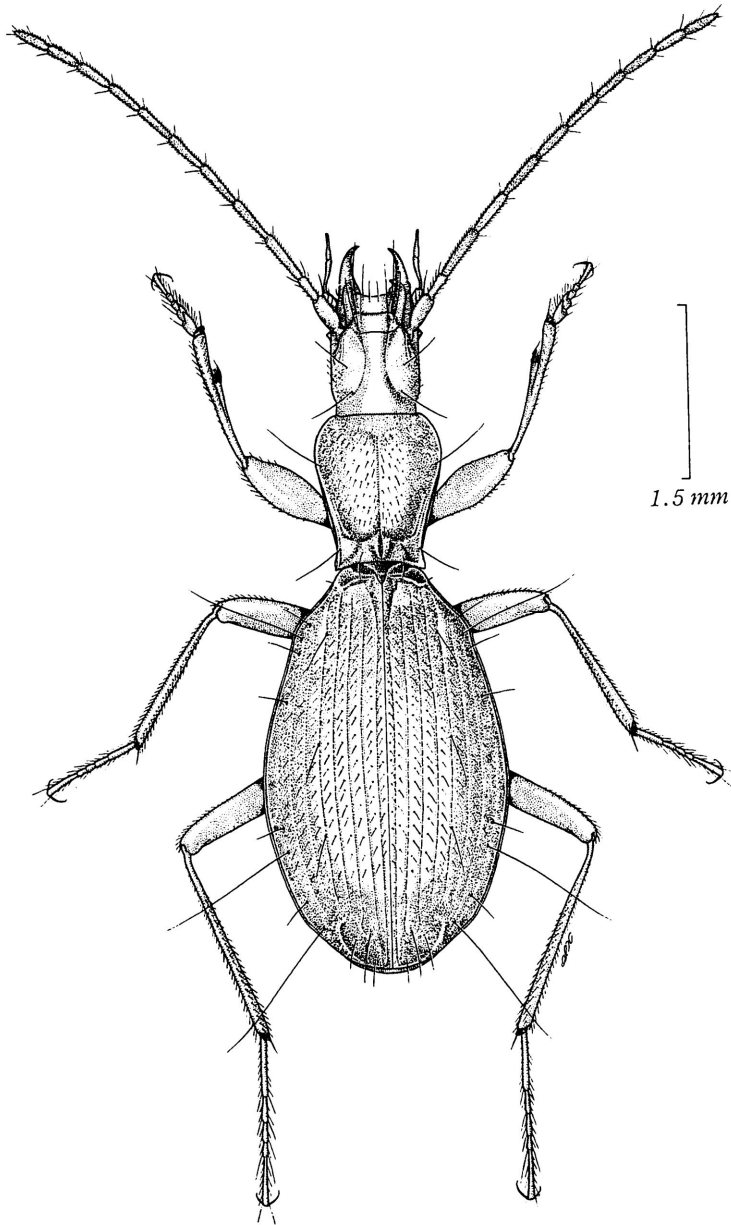
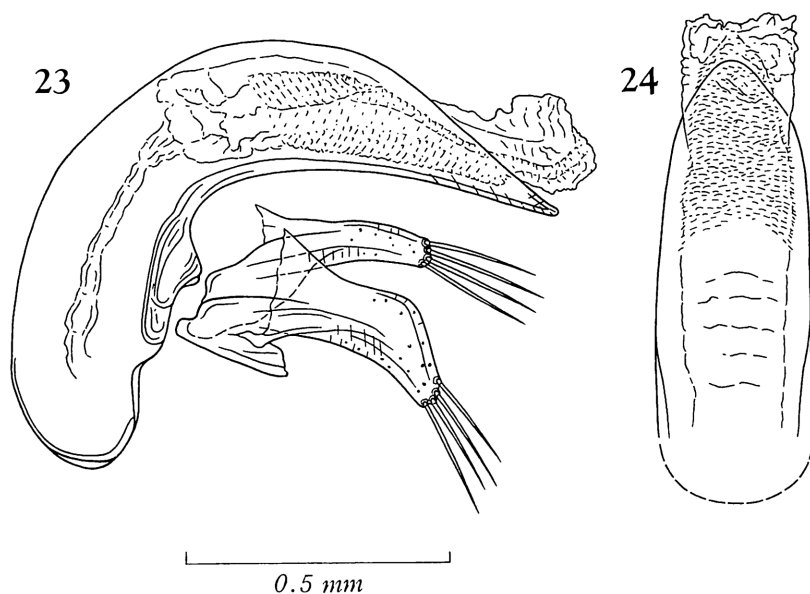


Fig. 22. *Kusumia amicornum* S. UÉNO, sp. nov., ♂, from below Ichinotawa on Mt. Misen.

0.96)]; front angles small and not much produced forwards; base shallowly and widely emarginate, with sharp hind angles produced more posteriorly than laterally; dorsum rather strongly convex in anterior part, pubescent and sculptured as in *K. yoshikawai*.

Elytra oblong-ovate, large and ample, more than a half longer than fore body,



Figs. 23–24. Male genitalia of *Kusumia amicorum* S. UÉNO, sp. nov., from below Ichinotawa on Mt. Misen; left lateral view (23), and apical part of aedeagus, dorso-apical view (24).

widest at about middle, and a little more gradually narrowed towards bases than towards apices, with ample apical part widely and conjointly rounded at the apical margins; EW/PW 1.85–1.95 (M 1.89), EL/PL 2.57–2.72 (M 2.64), EL/EW 1.46–1.55 (M 1.51); shoulders distinct though obtuse; prehumeral borders oblique, nearly straight or slightly outcurved at the anteriormost portions, and glabrous except for a hair lying at each anterior end; sides slightly emarginate just behind humeral angles, then widely and rather strongly arcuate to apices without appreciable preapical emargination; dorsum well convex and steep at the apical declivity, with rather deep basal depression delimited on each side by a very obtuse basal carina formed by the basal portion of interval 5; striae entire, fairly deep on the disc but becoming shallower at the side, striae 1–4 deepened in basal depression; scutellar striole very short; apical striole short but deep, moderately curved, and joining stria 5; intervals slightly convex on the disc, completely flat at the side, each bearing an irregular row of suberect pubescence, which does not extend posteriorly beyond the level of preapical pore; stria 3 devoid of dorsal pore; stria 5 always with three setiferous dorsal pores at 1/7–1/6 (usually 1/7), 1/3–1/2 (usually 2/5) and 4/7–3/4 (usually 2/3) from base, respectively.

Ventral surface rather sparsely pubescent, anterior halves of respective sternites almost bare. Legs long and slender, a little longer than in *K. yoshikawai*; tarsomere 1 about as long as tarsomeres 2–4 together in both meso- and metatarsi; in ♂, protarsomeres 1 and 2 widely dilated and produced inwards at apices.

Male genital organ basically similar to that of *K. yoshikawai*, small but moder-

ately sclerotized, differing from the latter only in configuration. Aedeagus about one-third as long as elytra, strongly arcuate in proximal half but not so strongly as in *K. yoshikawai* and less depressed than in the latter, rather rapidly attenuate towards apex from behind middle in profile, and widely membranous on dorsum, with the dorsal margin strongly and regularly rounded in profile; basal part elongate, distinctly emarginate at the sides of small basal orifice, and provided with a vestigial sagittal aileron; apical lobe broad and very short, broad at the base, abruptly narrowed apicad and rather widely rounded at the tip in dorsal view, narrow and simply attenuate in lateral view; ventral margin slightly but widely emarginate in profile. Inner sac covered with poorly sclerotized minute scales but devoid of differentiated inner armature. Styles fairly large, left style much broader and longer than the right, each bearing four slender setae at the apex.

Type series. Holotype: ♂, allotype: ♀, 28-VI-1998, S. UENO leg. Paratypes: 3 ♂♂, 3 ♀♀, 28-VI-1998, S. UENO & Y. NISHIKAWA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Mt. Misen, below Ichinotawa, 1,320 m in altitude, in Tenkawamura of Nara Prefecture, Central Japan.

Notes. Though obviously larger than *K. yoshikawai*, this new species is a close relative of the latter beyond doubt. This is readily understood from a very close similarity of their aedeagi. The two species should belong to a particular lineage, whose distributional range is restricted to the southern parts of the Daikō and the Ohminé mountains connected by the Oba-ga-miné Ridge. Judging from the aedeagal conformation, above all from the absence of inner armature, it must be closer to the northern lineage (to be called the *takahasii* group) than to the southern ones (the *elongata* and the *tanakai* groups). It is, however, almost always different from the former in the absence of the dorsal pore on the 3rd elytral stria, even though the pore remains on the left elytron of an exceptional specimen of *K. yoshikawai*. A similar exceptional reversion of the setiferous dorsal pore of the internal series has been known only in *K. australis* of the *tanakai* group. For this reason, I consider it appropriate to recognize a particular species-group for this lineage, which will be called the group of *K. yoshikawai* and is characterized by a combination of the following morphological features: variable in both size and facies; prothorax either longer than wide or as long as the latter, with base either narrower than apex or wider than the latter; elytra ovate to elongated ovate, much wider than prothorax, and glabrous at the apical parts, particularly in the field of apical striole; shoulders either prominent and almost tuberculate (*K. yoshikawai*) or less salient (*K. amicum*); prehumeral border glabrous except for a hair at the external edge of basal transverse furrow; elytral stria 3 devoid of setiferous dorsal pore, at least on one elytron; elytral stria 5 with two or three setiferous dorsal pores; aedeagus strongly arcuate in basal half, and devoid of inner armature.

Kusumia amicum was discovered near the eastern end of Mt. Misen, which marks the highest point of the Ohminé Mountains at its western part, Hakken-zan (1,915 m in height). This mountain is largely granitic, so that it is mostly unfavourable

for harbouring anophthalmic beetles. However, a non-granitic gully was located by ASHIDA and his friends at the head of the Kotsubo-dani, one of the upper courses of the Ten-no-kawa River which is one of the main branches of the Kumano-gawa River. It is embraced by a rectangular bend of the watershed ridge of the Ohminé Mountains about 2.5 km south of Mt. Gyôjakaeri-daké, and forms a large muddy non-granitic scree surrounded by a deciduous broadleaved forest at an elevation of 1,320–1,340 m, only 120 m or so below the pass on the watershed called Ichinotawa. Guided by ASHIDA and four other coleopterists, NISHIKAWA and I visited the gully on June 28, 1998, and found that the scree was thick along the bottom of the gully and was fed by several seepages trickling from different directions. The trechine beetle was usually met with near the underground seepages 1.5 m or more below the surface of the muddy scree. It was not very agile when exposed, though not easily caught because of the loose nature of the steep scree.

This new species is named for commemorating the friendly collaboration of the six friends of mine, Yoshiaki NISHIKAWA, Hisashi ASHIDA, Kunihiro KAMADA, Takeshi KITAYAMA, Satoshi NAKAMURA and Takumi SAITO.

Kusumia takahasii (S. UÉNO, 1952)

Ryugadous (Kusumia) takahasii S. UÉNO, 1952, *Mushi*, Fukuoka, **24**, p. 16, pl. 2, fig. 2; type locality: Fudô-no-iwaya Cave at Kashiwagi.

Kusumia takahasii: S. UÉNO, 1953, *Shin Konchû*, Tokyo, **6** (11), p. 45, fig. 2; 1960, *Mem. Coll. Sci. Univ. Kyoto*, (B), **27**, pp. 123, 124, fig. 1; 1985, *Coleopt. Japan Col.*, Osaka, **2**, p. 80, pl. 15, fig. 17. — NAKANE, 1963, *Icon. Ins. Japon. Col. nat. ed.*, **2**, p. 24, pl. 12, fig. 18. — CASALE & LANEYRIE, 1982, *Mém. Biospéol.*, Moulis, **9**, p. 91.

Kusumia Takahasii: JEANNEL, 1962, *Revue fr. Ent.*, **29**, p. 204.

Kusumia takahashii takahashii [sic]: TANAKA, 1993, *Kuroshio*, Gobô, (12), p. 13.

Known so far from only two limestone caves on the opposite sides of the Yoshinogawa River, that is, Fudô-no-iwaya Cave at Kashiwagi (type locality; 330 m in altitude) and Suishô-no-iwaya Cave at Kitawada (450 m in altitude), both in Kawakami-mura of Nara Prefecture.

Notes. *Kusumia takahasii* with its subsp. *tsudai* and *K. yosiiiana* form a species-group of their own for the following reasons: variable in size; prothorax elongate, always longer than wide, and contracted at base, which is either narrower than apex or about as wide as the latter; elytra broad and well convex, much wider than prothorax, and glabrous at the apical parts, particularly behind the level of preapical pore; shoulders either effaced (*K. takahasii*) or prominent and tuberculate (*K. yosiiiana*), with each prehumeral border glabrous except for a hair at the external edge of basal transverse furrow; elytral stria 3 always with a setiferous dorsal pore near base; elytral stria 5 usually with three setiferous dorsal pores, exceptionally with two or four dorsal pores on one elytron; aedeagus inerm, more or less strongly arcuate.

It is probable that the members of the *takahasii* group are most highly adapted to subterranean existence of all the known species of the genus *Kusumia* with the excep-

tion of *K. longicollis* to be described on later pages. However, they retain a primitive condition of aedeagal conformation, since neither sclerotized scales nor copulatory pieces have yet developed in the inner sac, a condition that is rather exceptional for members of the derived genera of the group of *Trechiamia*.

***Kusumia takahasii tsudai* S. UÉNO, 1960**

Kusumia takahasii tsudai S. UÉNO, 1960, Mem. Coll. Sci. Univ. Kyoto, (B), **27**, pp. 123, 127, fig. 2; type locality: Menfudô-no-iwaya Cave at Dorogawa. — CASALE & LANEYRIE, 1982, Mém. Biospéol., Moulis, **9**, p. 91.

Kusumia Takahasii Tsudai: JEANNEL, 1962, Revue fr. Ent., **29**, p. 204.

Kusumia t. tsudai: TANAKA, 1993, Kuroshio, Gobô, (12), p. 13.

This subspecies has been known from four limestone caves at Dorogawa, that is, Menfudô-no-iwaya Cave (type locality; 910 m in altitude), Shinsen-dô Cave and Kômori-no-iwaya Cave (both 870 m in altitude), and Goyomatsu-daini-dô Cave (910 m in altitude). They are distributed along the right side of the Sanjô-gawa, one of the upper courses of the Ten-no-kawa River, with the exception of the last-named which lies on the left side. The distance between the first and the last is only 1.8 km in a bee-line.

Additional records. 2 ♂♂ (1 teneral), 2 ♀♀, Shinsen-dô Cave, Dorogawa, Tenkawa-mura, Nara Pref., 11-X-1968, K. MIZUSHIMA leg.; 1 ♂, same cave, 4-II-1979, K. MIZUSHIMA leg.; 1 ♂, 1 ♀ (teneral), Goyomatsu-daini-dô Cave, Dorogawa, Tenkawa-mura, Nara Pref., 11-X-1968, K. MIZUSHIMA leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Notes. It is strange that the Dorogawa populations of *Kusumia*, isolated from the Kawakami-mura populations of *K. takahasii* by a distance of more than 10 km beyond the main watershed ridge of the Ohminé Mountains, can be distinguished from the latter as rather a subtly characterized subspecies, although the northernmost population of the genus in Kawakami-mura, the habitat of which is only 1.1 km distant from the northern known locality of the nominotypical subspecies of *K. takahasii*, belongs to a distinctive species, *K. yosiiiana*. How such an unusual differentiation has taken place is difficult to elucidate at present, particularly under the situation that no apparent barrier against their dispersal has been recognized between the localities of the latter two. It is possible that surface topography and underground water system may have been different in the past from those of the present day and that the ancestor of *K. yosiiiana* may have been isolated from those of the others by certain impassable barrier.

***Kusumia yosiiiana* S. UÉNO, 1960**

Kusumia yosiiiana S. UÉNO, 1953, Shin Konchû, Tokyo, **6** (11), p. 45 [nom. nud.].

Kusumia yosiiiana S. UÉNO, 1960, Mem. Coll. Sci. Univ. Kyoto, (B), **27**, pp. 124, 128, fig. 3; type locality: Tennin-no-iwaya Cave at Shirakawado. — CASALE & LANEYRIE, 1982, Mém. Biospéol., Moulis, **9**, p. 91, fig. 58 right.

Kusumia Yosii [sic]: JEANNEL, 1962, Revue fr. Ent., **29**, p. 205.

Kusumia yoshiitana [sic]: TANAKA, 1993, Kuroshio, Gobô, (12), p. 13.

Only known from a pair of the type specimens collected in the spring of 1952. The type locality was visited many times after that, but did not yield any additional material probably because of unfavourable condition in the small cave. Besides, the entrance section was recently modified by the enlargement of the Route 169, which may have adversely affected the climate of the interior.

***Kusumia longicollis* S. UÉNO, sp. nov.**

(Fig. 25)

Kusumia sp. J: TANAKA, 1993, Kuroshio, Gobô, (12), p. 14.

Length: 4.75 mm (from apical margin of clypeus to apices of elytra).

A remarkable small species recognized at first sight on its narrow prothorax, short broad elytra with tuberculate humeral angles, and a combination of glabrous pre-humeral borders and pubescent apical area in the field of apical striole.

Facies unique, with unusually narrow fore body and broad convex hind body; apterous and depigmented; surface pubescent on both dorsum and venter. Colour reddish brown with darker elytra, shiny, hardly iridescent; palpi, scape and apical halves of antennae, legs, epipleura and abdominal sternites brown to light reddish brown, more or less lighter than the other parts of body.

Head subquadrate, a little longer than wide, and depressed above; frontal furrows deeply impressed and gently arcuate in front, not angulate at middle, and becoming shallower and widely divergent towards neck constriction, which is shallow and not sharply marked; frons longitudinally convex, supraorbital areas gently so, the latter bearing two pair of supraorbital pores on lines convergent posteriorly; microsculpture sharply impressed, mostly consisting of wide reticulation; genae only feebly convex, a little more so at the posterior parts, and rather extensively pubescent; neck very wide, about nine-tenths as wide as the widest part; labrum transverse, widely emarginate at the apex; mandibles fairly slender, moderately arcuate at the apical parts and acute at the apices; mentum with an exceptionally short and broad tooth in apical emargination, which is simply subtriangular; palpi slender; antennae relatively stout, reaching basal four-sevenths of elytra, segment 2 the shortest, about a half as long as segment 3, which is slightly longer than 4, segments 4–10 gradually decreasing in length towards apex, each subcylindrical, 6 a little less than 4.5 times as long as wide, terminal segment about as long as 6, obviously longer but narrower than scape.

Pronotum exceptionally narrow for a member of *Kusumia*, elongate, wider than head, widest at three-fourths from base, and more gradually narrowed towards base than towards apex, though not much contracted at the two ends; PW/HW 1.33, PW/PL 0.90 [PL/PW 1.11], PW/PA 1.33, PW/PB 1.40; sides narrowly bordered throughout, rather feebly arcuate in front, nearly straight at middle, shallowly and widely sinuate

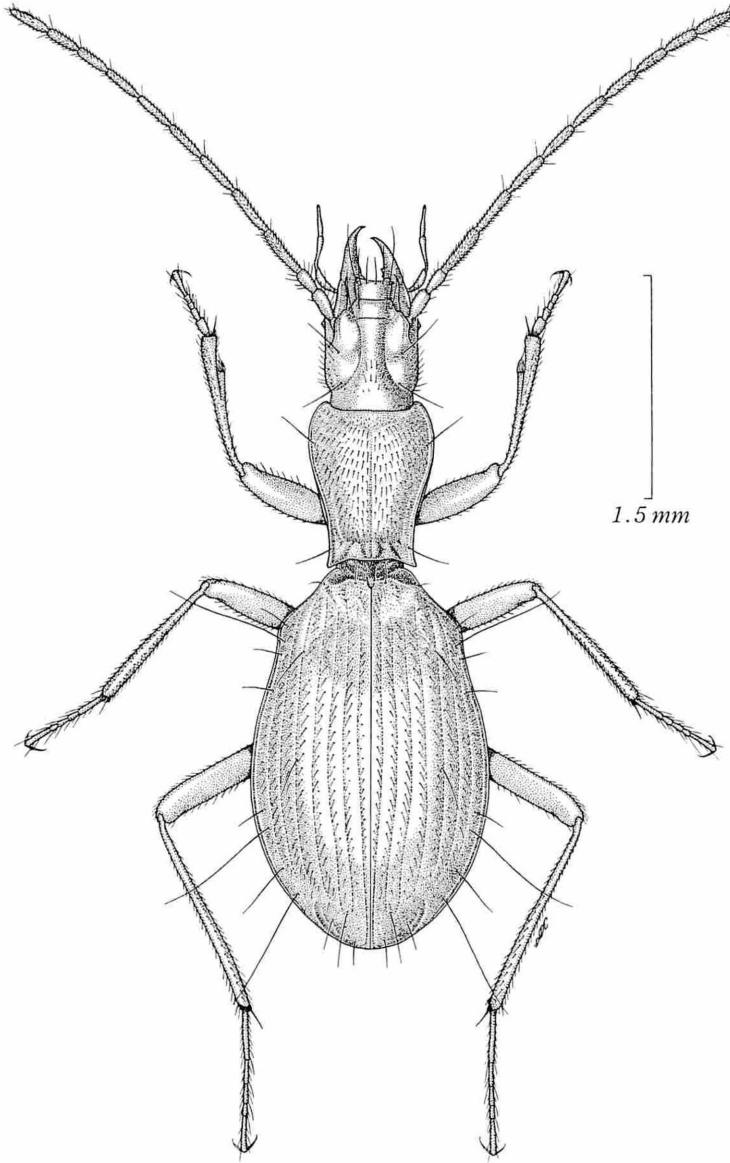


Fig. 25. *Kusumia longicollis* S. UÉNO, sp. nov., ♀, from Okusenjô on the Obako Mountains.

around basal fourth, and then slightly divergent towards sharp hind angles, which protrude more posteriorly than laterally; ante-basal sinuation gradual and not sharply marked; apex nearly straight and wider than base, PB/PA 0.95 [PA/PB 1.06], the latter nearly straight at middle; front angles small though distinctly advanced; dorsum moderately convex in anterior half and densely covered with suberect pubescence; micro-

sculpture consisting of fine transverse lines, mostly distinct though partially obliterated; median line deeply impressed, somewhat widened in basal area; apical transverse impression vague though uneven; basal transverse impression continuous, with a longitudinal foveole on each side and laterally merging into basal fovea, which is small but sharply marked by a deep oblique furrow at the bottom; postangular carinae short and very obtuse; basal area narrow and smooth. Lateral expansion of propleura narrowly visible from above.

Elytra large and broad, ovate, much wider than prothorax, widest at about five-ninths from bases, and almost equally narrowed in front and behind, with ample apical part, whose apical margins are widely and conjointly rounded; EW/PW 1.87, EL/PL 2.48, EL/EW 1.47; shoulders prominent and tuberculate, with prehumeral borders moderately oblique, very slightly outcurved, and glabrous except for a hair lying at the anterior end; sides narrowly bordered throughout, slightly but distinctly emarginate just behind humeral angles, and then rather strongly arcuate to apices without distinct preapical emargination; dorsum well convex though somewhat depressed on the disc, with a deep round depression in the basal area, which is delimited by a prominent basal carina formed by the basal portion of interval 6; apical declivity moderately steep; microsculpture formed by irregularly transverse lines perceptible in most parts; striae superficial though nearly entire, indistinctly crenulate, and becoming shallower at the side, 1–5 more or less deepened in basal depression, 6 evanescent on basal carina; scutellar striole shallow; apical striole short but distinct, gently curved, and directed to stria 5; intervals flat, each bearing an irregular row of relatively short suberect pubescence, which extends to apex through the field of apical striole; apical carina obtuse; stria 3 devoid of dorsal pore; preapical pore situated at the apical anastomosis of striae 2 and 3 a little behind the level of the terminus of apical striole, and more distant from apex than from suture; stria 5 with two setiferous dorsal pores at 1/6 and 4/9 from base, respectively.

Ventral surface extensively pubescent. Legs slender though not particularly long; protibiae straight and moderately dilated towards apices; tarsi fairly thin, tarsomere 1 shorter than tarsomeres 2–4 together in both meso- and metatarsi.

Male unknown.

Type specimen. Holotype: ♀, 22–VIII–1988, S. TANAKA leg. Deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Okusenjô, 1,110 m in altitude, above the Ohno-dani in Totsukawa-mura of Nara Prefecture, Central Japan.

Notes. This is an isolated species whose true affinity is not certain. In many respects, it resembles the members of the *takahasii* group, but is evidently different in the unusually narrow prothorax, the absence of setiferous dorsal pore on the 3rd elytral stria and of the third dorsal pore on the 5th, and the pubescent apical area of the elytra. Since males are unknown, I tentatively recognize a species-group of its own for this new species, leaving the final decision for future investigations.

This species-group, to be called the *longicollis* group, is characterized by a combination of the following character states: small species with narrow elongate fore body and short broad elytra; prothorax much longer than wide, and not much contracted at both apex and base; elytra ovate and convex, much wider than prothorax, and wholly pubescent; shoulders prominent and distinctly tuberculate, with each prehumeral border glabrous except for a hair at the external edge of basal transverse furrow; elytral stria 3 without setiferous dorsal pore; elytral stria 5 with two setiferous dorsal pores.

The single known specimen of *K. longicollis* was dug out from a small colluvium at the side of a trail crossing the head gullies of the Ohno-dani, one of the upper courses of the Kanno-gawa, a northwestern tributary of the Kumano-gawa River. The collecting site is only 100 m below the watershed ridge of the Obako Mountains, 2.9 km southeast of the summit of Mt. Gomadan-zan, about 9 km distant to the east-northeast from the Hirano-dani, the type locality of *K. latior* belonging to the *tanakai* group, about 35 km distant to the west-southwest from Ichinotawa on Mt. Misen, the type locality of *K. amicorum* belonging to the *yoshikawai* group, and about 36 km distant to the southwest from Menfudô-no-iwaya Cave, the type locality of *K. takahasii tsudai* belonging to the *takahasii* group. Though not so far from the Hirano-dani, the Obako Mountains stretch on the other side of the Hidaka-gawa Valley, and from the Ohminé Mountains on which lie the latter two localities, the Obakos are separated by the main course of the Totsu-gawa, the western branch of the Kumano-gawa River.

The collecting site of the type specimen seems to have been fed by a trickle before the slope was deforested, but is now completely dried up except on rainy days. It is a miracle that an anophthalmic trechine can survive in such a small dried colluvium. I visited the place on October 7, 1989, with Yoshiaki NISHIKAWA and Akiko SAITO, only finding the miserable condition of the habitat and its surroundings. Since any *Kusumia* has not been known from other places on the Obako Mountains in spite of repeated searches made by TANAKA and other collectors, it may not be easy to find out close relatives of *K. longicollis*, which may be useful for determining the true systematic status of the *longicollis* group even if *K. longicollis* itself becomes a lost species.

要 約

上野俊一：キイメクラチビゴミムシ属の盲目甲虫類。——キイメクラチビゴミムシ属は、紀伊半島の紀ノ川以南の地域に分布する比較的、大型のメクラチビゴミムシ類で構成され、これまでに24カ所から11種2亜種が知られている。もともとは、属の分布域の北東部にある石灰洞で発見されたものだが、その近隣地域の石灰洞7カ所のほかに、廃坑3カ所と、14カ所の地下浅層からも見つかっているので、本来は地下浅層性のものだろうと考えられる。このうち、すでに命名公表されているのは3種1亜種にすぎず、残りは未記載のまま残されてきた。多くの種が希少であるために十分な資料をうるのが容易でなく、とくに雄の標本の採りにくかったことが、正式な記載の遅れた最大の原因である。しかし、林道の建設や廃坑の破壊のために、いくつかの未記載種の生息場所は失われたり、われわれの手が届かないところへ行ってしまう

た。いっぽう、自然保護の観点からも、これまでに集積された知見を公表しておくことが必要になった。それで、既知の全個体群を検討して、その結果をこの論文にまとめた。まだ未解決の問題もいくつか残されているが、いちおうの結論は下記ようになる。

1. クマノメクラチビゴミムシ群

クマノメクラチビゴミムシ *Kusumia elongata* S. UÉNO (和歌山県熊野川町谷口, 紀州鉾山下子谷坑)

ロッカメクラチビゴミムシ *Kusumia dentata* S. UÉNO (和歌山県熊野川町上長井小口, 六貫谷鉾山下ノ追坑)

オウトウメクラチビゴミムシ *Kusumia laticollis* S. UÉNO (和歌山県本宮町野竹法師 黒蔵谷)

2. タナカメクラチビゴミムシ群

タナカメクラチビゴミムシ *Kusumia tanakai* S. UÉNO (和歌山県白浜町庄川郷地谷 七滝, 滝谷; 同 日置川町久木 小谷峠; 同 日置川町川原谷 卒塔婆峠; 同 大塔村鮎川, 下平試掘坑)

リュウジンメクラチビゴミムシ *Kusumia latior* S. UÉNO (和歌山県龍神村平野 平野谷)

コカシメクラチビゴミムシ *Kusumia australis* S. UÉNO (和歌山県すさみ町江住 コカシ峠)

3. ヨシカワメクラチビゴミムシ群

ヨシカワメクラチビゴミムシ *Kusumia yoshikawai yoshikawai* S. UÉNO (奈良県上北山村/三重県宮川村 大台ヶ原山)

オバミネメクラチビゴミムシ *Kusumia yoshikawai latipennis* S. UÉNO (奈良県上北山村和佐又口および伯母峰峠)

ミセンメクラチビゴミムシ *Kusumia amicornum* S. UÉNO (奈良県天川村弥山 一ノ埴下)

4. フドウノメクラチビゴミムシ群

フドウノメクラチビゴミムシ *Kusumia takahasii takahasii* (S. UÉNO) (奈良県川上村柏木, 不動窟; 同 川上村北和田, 水晶窟)

ドロガワメクラチビゴミムシ *Kusumia takahasii tsudai* S. UÉNO (奈良県天川村洞川, 面不動窟, 蝙蝠窟, 神泉洞, 五代松第二洞)

テンニンノメクラチビゴミムシ *Kusumia yosiana* S. UÉNO (奈良県川上村白川渡, 天人窟)

5. ゴマダンメクラチビゴミムシ群

ゴマダンメクラチビゴミムシ *Kusumia longicollis* S. UÉNO (奈良県十津川村奥千丈)

上記の5種群のうち、クマノメクラチビゴミムシ群とタナカメクラチビゴミムシ群、ヨシカワメクラチビゴミムシ群とフドウノメクラチビゴミムシ群は、それぞれ類縁に近い。前者は属の分布域の南西部に拡がり、和歌山県の龍神村が既知の北限になっている。上翅の肩縁部に細毛列をもち、間室の細毛列が亜端毛の後方まで延び、第3条には2個の剛毛孔点しかなく、また、雄交尾器の内袋にいちじるしく発達した交尾片や歯群をそなえている。これに対して、後者は属の分布域の北東部に偏在している。上翅の肩縁部には最前部の細毛1本のみが残り、間室の細毛列が亜端溝で囲まれる範囲に延びず、第3条にはふつう3個の剛毛孔点をそなえ、雄交尾器の内袋に分化した交尾片や歯群がない。両者のあいだには明瞭な断絶があって、明らかに中間的な特徴をもつ種類は今のところ見つかっていないが、図1に示したように、十津川流

域にはまだ大きい空白が残されているので、将来この地域から両主種群を橋渡しするような新種が発見されるかも知れない。

クマノメクラチビゴミムシ群とタナカメクラチビゴミムシ群とがごく近い関係にあることは、前群に属するオウトウメクラチビゴミムシと、後群に属するコカシメクラチビゴミムシとが、きわめてよく似た雄交尾器をもつことから容易に推察できる。ヨシカワメクラチビゴミムシ群とフドウノメクラチビゴミムシ群との関係はおそらくより密接で、ヨシカワメクラチビゴミムシの検視標本のうちに、体の半分だけフドウノメクラチビゴミムシ群の特徴（剛毛式）をそなえた1個体が見つかっている。

興味深いのはゴマダンメクラチビゴミムシ群である。この種群は、今のところゴマダンメクラチビゴミムシただ1種で構成され、しかも雄が未知であるために類縁関係がよくわからない。全体としてはフドウノメクラチビゴミムシ群の種に似ている点が多いが、上翅の第3条に剛毛孔点がなく、第5条の第3孔点を欠き、間室の細毛列が亜端毛の位置を越えて翅端部まで延びている点では、タナカメクラチビゴミムシ群と共通している。また、前胸部が異常に細長く、体の後半部は短くて幅が広い。この種が、南北ふたつの主種群の中間に位置するものだと即断するわけにはいかないが、その可能性を暗示するものであることは確かだろう。

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