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Revision of the Seashore-dwelling Subgenera *Emplenota* Casey and *Triochara* Bernhauer (Coleoptera: Staphylinidae: genus *Aleochara*) from Japan

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Abstract

The Japanese species of the seashore-dwelling subgenera *Emplenota* Casey and *Triochara* Bernhauer of the genus *Aleochara* Gravenhorst are revised. Five species are recognised in *Emplenota*, of which three are described as new species: *Aleochara* (*Emplenota*) *segregata* n. sp., *A.* (*E.*) *hayamai* n. sp. and *A.* (*E.*) *yamato* n. sp. The remaining known species *A.* (*E.*) *fucicola* Sharp and *A.* (*E.*) *puetzi* (Assing) are redescribed. Three species recognised in *Triochara*, *Aleochara* (*Triochara*) *trisulcata* Weise, *A.* (*T.*) *zerchei* (Assing) and *A.* (*T.*) *nubis* (Assing) are redescribed. All species are keyed. For some species ecological data are reported. The phylogenetic relationships of the Japanese species are discussed, and the distributions of all species are mapped.

Key words: biodiversity, coastal environment, identification key, Palaearctic, redescription, supratidal zones, sympatric species, taxonomy

Introduction

Recent studies have revealed the worldwide coastal staphylinid diversity (Moore & Legner, 1976; Hammond, 2000; Frank & Ahn, 2011), and the subfamily Aleocharinae is represented by 187 species throughout the world, representing the largest number of coastal staphylinid beetles (Frank & Ahn, 2011). The genus *Aleochara* Gravenhorst, 1802 is represented by 16 coastal species belonging to four subgenera (Frank & Ahn, 2011).

Aleochara comprises more than 450 species, and is distributed worldwide, except for Antarctica (e.g., Bernhauer & Scheerpeltz, 1926; Klimaszewski, 1984; Maus *et al*., 2001). Most species are found near fly-infested habitats such as carrion, animal droppings, or decaying plant material. Most *Aleochara* species are characterised by unusual life histories, i. e., the parasitoid larvae use cyclorrhapheous fly puparia as hosts. Thus, they act as important natural enemies of many dipteran species (e.g., Klimaszewski, 1984; Klimaszewski & Jansen, 1993; Maus *et al*., 2001). Because of their importance in biological control, quite a few studies have been conducted on some species to clarify their biology (Maus *et al*., 2001). There are, however, several issues still remaining to be solved with regard to the taxonomy, systematics, phylogeny and life history of *Aleochara*. Numerous unpublished synonyms, lack of adequate keys for specific identification, use of superficial, and often useless, external characteristics, and a lack of pictures or illustrations pose major difficulties (Klimaszewski, 1984). Recent studies clarified the fauna of East Asian *Aleochara* partially such as the subgenus *Xenochara* Mulsant & Rey, 1874 in South Korea (Park & Ahn, 2010), the subgenus *Aleochara* Gravenhorst, 1802 in mainland China (Luo & Zhou, 2012), and some littoral subgenera (Assing, 1995; Ahn *et al*., 2000; Park & Ahn, 2004). In spite of these efforts, the current situation is still far from adequately worked out in Asia. Knowledge of the Japanese *Aleochara* fauna is also incomplete; to date, only 22 species have been recorded (Smetana, 2004; Yamamoto & Maruyama, 2009). Furthermore, many problems remain in the taxonomy of the Japanese *Aleochara*, such as doubtful interpretation of most species due to the absence of modern revisions of type material.

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The subgenera of *Emplenota* Casey, 1884 and *Triochara* Bernhauer, 1901 are known as seashore-dwelling taxa that inhabit decaying seaweed, debris, under driftwood, and sometimes carrion on beaches (e. g., Klimaszewski, 1984; Frank & Ahn, 2011). Their larvae are ectoparasitoids of the pupae of dipteran species (Peschke & Fuldner, 1977; Klimaszewski, 1984; Assing, 1995; Yamazaki, 2008, 2012), as are members of the other subgenera of *Aleochara*. The subgenera addressed here are considered as sister groups, based on morphological and molecular evidence (Assing, 1995; Maus *et al*., 1998a, 2001), and they share a unique character state: a pair of subapico-ventral projections on the median lobe of the male aedeagus (Assing, 1995). *Emplenota* and *Triochara* have occasionally been treated as distinct genera (e. g., Seevers, 1978; Lohse, 1984, 1985, 1989; Assing, 1995), but recent studies have confirmed that these genera are phylogenetically nested within the genus *Aleochara* (Maus *et al*., 2001).

The subgenus *Emplenota* includes eight species from Europe, North Africa, East Asia, and North America on both the Atlantic and Pacific coasts (Klimaszewski, 1984; Assing, 1995; Maus & Ashe, 1998a; Smetana, 2004; Frank &Ahn, 2011). All of the three known species of *Triochara* are, on the other hand, restricted to the Pacific coast of East Asian countries, namely, Russia (Far East), Japan, South Korea, North Korea, and Hong Kong (Assing, 1995; Maus & Ashe, 1998c; Ahn *et al*., 2000; de Rougemont, 2001; Paśnik, 2001; Maruyama, 2002; Park & Ahn, 2004; Smetana, 2004; Frank & Ahn, 2011). Taxonomic and faunal information on both subgenera has been gradually accumulating.

Study of the Japanese staphylinid fauna began with a series of papers by Sharp in the late 19th century, and the first Japanese *Emplenota* species, *A.* (*E.*) *fucicola*, was described as *Aleochara fucicola* from "Amakusa and Iwosima, near Nagasaki" (Amakusa-shi, Kumamoto-ken (or Iô-jima, Nagasaki-shi, Nagasaki-ken), Kyûshû) (Sharp, 1874). In the same decade, Weise (1877) described two species, *Aleochara trisulcata* and *A. variolosa* (as genus *Homalota* Mannerheim, 1830), both from "Hagi" (Hagi-shi, Yamaguchi-ken, western end of Honshû). Bernhauer (1901b) established the subgenus *Triochara* for *A. trisulcata*. Later, Fenyes (1920) recognised additional five species from Australia in *Triochara*, but Bernhauer & Scheerpeltz (1926) subsequently excluded these five species. As a result, only *A. trisulcata* was confirmed in the subgenus at that time. On the other hand, *A. fucicola* was placed in the subgenus *Emplenota* in Bernhauer and Scheerpeltz (1926). Sawada (1971) redescribed *A.* (*T.*) *trisulcata* and *A.* (*E.*) *fucicola* with emphasis on the character states of mouth parts. The Palaearctic species of *Emplenota* and *Triochara* were revised by Assing (1995) (as distinct genera), and three additional species were described from the Russian Far East, namely *A.* (*E.*) *puetzi*, *A.* (*T.*) *zerchei*, and *A.* (*T.*) *nubis*, which were later recorded from Japan (Maruyama, 2002). Assing (1995) regarded *Homalota variolosa* as a synonym of *A.* (*E.*) *fucicola*. Recently, Ahn *et al*. (2000) and Park and Ahn (2004) published records of *Emplenota* and *Triochara* from South Korea.

In the present study, we clarify the Japanese fauna of *Emplenota* and *Triochara* in the first revisionary contribution to the Japanese species of *Aleochara*. We examined more than two thousands of specimens, which were collected from all over Japan and adjacent regions, so that the results provide us with more reliable faunistic information on the subgenera. In view of the ongoing destruction of the coastal and seashore environments of Japan, it is crucial to comprehensively investigate the fauna in these areas. Identification of *Emplenota* and *Triochara* is difficult even for skilled taxonomists. Hence, we also establish an easier identification method. The species of *Emplenota* and *Triochara* are extremely similar in general appearance even in the genital structures. Therefore, an easy-to-use key allowing an accurate identification of the species is provided.

Materials and methods

Material from institutions and private collections

Most specimens used were supplied from institutional or personal collections. In addition, we collected other materials. The depositories of the material examined are abbreviated as follows (all collections, excluding the Natural History Museum, London, and the Field Museum of Natural History, Chicago, are in Japan):

Institutions:

BMNH	The Natural History Museum, London (R. Booth).
CBM	The Natural History Museum and Institute, Chiba (A. Saitô).

EEEU	Laboratory of Environmental Entomology, Ehime University, Matsuyama (H. Yoshitomi).
FMNH	The Field Museum of Natural History, Chicago (M. K. Thayer).
HUM	The Hokkaido University Museum, Sapporo (M. Ôhara).
KUM	The Kyushu University Museum, Fukuoka (M. Maruyama).
SCM	The Sagamihara City Museum, Kanagawa (H. Moriya).

Private Collections:

cHayam	Takeshi Hayama (Okinawa-ken).
cHayas	Yasuhiko Hayashi (Hyôgo-ken).
cItô	Tateo Itô (Kyôto-fu).
cKaw	Yasuko Kawakami (Ôsaka-fu).
cMar	Munetoshi Maruyama (Fukuoka-ken).
cOno	Hiroki Ono (Chiba-ken).
cWat	Takashi Watanabe (Kanagawa-ken).
cYam	Shûhei Yamamoto (Fukuoka-ken).

Most of the type series including holotypes are deposited in the collection of KUM. Some paratypes of the new species to be described in this paper and identified specimens will be distributed to the collections above.

We did not examined the type specimens of the species described by Weise (1877) because they were recently revised by Assing (1995).

Collecting methods

The subgenera *Emplenota* and *Triochara* inhabit nearly the same environment, the supratidal zones of sandy or pebbly beaches, and salt marshes. Specimens were usually hand-picked or aspirated from the sifted material of decaying seaweed. Collected beetles were transferred to a tube with a piece of cotton paper and a small amount of ethyl acetate. Some specimens were preserved in a small tube filled with ethanol.

Dissecting, drawing and editing images

The technical procedures used were generally as described by Maruyama (2006), with some differences. First, the specimens were softened with a small amount of water to detach abdominal terminalia, then soaked in potassium chloride (KOH) solution, both conducted at room temperature (about 20–25°C). Second, the soaking times for each method differed (15–30 min of water softening for the entire body; 1 day in KOH for the removed parts; cleaning in 80% ethanol for 10 min; dehydration in 99% ethanol for 10 min). Holotypes were dissected and mounted with Euparal, following Maruyama (2004b).

A light microscope (Olympus BH-2, Olympus, Tôkyô, JAPAN, with a drawing device) was used for observation and drawing of body parts. Also, a high magnification stereomicroscope (Nikon SMZ 1500, Nikon, Tôkyô, Japan, with light device) was used for observation of general appearance.

Pictures of specimens were taken using a digital camera (Canon EOS 7D, Canon, Tôkyô, JAPAN) with an extreme macro lens (Canon MP-E 65 mm F2.8 1–5×, Canon) and a macro flash (Macro Twin Lite MT-24EX Flash, Canon). Then, focus stacking was conducted using the automontage software Combine ZM (Alan Hadley, UK, http://www.hadleyweb.pwp.blueyonder.co.uk/). All digital images were edited using Adobe Photoshop Elements 6.0 (Adobe, San Jose, CA, USA).

Terminology and abbreviations

The terminology of the morphology used in this study largely follows: Blackwelder (1936), Sawada (1972), Klimaszewski (1984), Thayer (2005), and Maruyama (2006). The terminology for the genitalia used by Welch (1997) was adopted. A few male genitalia terms were adopted from Klimaszewski (1984). The number of setae and pores in the descriptions were confined to one side of the body, except for the macro setae and sensory setae of abdominal parts and for the medial pseudopores on the labium.

All measurements in the text are maximum length and given in millimetres, as minimum length–maximum length (mean ± SD).

The following abbreviations are used: AL, antenna length; BL, body length (approximate whole length); EL, length of elytra from end of posterior margin of pronotum to elytral hind margin; EW, elytral width; FBL, fore body length, from apex of clypeus to the posterior margin of elytra; HL, head length, from apex of postclypeus to

the posterior margin of head capsule, except for membranous anteclypeus and preocciput; HTL, hindtibial length; HW, head width; PL, pronotal length; and PW, pronotal width. Genital parts are abbreviated as follows: ai, apical invagination of spermatheca; bs, basal swelling of median lobe; sa, apical portion of spermathecal stem; sb, basal portion of spermathecal stem; sh, head of spermatheca; sm, membranous portion of spermathecal duct; sn, neck of spermatheca; and ss, sclerotised portion of spermathecal stem (after Welch, 1997, except for (sc): we used (ss) instead of (sc) for the same term; see, Figs. 18, 22).

Other information

The locations recorded in this paper were adopted from the latest version of the World Geodetic System (WGS 84). Some specimens have little information on the collection site. In this case, both latitude and longitude were estimated. We marked the estimated localities with an asterisk, and roughly point them out on maps of beaches (Figs. 101–105). Some specimens with data label of longitude and latitude data were converted into decimal degrees.

The specimen data used in this study largely did not follow the original spellings and place names written on specimen labels. We corrected for more precise and detailed information, except for some old and historically important material. The original spellings on the label attached to the specimen were adopted in such cases.

Japanese place names generally follow the same spelling used in Japan except for some English nouns. Words are nearly corresponded as follows: -chôme (city block of irregular size); -chô, -machi (town); -ku (ward); -shi (city); -gun (county); -to, -fu, -ken (prefecture); -gawa, -kawa (river, stream); -jima, -shima, -Ôshima, -tô (island); -kaigan, -hama (seashore beach); -shotô (islands, archipelago); -misaki, -zaki (cape); -numa (marsh).

Collecting methods and conditions of specimen labels are abbreviated as follows: FIT, flight interception trap; YPT, yellow pan trap. Other abbreviations: BRL, blue round label pinned by a curator; HW, hand written; PRL, purple round label pinned by a curator; RRL, red round label pinned by a curator; YRLS, yellow round label by Dr. David Sharp.

Taxonomy of the rove beetles

Tribe Aleocharini Fleming, 1821

Aleocharidae Fleming, 1821: 49 (type genus: *Aleochara* Gravenhorst, 1802)

Subtribe Aleocharina Fleming, 1821

Aleocharidae Fleming, 1821: 49 (type genus: *Aleochara* Gravenhorst, 1802)
Piochardiae Fenyes, 1918: 20 (type genus: *Piochardia* Heyden, 1870)

Diagnosis. The subtribe is distinguished by the following characteristics: 5-5-5 tarsal formula (4-5-5 in *Tinotus* Sharp, 1833) (Hanley, 2002; Klimaszewski *et al*., 2002); maxillary palpus 4-segmented, plus apical pseudosegment (looks 5-segmented); labial palpus 3-segmented, plus apical pseudosegment (looks 4-segmented); ligula bilobed apically, shorter than the segment I of the labial palpus; lateral projections of labial apodeme elongated (Maruyama, 2004); median lobe of the aedeagus without dorsal apodeme (Maruyama, 2004); at least some species have a reticulated velum on the paramerite of the male aedeagus (Seevers, 1978; Ashe & Maus, 1998).

Comments. This subtribe is composed of 21 genera and is distributed throughout all zoogeographic regions. The subtribe Aleocharina is easily distinguished from the other two subtribes comprised of termitophiles, namely Compactopediina Kistner, 1970, and Hodoxenina Kistner, 1970, in the tribe Aleocharini, by a rather generalized body shape (with some exceptions). Recently, however, a myrmecoid genus of the subtribe Aleocharina, *Myrmecostica* Maruyama, 2011, was described from Borneo (Maruyama *et al*., 2011).

The phylogenetic relationships within the subtribe remain uncertain. The phylogenetic concept of this subtribe is very unstable due to uncertain limits of the genus *Aleochara* and related taxa (Ashe & Maus, 1998). The monophyly of Aleocharina is still not established (Ashe & Maus, 1998), and no autapomorphy has been detected for it. Kanao *et al*. (2011) showed that Compactopediina belongs to the *Tetrasticta* Kraatz, 1857 genus group of Aleocharina (sensu Maruyama, 2004a) and suggested non-monophyly of Aleocharina.

In Japan, 5 genera, 6 subgenera (all subgenera belong to *Aleochara*), and 27 species of this subtribe have hitherto been recorded.

Genus *Aleochara* Gravenhorst, 1802

Aleochara Gravenhorst, 1802: 67 (original description; type species: *Staphylinus curtulus* Goeze, 1777).

See, Klimaszewski (1984), Smetana (2004) and Gouix & Klimaszewski (2007) for further synonymic information.

Redescription. Body: small to large, medium to large in many cases; overall shape diverse, normally more or less broad: compact and robust, more or less fusiform or cylindrical and rarely slender and narrow (Ashe & Maus, 1998). **Colour**: uniformly reddish brown to black in most cases, sometimes elytra lighter or with maculations. **Head**: head capsule somewhat circular to more or less transverse. **Antennae**: 11-segmented, scape somewhat clavated, normally longer or as long as pedicel (Klimaszewski, 1984). **Mouthparts**: lacinia wide, multispinose; galea wide, as long as lacinia (Klimaszewski, 1984). **Thorax**: mesoventrite variable, without carina to with complete carina. **Legs**: normally medium length; mesocoxae narrowly separated, with long process of mesoventrite. **Abdomen**: simple and normally fusiform; tergite of segments III–V impressed transversely at base. **Genitalia**: median lobe of aedeagus in male, usually with flagellum inside. Spermatheca of female, which are differently modified in different subgenera (Klimaszewski & Jansen, 1993), but with some exceptions. Detail descriptions are in Klimaszewski (1984).

Comments. Adults predate upon eggs, larvae, and puparia of flies; most known larvae are internal parasitoids of cyclorrhaphous flies (Peschke & Fuldner, 1977; Seevers, 1978; Klimaszewski, 1984; Maus *et al*., 1998ab, 2001; Yamazaki, 2008, 2012). Thus, *Aleochara* species are considered economically important as host agents. In contrast to the accumulation of ecological knowledge for some particular species, the taxonomy at the subgeneric level and the evolution and phylogeny of this group are poorly known.

Studies of Japanese species of *Aleochara* are also still incomplete and only 22 species in 6 subgenera have been recorded. Revisions of each subgenus for the Japanese species are also required.

Key to the littoral subgenera of the genus *Aleochara* in Japan

1. **Body thick, rather spindle shaped; head and pronotum covered with granular microstructures; pronotum somewhat uniformly elevated; tergite VIII strongly rounded, bearing with numerous large oval projections on mid to posterior surface.**

(1) Dorsal surface mat and not shining at all. Pronotum widest around base and moderately convex above; clearly smaller than head; lacking pubescence along midline. Elytra with posterior margins deeply notched laterally; surface coarsely punctured, densely covered with short but robust setae. Mesoventrite completely carinate. Dorsal surface of abdomen rugosy with numerous pubescence. [**Male**]: posterior margin of sternite VIII moderately pointed. Median lobe without subapico-ventral projections; flagellum inside very long. [**Female**]: basal portion of spermatheca coiling countless times . . . . . subgenus *Coprochara* Mulsant & Rey, 1874 [*Aleochara* (*Coprochara*) *squalithorax* Sharp, 1888] (see, Assing, 1995 for the redescription, and Maus, 1998 for information).

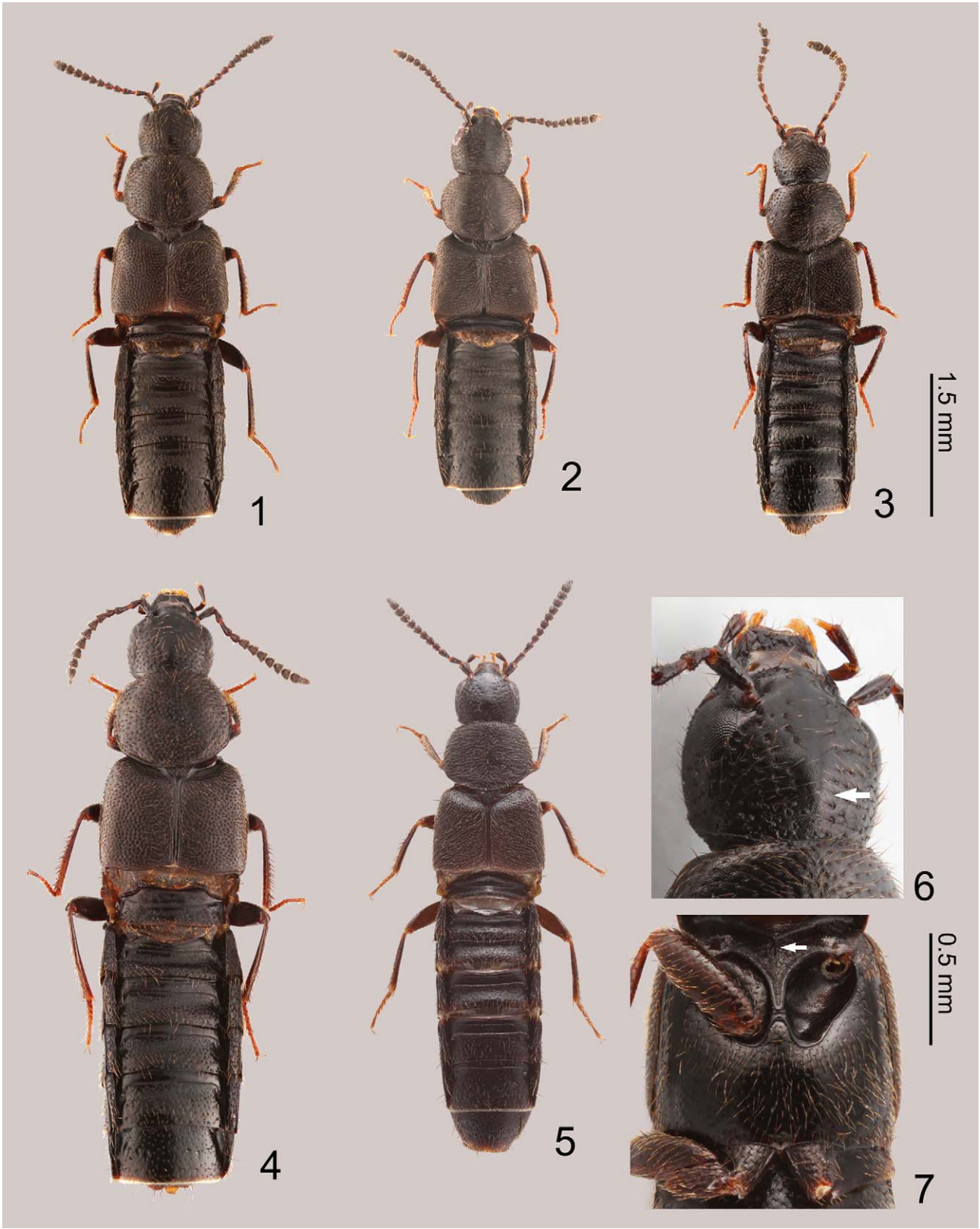
- **Body slender or narrowly elongated; pronotum almost flattened; mesoventrite without or with short (incomplete) carina; dorsal surface of abdomen shining; surface of tergite VIII simple 2**

2. **Head (Figs. 53, 57, 61) with two longitudinal furrows along midline; pronotum (Figs. 54, 58, 62) with longitudinal furrows or three-dimensional patterns.**

(2) Body (Figs. 53, 57, 61) shining to mat, forebody sparsely covered by somewhat thick and short setae. Pronotum (Figs. 53–54, 57–58, 61–62) slightly larger than head. Mesoventrite (Figs. 55–56, 59–60, 63–64) without carina. Dorsal surface of abdomen (Figs. 53, 57, 61) shining. [**Male**]: tergite VIII (Figs. 71, 79, 86) with more or less truncated posterior margin. Median lobe (Figs. 75–76, 83–84, 90–91): a pair of pointed to oval subapico-ventral projections presents; flagellum short, much shorter than median lobe. [**Female**]: tergite VIII (Figs. 72, 80, 87) similar to that of male. Spermatheca (Figs. 78, 85, 92) without coiling portion and collar (see, example of *Emplenota*: Fig. 22) . . . . . subgenus *Triochara* Bernhauer, 1901

- **Head and pronotum lack of any sulcus.**
  Antennae (Figs. 1–5, 8) long and slender, much longer than pronotum width. Head (Fig. 6) impunctate on medial line. Mesoventrite (Fig. 7) with a very short to moderate length of carination. Tergite VIII (e. g., Figs. 14–15) almost truncate, rounded or weakly emarginated, with a row of thick sensory setae (e.g., Fig. 14: arrow) at posterior margin. [**Male**]: posterior margin of sternite VIII (Figs. 16, 25, 32, 40, 48) moderately to very strongly pointed, varied greatly among species. Median lobe (Figs. 18–19, 27–28, 34–35, 43–44, 50–51): a pair of curved or straight subapico-ventral projections presents in lateral view; flagellum long to extremely long. [**Female**]: basal portion of spermatheca (Figs. 22, 29, 37, 45, 52) simple but with collar (see, Fig. 22), lacking coiling part. . . . . subgenus *Emplenota* Casey, 1884

Remarks. There is no record of the littoral subgenus *Polystomota* Casey, 1906 in Japan and adjacent regions. Therefore, it was excluded from the key above. See, Assing (1995) for detail information of *Polystomota*.



FIGURES 1–7. Japanese species of *Aleochara* (*Emplenota*) (Figs. 1–5, habitus). 1. *Aleochara* (*Emplenota*) *fucicola*; 2. *A.* (*E.*) *puetzi*; 3. *A.* (*E.*) *hayamai*; 4. *A.* (*E.*) *yamato*; 5. *A.* (*E.*) *segregata*; 6. dorsal head of *A. yamato*; 7. mesoventrite and metaventrite of *A. fucicola* in ventral view.

Subgenus *Emplenota* Casey, 1884
(Figs. 1–52, 93–97, 101–103)

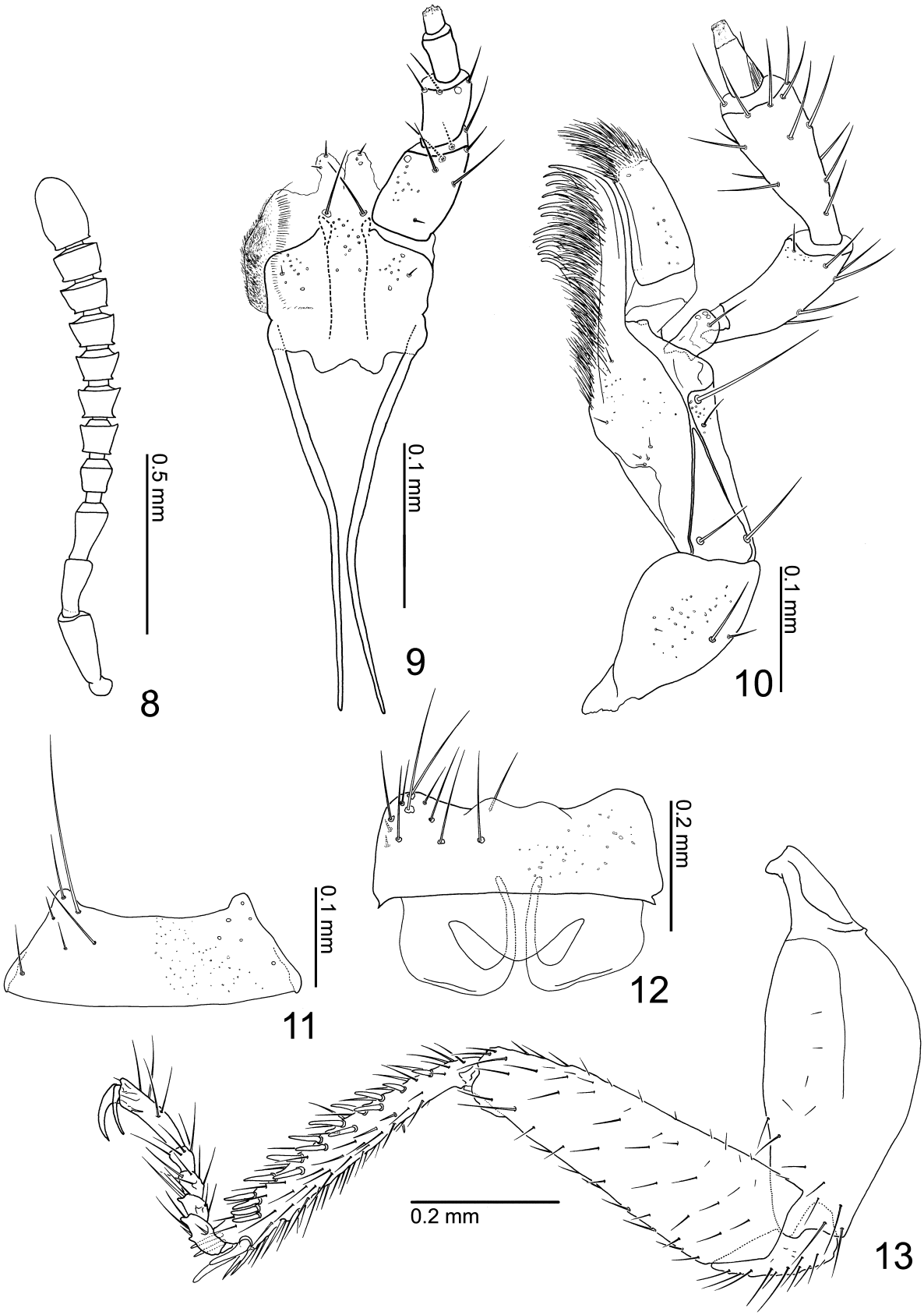
Emplenota Casey, 1884: 17 (original description; type species: *Emplenota maritima* Casey, 1884: 17, by original designation and monotypy); 1906: 131 (as genus; key of genera of subtribe "Aleocharae"), 172 (as genus; historical review; diagonostic key to species of Atlantic coast); Eichelbaum, 1909: 245 (as subgenus; generic catalogue of world Staphylinidae); Fenyes, 1920: 399 (as subgenus; key of world subgengera of *Aleochara*), 1921: 415 (as subgenus; diagnosis; catalogue of world species); Scheerpeltz, 1925: 447 (as subgenus; catalogue of Palaearctic species of Aleocharinae); Bernhauer & Scheerpeltz, 1926: 795 (as subgenus; catalogue of world species of Aleocharinae); Tottenham, 1949: 404 (as subgenus; generic catalogue of British Staphylinidae); Blackwelder, 1952: 147 (as subgenus; generic catalogue of world Staphylinidae); Hatch, 1957: 137 (as subgenus; key to *Aleochara* subgenera of Pacific Northwest), 140 (redescription of species of Pacific Northwest); Likovsky, 1974: 294 (as subgenus; key of subgenera of middle Europa); Moore & Legner, 1975: 328 (as subgenus; catalogue of Nearctic species); Seevers, 1978: 59 (as genus; key to Nearctic genera of Aleocharinae), 138 (diagnosis); Klimaszewski, 1984: 9, 10 (phylogenetic relationships of Nearctic *Aleochara*), 95 (as subgenus; revision of Nearctic *Aleochara*; redescription of subgenus), 96 (key; redescriptions of Nearctic species); Lohse, 1984: 148 (as genus; diagnosis); Lohse, 1985: 328 (as genus; key of middle European species of genera *Emplenota* and *Polystomota*); Lohse, 1989: 239 (as genus; key to genera for middle Europe), 240 (as genus; catalogue of middle European species); Assing, 1995: 219 (as genus; diagnostic key to genera), 219 (notes on genus), 220 (key to Palaearctic species), 220 (descriptions of each species); Welch, 1997: 8 (historical review of British *Emplenota* and related taxa); Maus & Ashe, 1998a (online) (as subgenus; checklist of subgenus of world; diagnosis of subgenus; bionomics; discussion of phylogenetic relationships); Ashe, 2001: 360 (as subgenus; catalogue for Nearctic species); Smetana, 2004: 356 (as subgenus; catalogue for Palaearctic Aleocharinae); Dauphin, 2005: 47 (as genus; key to genera of *Emplenota* and *Polystomota*); Gouix & Klimaszewski, 2007: 26 (as subgenus; catalogue of Aleocharine species of Canada and Alaska).

Polystoma Stephens, 1833: 91 (original description; type species: *Aleochara obscurella* Gravenhorst, 1806: 159; fixed by Stephens, 1833: 91, by monotypy); Stephens, 1835: 430 (as genus; redescription of genus); Thomson, 1861: 47 (as genus; redescription of genus), 48 (key to Scandinavian species); Mulsant & Rey, 1874: 169 (as genus; detailed redescription of genus as *Polystome* [misspelling]), 172 (key to species of France), 173 (redescriptions of species of France); Fowler, 1888: 21 (as subgenus; diagnosis; diagnostic key to species of British Islands); Casey, 1894: 289 (as genus; as "*Polistoma*" [misspelling]: see, Casey, 1906: 272; later cited by some authors as synonym of *Emplenota*); Ganglbauer, 1895: 45 (as subgenus; redescriptions of middle European species); Bernhauer, 1901a: 504 (as subgenus; redescriptions of Palaearctic species); Johansen, 1914: 31 (as subgenus; catalogue and key to species of Denmark); Fenyes, 1921: 415 (as synonym of *Emplenota*); Scheerpeltz, 1925: 447 (as synonym of *Emplenota*); Bernhauer & Scheerpeltz, 1926: 795 (as synonym of *Emplenota*); Tottenham, 1949: 404 (as synonym of *Emplenota*; note); Blackwelder, 1952: 147, 318 (as synonym of *Emplenota*); Palm, 1972: 443 (as subgenus; catalogue; redescriptions of species of Sweden); Moore & Legner, 1975: 328 (as synonym of *Emplenota*); Klimaszewski, 1984: 95 (as synonym of *Emplenota*); Lohse, 1985: 328 (as synonym of *Emplenota*); Smetana, 2004: 356 (as synonym of *Emplenota*); Gouix & Klimaszewski, 2007: 26 (as synonym of *Emplenota*).

Polystomota Casey, 1906: 136 (original description; type species: *Aleochara grisea* Kraatz, 1856: 96; fixed by Casey, 1906: 136, by original designation and monotypy); Eichelbaum, 1909: 245 (as genus; generic catalogue of world Staphylinidae); Fenyes, 1921: 415 (as synonym of *Emplenota*); Scheerpeltz, 1925: 447 (as synonym of *Emplenota*); Bernhauer & Scheerpeltz, 1926: 796 (as synonym of *Emplenota*); Blackwelder, 1952: 147, 319 (as synonym of *Emplenota*); Moore & Legner, 1975: 328 (as synonym of *Emplenota*); Seevers, 1978: 138 (as synonym of *Emplenota*); Lohse, 1985: 328 (as synonym of *Emplenota*); Lohse, 1989: 239 (as genus; key to genera and species of middle Europe); Assing, 1995: 219 (key to Asian coastal genera), 226 (as genus; key to Palaearctic species), 229 (notes on species); Welch, 1997: 9 (historical comment); Maus & Ashe, 1998b (online) (world checklist of subgenus; diagnosis; bionomics; phylogenetic relationships); Smetana, 2004: 357 (as subgenus; catalogue of Palaearctic species); Dauphin, 2005: 47 (as genus; key of genera, *Emplenota* and *Polystomota*); Frank & Ahn, 2011: 20 (as subgenus; checklist of coastal Staphylinidae of world).

Polycharina Reitter, 1909: 28 (original description; type species: *Aleochara grisea* Kraatz, 1856: 96; fixed by Reitter, 1909: 28, by monotypy); Fenyes, 1921: 415 (as synonym of *Emplenota*); Scheerpeltz, 1925: 447 (as synonym of *Emplenota*); Bernhauer & Scheerpeltz, 1926: 796 (as synonym of *Emplenota*); Blackwelder, 1952:

147, 317 (as synonym of *Emplenota*); Moore & Legner, 1975: 328 (as synonym of *Emplenota*); Lohse, 1985: 328 (as synonym of *Emplenota*).



FIGURES 8–13. Body parts of *Aleochara* (*Emplenota*) *fucicola* of male. 8. right antenna; 9. labium; 10. maxilla; 11. mentum; 12. labrum; 13. right foreleg in ventral view.

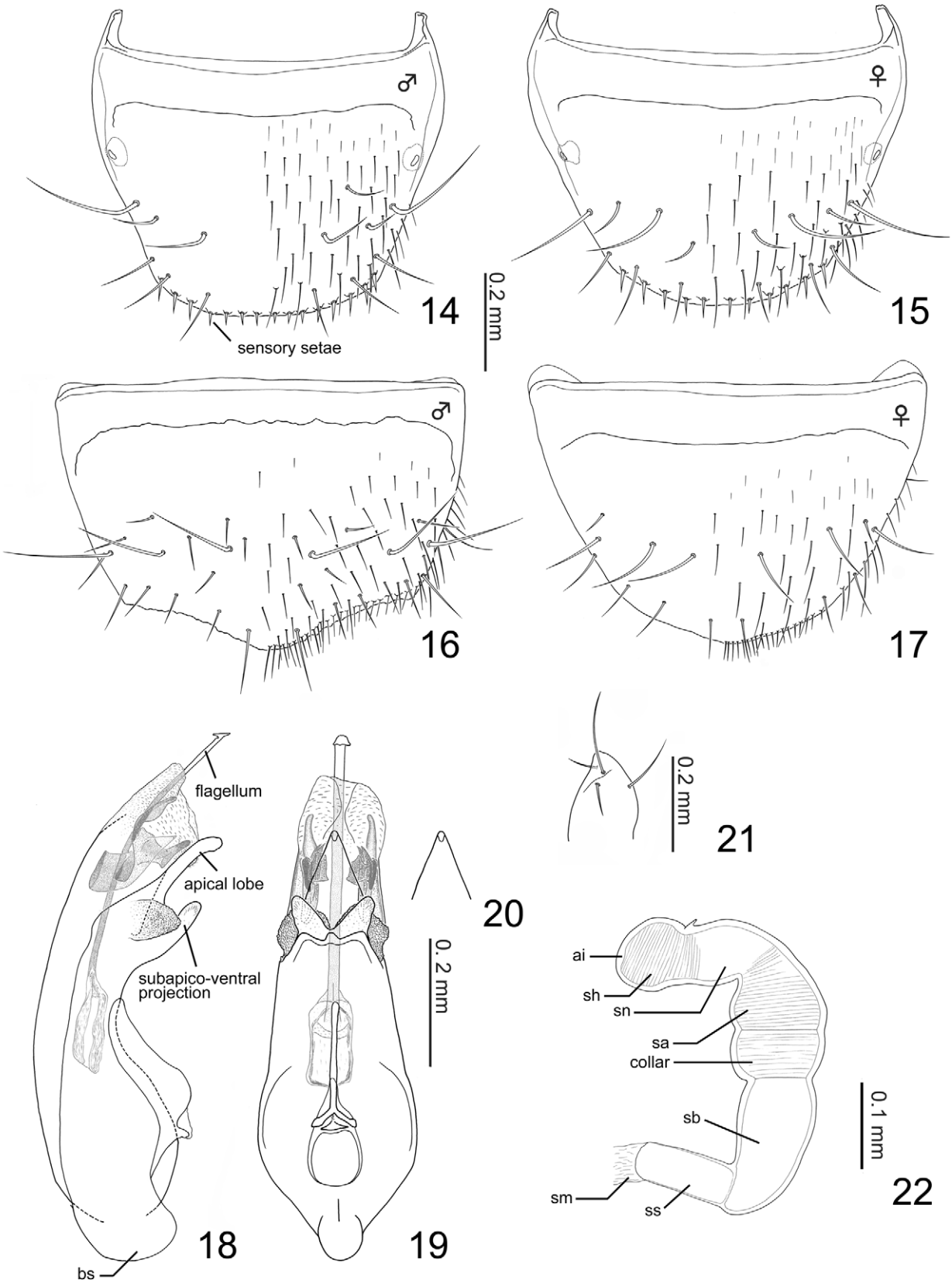
Polystomaria Reitter, 1909: 28 (original description; type species: *Aleochara obscurella* Gravenhorst, 1806: 159; fixed by Reitter, 1909: 28); Scheerpeltz, 1925: 447 (as synonym of *Emplenota*); Fenyes, 1921: 415 (as synonym of *Emplenota*); Bernhauer & Scheerpeltz, 1926: 796 (as synonym of *Emplenota*); Blackwelder, 1952: 147, 319 (as synonym of *Emplenota*); Moore & Legner, 1975: 328 (as synonym of *Emplenota*); Klimaszewski, 1984: 95 (as synonym of *Emplenota*); Lohse, 1984: 148 (as genus; diagnosis, as *Polystomaria* Casey); Lohse, 1985: 328 (as synonym of *Emplenota*); Smetana, 2004: 356 (as synonym of *Emplenota*); Gouix & Klimaszewski, 2007: 26 (as synonym of *Emplenota*).

Redescription. Body (Figs. 1–5): moderately flattened, slender and subparallel sided; whole length varying from 2.5 to 7.0 mm, normally around 3.5–4.5 mm; dorsal surface covered with minute and dense hexagonal microstructures; surface of head, pronotum and elytra covered with somewhat dense, thin hairs. Dorsal surface of abdomen shining, but head, pronotum and elytra mat (uniformly hexagonal-reticulated). **Colour** (Figs. 1–5): uniformly blackish brown to black sometimes with lighter colour in elytra. **Head**: almost circular or somewhat oval (HW/HL ≈1.14), moderately convex above, widest around middle; dorsal surface gently elevated medially, but sometimes with unique elevation partially; impunctate on medial line (e.g., Fig. 6). Eyes small, not strongly protruding laterally. **Antennae** (Figs. 1–5, 8): more or less filiform, entirely robust and long, as same as combined length of head and pronotum; segment I stout and apically dilated; and segment XI cleary long. **Mouth parts**: mandibles asymmetric, left one with one tooth near apex. Clypeus rounded apically. Labrum (e. g., Fig. 12) about 1.7 times as wide as long; anterior margin moderately emarginated medially; basal half semi-transparent. Labial palpus (Fig. 9) with segment I clearly longer than II; segment II dialated. Mentum (Fig. 11) much wider than long, nearly trapezoidal; anterior margin strongly emarginated; numerous pseudopores scattered randomly. Maxillary palpus (Fig. 10) distinctly segmented; segment I long and thick; segment II shorter and narrower than I; segment III slightly shorter and narrower than II; pseudosegment much shorter than other segments; lacinia with numerous hairs and with about 11 thick spines pectinately. **Thorax**: pronotum oval and somewhat transverse (PW/PL ≈1.24), longer than head length (PL/HL ≈1.25), somewhat broader than head (PW/HW ≈1.36), widest around middle, moderately constricted near base; outer margin around middle with a pair of relatively long blackish macrosetae; surface flat and evenly pubescent but sometimes with deep and distinct punctures on dorsal surface numerously. Hypomera fully visible in lateral view. Inter coxal cavities of mesoventrite (e.g., Fig. 7) narrowly or moderately separated. Mesoventrite with short carina (Fig. 7: arrow), or not carinate. **Elytra**: widened toward posterior margin, much broader than long (EW/EL ≈1.56), and somewhat wider than pronotum (EW/PW ≈1.28); posterior margin of each elytra nearly truncate but gently rounded toward posterior margins; surface somewhat rugosely punctured both hexagonal microsculptures and prominent distinct punctures in some species; entire surface densely covered with brown setae; anterior margin with one relatively long blackish bristle. **Legs** (e. g., Fig. 13): short and slender with short hind tarsi; numerous spines and bristles on dorsal surface of each tibia, especially on foretibia (Fig. 13); midtibia as long as metaventrite; each tarsal segment almost same width (segment V excluding claws); hindtarsi short (hind tarsal length/mid tarsal length ≈1.31). **Hind wings**: entire; veins weakly sclerotized and very obscure; posterior margin with a row of minute white hairs. **Abdomen**: elongated and slightly narrowed toward posterior segments, narrowing abruptly around apex, widest around segment III–IV; at least tergite III–VI (Figs. 1–5) transversely impressed at base. Surface of tergite VIII and sternite VIII simple and smooth. Posterior margin of tergite VIII (Fig. 14–15, 23–24, 30–31, 38–39, 46–47), bearing thick and short several sensory setae (see, Fig. 14: arrow).

[**Male**]: posterior margin of sternite VIII (Figs. 16, 25, 32, 40, 48) normally pointed, and its shape varies among species. Median lobe (Figs. 18–19, 27–28, 34–35, 43–44, 50–51) elongated, widest around base. Median lobe with a pair of subapico-ventral projections (see, Fig. 18) on median lobe; prominent inner sac with long projecting flagellum (e. g., Figs. 18–19, 43–44) at least almost as long as median lobe of aedeagus. Paramerite longer than median lobe of aedeagus; apical lobe of paramerite (Fig. 21) short and pointed, bearing with four setae.

[**Female**]: posterior margin of tergite VIII, almost truncate, rounded or slightly emarginated; surface of tergite VIII (Figs. 15, 24, 31, 39, 47) similar to that of male. Posterior margin of sternite VIII (Figs. 17, 26, 33, 41, 49) slightly or moderately pointed. Spermatheca (Figs. 22, 29, 37, 45, 52; see, Fig. 22) with apical invagination of spermatheca (ai) sharrow; spherical head of spermatheca (sh), as long as or longer than apical portion of spermathecal stem (sa); neck of spermatheca (sn) and (sa) forming more or less in right angle; basal portion of spermathecal stem (sb), narrowing toward base; distinct collar located between (sa) and (sb); sclerotized portion of spermathecal stem (ss) short and erect in most cases; membraneous portion of spermathecal duct (sm) moderate to

long length; inner wall of (sh), (sa) and collar moderately striate; each part of spermatheca except for (sm) weakly to moderately sclerotized.



FIGURES 14–22. Terminalia of *Aleochara* (*Emplenota*) *fucicola*. 14. tergite VIII of male; 15. tergite VIII of female; 16. sternite VIII of male; 17. sternite VIII of female; 18. male genitalia: median lobe of aedeagus in lateral view; 19. male genitalia: median lobe of aedeagus in ventral view; 20. apical lobe of median lobe in ventral aspect; 21. apical lobe of paramerite, lateral view; 22. female genitalia: spermatheca.

Diagnosis. The members of this subgenus are similar in habitus to those of the tribe Athetini (e.g., genera *Adota* Casey, 1910; *Psammostiba* Sawada, 1976) found in Japanese seashore, but are discriminated from them by the following character states: antennae shorter, somewhat shorter or almost same as combined length of head and pronotum; maxillary palpi with four segments and a pseudosegment; labial palpi with three segments and a pseudosegment; tarsal fomula: 5-5-5; [**Male**]: median lobe of aedeagus with a prominent flagellum; a pair of subapico-ventral projections on median lobe (see, Figs. 18–19); [**Female**]: spermatheca lack of any coiling part; spermathecal stem with a distinct collar (see, example of Fig. 22).

As sympatric species of *Aleochara*, *A.* (*Coprochara*) *squalithorax* Sharp, 1888 is also similar in general appearance, but differentiated from it as follows: body clearly flattened; antennae longer and slender, more or less shorter or longer than head and pronotum combined; dorsal surface of pronotum flattened; dorsal surface of pronotum smooth (*A. squalithorax* Sharp, 1888 with rough surface and with elevated pronotum; see, also key of the littoral subgenera); [**Male**]: aedeagus with a pair of subapico-ventral projections (Figs. 18–19); [**Female**]: spermatheca lack of coiling portion (e.g., Fig. 22) (*A. squalithorax*, basally coiled numerous times).

Comments. Some species have a spherical or longitudinal elevation on the dorsal surface of the head base (e.g., Fig. 6: arrow) and these are important character states for distinguishing between each species. Assing (1995) noted that different pronotal pubescence patterns can be discriminated between two geographical groups, namely, between those in North America and the eastern Palaearctic and those in the western Palaearctic. Klimaszewski (1984) redefined the subgenus and noted some important character states, including mesoventrite not carinate and antennae with fourth segment spherical; however, these characters are not important and are shared by only some species in the subgenus. Welch (1997) and Park and Ahn (2004) already pointed out the presence of a carina on the mesoventrite for some species, including *Aleochara fucicola*.

Emplenota species are parasitoids on the dipteran families: Anthomyiidae, Coelopidae, and Sepsidae. These dipteran families have hitherto been recorded as host agents (Peschke & Fuldner, 1977; Maus *et al*., 1998b; Yamazaki, 2008, 2012). Descriptions of the larvae of the European species, *Aleochara* (*Emplenota*) *obscurella* Gravenhorst, 1806 (as *A. algarum* Fauvel, 1862) are in Lesne and Mercier (1922) and Paulian (1938, 1941: 313). Pupation takes place inside the puparia of flies (Scott, 1920; Yamazaki, 2008, 2012).

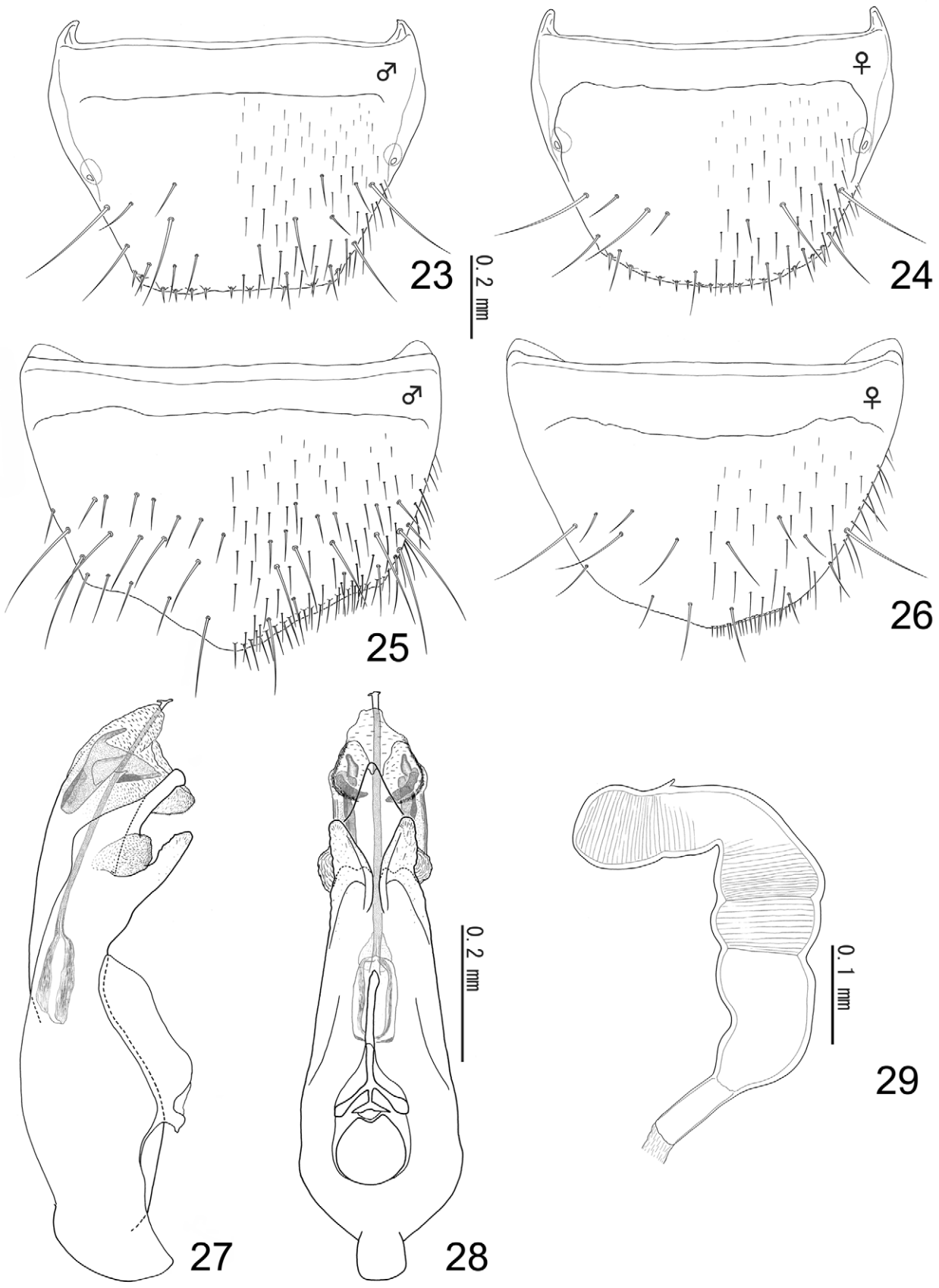
Aleochara (*Emplenota*) *fucicola* Sharp, 1874

(Figs. 1, 7–22, 93–94, 97, 101)

Aleochara fucicola Sharp, 1874: 9 (original description; type locality: "Amakusa and Iwosima, near Nagasaki" [Amakusa-shi, Kumamoto-ken (or Iô-jima, Nagasaki-shi, Nagasaki-ken), Kyûshû, Japan]); Lewis, 1879: 6 (catalogue of Japanese Coleoptera); Schönfeldt, 1887: 66 (catalogue of Japanese Coleoptera); Sawada, 1972: 36 (maxilla, illustrated), 37 (description of lacinia), 39 (chaetotaxy of labial pulpus), 40 (comments on pores on labial palpus), 40 (comments on paramerite); Shibata, 1985: 321 (description in Japanese; Coleoptera of Japan), pl. 56 (habitus of specimen); Naomi, 1989: 280 (checklist of Japanese Staphylinidae); Li & Wang, 1993: 154 (catalogue of soil beetles of Anhui Province, China).

Aleochara (*Emplenota*) *fucicola* Sharp, 1874; Fenyes, 1921: 415 (catalogue of world species of Aleocharinae); Scheerpeltz, 1925: 447 (catalogue of Palaearctic species of Staphylinidae); Bernhauer & Scheerpeltz, 1926: 796 (catalogue of world species of Staphylinidae); Adachi 1957: 34 (catalogue of Japanese species of Staphylinidae); Nakane, 1963: 100 (description in Japanese; Coleoptera of Japan), pl. 50 (habitus of specimen); Sawada, 1971: 309 (redescription); Sawada, 1972: table (character states, listed); Welch, 1997: 9 (comments on carina on mesoventrite); Maus & Ashe, 1998a (online) (checklist of subgenus of world; phylogenetic relationship); Cho & Ahn, 2001: 14, 30 (checklist of Korean species of Silphidae and Staphylinidae), 157 (pl. 2) (habitus of specimen); de Rougemont, 2001: 84 (record from Hong Kong); Park & Ahn, 2004: 195 (key to littoral species of Korean *Aleochara*; redescription); Smetana, 2004: 356 (catalogue of Palaearctic Aleocharinae); Yamazaki, 2008: 152 (dipteran host record); Frank & Ahn, 2011: 19 (checklist of coastal Staphylinidae of world); Yamazaki, 2012: 32 (ecological research).

Emplenota fucicola (Sharp, 1874); Assing, 1995: 220 (diagnostic key to Palaearctic species of *Emplenota*), 223 (redescription; lectotype designation); Paśnik, 2001: 231 (record from North Korea); Dauphin, 2005: 48 (record from Gironde, France).



FIGURES 23–29. Terminalia of *Aleochara* (*Emplenota*) *puetzi*. 23. tergite VIII of male; 24. tergite VIII of female; 25. sternite VIII of male; 26. sternite VIII of female; 27. male genitalia: median lobe of aedeagus in lateral view; 28. male genitalia: median lobe of aedeagus in ventral view; 29. female genitalia: spermatheca.

Homalota variolosa Weise, 1877: 89 (original description; type locality: “Hagi” [Yamaguchi-ken, western end of Honshû, Japan]); Lewis, 1879: 6 (catalogue of Japanese Coleoptera); Schönfeldt, 1887: 66 (catalogue of Japanese Coleoptera); Assing, 1995: 223 (synonymized with *A. fucicola*; lectotype designation); Ahn *et al*., 2000: 244 (as synonym of *A. fucicola*); Smetana, 2004: 356 (catalogue; as synonym of *A. fucicola*); Park & Ahn, 2004: 196 (as synonym of *A. fucicola*); Frank & Ahn, 2011: 19 (checklist; as synonym of *A. fucicola*).

Aleochara (*Emplenota*) *variolosa* (Weise, 1877); Fenyes, 1921: 415 (catalogue of world species of Aleocharinae); Scheerpeltz, 1925: 447 (catalogue of Palaearctic species of Staphylinidae); Bernhauer & Scheerpeltz, 1926: 797 (catalogue of world species of Staphylinidae); Adachi 1957: 34 (catalogue of Japanese species of Staphylinidae).

Aleochara variolosa (Weise, 1877); Li & Chen, 1990: 19 (catalogue of northeast Chinese species of Staphylinidae); Li, 1993: 46 (catalogue of northeast Chinese species of Staphylinidae); Li & Wang, 1993: 154 (catalogue of soil beetles of Anhui Province, China).

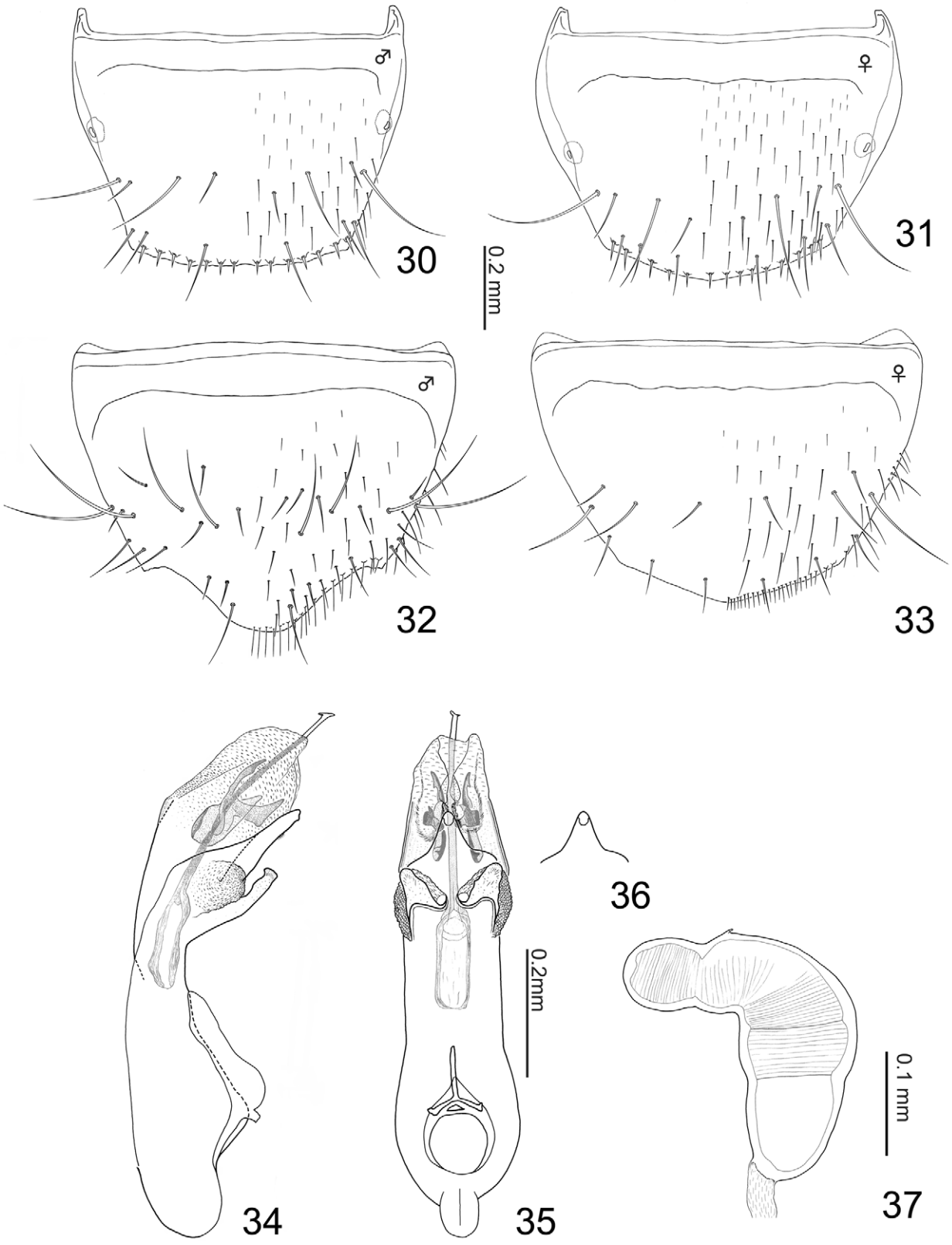
Type specimens. *A. fucicola*: **[Lectotype]**: ♀, “Japan [YRLS]//Japan./G. Lewis//Sharp Coll./1905-313// Aleochara/fucicola ♀[HW]/type D. S. [HW]//Lectotypus/design. Assing, 1994//LECTO-/TYPE [PRL]” [**Paralectotypes**]: 2 ♂, “Type [RRL]//Japan [YRLS]//Japan./G. Lewis//Sharp Coll./1905-313//Aleochara/fucicola Sharp”; 1 ♀, 1 sex?, “Japan [YRLS]//Japan./G. Lewis//Sharp Coll./1905-313//Para-/lecto-/type [BRL]”. Designated by Assing (1995).

H. variolosa: Not examined.

Non-type specimens. JAPAN: **[Honshû]**: 1 ♂, 1 ♀, Kosode, Ube-chô, Kuji-shi, Iwate-ken (40.168N, 141.848E), 28 VI 2010, Ôhara-M., Kobayashi-N., Yamamoto-H. (40°10′05″N, 141°50′54″E; collected from seaweed (*Sargassum* sp., *Laminaria* sp.) and eel grass (*Zostera* sp.) on cobble beach; collections of HUM: HN-10-MO-043/CO); 1 ♂, 1 ♀, Raga, Tanohata-mura, Shimohei-gun, Iwate-ken (39.939N, 141.940E*), 30 V 1998, Watanabe-T. (cWat); 2 ♂, 3 ♀, Omoto, Iwaizumi-chô, Shimohei-gun, Iwate-ken (39.850N, 141.974E), 27 VI 2010, Ôhara-M. (39°50′59″N, 141°58′27″E; sandy beach; HUM: HN-10-MO-042/SA); 2 ♂, 1 ♀, Hamaogi-kaigan, Hamaogi, Kamogawa-shi, Chiba-ken (35.118N, 140.144E), 24 IV 1990, Takeda-T. (KUM); 1 ♀, Shinmaiko-kaigan, Yawata, Futtsu-shi, Chiba-ken (35.250N, 139.866E), 11 VI 1995, Emoto-K. (cWat); 2 ♀, river mouth of Obitsu-gawa, Kuzuma, Kisarazu-shi, Chiba-ken (35.412N, 139.906E*), 19 II 2007, Ono-H. (cOno); 1 ♂, 2 ♀, same data, but 2 III 2007; 5 ♂, 8 ♀, same data, but 13 III 2007; 1 ♂, 2 ♀, river mouth of Obitsu-gawa, Kuroto, Kisarazu-shi, Chiba-ken (35.411N, 139.900E), 27 V 1983, Nemoto-K. (under drifted woods; KUM); 4 ♂, 9 ♀, same place, but 25 IV 1987, Haga-K. (from decaying seaweed; KUM); 3 ♀, Yakenga-hama (Hachijô-jima), Ôkagô, Hachijô-machi, Tôkyô-to (33.100N, 139.770E), 26 VI 2011, Hayama-T. (33d06'02N, 139d46'11E; shingle beach, composed of lava; cHayam); 3 ♂, 1 ♀, same data, but 27 VI 2011; 1 ♀, Kaneda beach, Kaneda, Minamishitaura-machi, Miura-shi, Kanagawa-ken (35.167N, 139.660E), 19 III 2001, Watanabe-T. (cWat); 1 ♀, Bishamon, Minamishitaura-machi, Miura-shi, Kanagawa-ken (35.142N, 139.650E*), 21 IV 1994, Ohgi-K. (cWat); 2 ♂, Jôgashima (Jôga-shima), Misaki-machi, Miura-shi, Kanagawa-ken (35.132N, 139.621E*), 10 IV 2003, Watanabe-T. (cWat); 3 ♀, Mito beach, Hasse-machi, Miura-shi, Kanagawa-ken (35.177N, 139.620E), 28 V 2001, Watanabe-T. (cWat); 1 ♂, 2 ♀, same data, but 29 V 2007; 1 ♀, same data, but 14 V 2009; 1 ♀, same data, but 12 VI 2009; 1 ♀, Arasaki, Nagai, Yokosuka-shi, Kanagawa-ken (35.194N, 139.600E*), 12 VI 2009, Watanabe-T. (cWat); 1 ♀, Enoshima (Eno-shima), Fujisawa-shi, Kanagawa-ken (35.300N, 139.485E*), 11 VI 2001, Watanabe-T. (cWat); 1 ♀, Hatsushima (Hatsu-shima), Atami-shi, Shizuoka-ken (35.041N, 139.167E*), 12 XI 2000, Kurihara-T. (shore reef on intertidal zone; EEEU); 39 ♂, 59 ♀, Tsumeki-zaki, Shimoda-shi, Shizuoka-ken (34.659N, 138.987E), 21 IV 2003, Maruyama-M. (cMar); 5 ♂, 7 ♀, Ogi, Noto-machi, Fugeshi-gun, Ishikawa-ken (N37.301, 137.234E), 1 V 1961, Hayashi-Y. (cHayas); 1 ♀, Ôshima (Ô-shima), Kushimoto-chô, Higashimuro-gun, Wakayama-ken (33.468N, 135.800E*), 30 IV 1959, Kimura-Y. (cHayas); 1 ♂, Isonoura, Wakayama-shi, Wakayama-ken (34.259N, 135.093E), 21 II 1981, Itô-T. (cHayas); 1 ♀, Miyama (Tomoga-shima), Wakayama-shi, Wakayama-ken (34.280N, 135.014E*), 16 VI 2007, Kawakami-Y. (cKaw); 1 ♂, 2 ♀, Nada-kaigan (Awaji-shima), Nada, Minamiawaji-shi, Hyôgo-ken (34.207N, 134.812E*), 1 IV 1977, Kaneda (KUM); 1 ♀, Nakayagi, Akashi-shi, Hyôgo-ken (34.670N, 134.931E), 9 V 1999, Kawakami-Y. (cKaw); 1 ♀, river mouth of Chigusa-gawa, Onzaki, Akô-shi, Hyôgo-ken (34.731N, 134.393E), 15 VI 1999, Kawakami-Y. (cKaw); 1 ♀, Kugui, Higashi-ku, Okayama-shi, Okayama-ken (34.584N, 134.086E*), 31 III 2003, Fujitani-Y. (under seaweed; KUM); 2 ♂, 2 ♀, same data, but 5 V 2003; 1 ♂, 4 ♀, same data, but 9 V 2003 (under seaweed); 4 ♂, 3 ♀, same data, but 28 V 2003 (under seaweed); 1 ♂, 1♀, Kusumihana, Ôbatake, Kurashiki-shi, Okayama-ken (34.430N, 133.822E*), 8 VI 2003, Fujitani-Y. (KUM); 7 ♂,

Okidomari, Tako, Shimane-chô, Matsue-shi, Shimane-ken (35.604N, 133.096E*), 3 VI 2008, Hayama-T. (from seaweed; cHayam); 1 ♀, Konami-kaigan, Nonami, Shimane-chô, Matsue-shi, Shimane-ken (35.588N, 133.098E), 19 VII 2010, Yamamoto-S. (from seaweed on small sandy beach; cYam); 9 ♂, 9 ♀, Kakanokuketo, Shimane-chô, Matsue-shi, Shimane-ken (35.578N, 133.050E), 1 IV 2009, Hayama-T. (shingle beach; cHayam); 4 ♀, same data, but 9 VI 2009; 3 ♂, 3 ♀, same data, but 17 VII 2010, Yamamoto-S. (from rotten seaweed on shingle beach; cYam); 2 ♂, 5 ♀, same data, but 18 VII 2010; 1 ♀, same data, but 19 VII 2010; 1 ♂, 39 ♀, Koura-kaigan, Koura, Kashima-chô, Matue-shi, Shimane-ken (35.521N, 132.975E), 8–10 VI 2009, Hayama-T. (sandy beach; FIT; cHayam); 1 ♂, 41 ♀, same data, but 18–20 VI 2009; 1 ♀, same data, but 20–22 VI 2009; 1 ♂, 5 ♀, same data, but 3–5 VII 2009; 18 ♀, same data, but 16–18 VII 2009; 5 ♂, 6 ♀, same data, but 17 VII 2010, Yamamoto-S. (under flotsam on sandy beach; cYam); 3 ♂, 1 ♀, same data, but 18 VII 2010; 1 ♀, Sakaura-kaigan, Sakaura-chô, Izumo-shi, Shimane-ken (35.508N, 132.861E), 4 VII 2008, Hayama-T. (shingle beach with shore reef; cHayam); 1 ♂, same data, but 20 IV 2009; 4 ♀, same data, but 15 V 2009 (from seaweed); 1 ♀, river mouth of Sakaura-gawa, Sakaura-chô, Izumo-shi, Shimane-ken (35.508N, 132.861E), 30 IV 2008, Hayama-T. (cHayam); 1 ♂, same data, but 31 VIII 2008; 1 ♂, same data, but 24 III 2009; 2 ♂, 2 ♀, river mouth of Mitsu-gawa, Mitsu-chô, Izumo-shi, Shimane-ken (35.498N, 132.826E), 30 IV 2008, Hayama-T. (cHayam); 4 ♂, 8 ♀, Owashi-hama, Nakayama, Taisha-chô, Izumo-shi, Shimane-ken (35.433N, 132.634E), 24 III 2009, Hayama-T. (shingle beach; cHayam); 3 ♂, 5 ♀, same data, but 10 IV 2009; ; 1 ♀, Akaishihana, Hinomisaki, Taisha-chô, Izumo-shi, Shimane-ken (35.411N, 132.650E*), 2 IV 2009, Hayama-T. (cHayam); 8 ♂, 11 ♀, same data, but 2–8 V 2009 (FIT); 1 ♀, Kuchitaki, Taki-chô, Izumo-shi, Shimane-ken (35.271N, 132.581E), 18 IV 2009, Hayama-T. (cHayam); 2 ♀, Kiami-chô, Masuda-shi, Shimane-ken (34.676N, 131.750E*), 15 VI 2008, Hayama-T. (cHayam); 1 ♀, same data, but 10 V 2009. **[Shikoku]**: 1 ♂, Komatsubara, Matsubara, Higashikagawa-shi, Kagawa-ken (34.254N, 134.377E), 5 IV 2008, Fujimoto-H. (KUM); 1 ♂, 4 ♀, Ariake-hama, Muromoto-chô, Kanonji-shi, Kagawa-ken (34.139N, 133.642E), 9 IV 2011, Fujimoto-H. (sandy beach; KUM); 20 ♂, 11 ♀, Iwagi (Akahone-jima), Kamijima-chô, Ochi-gun, Ehime-ken (34.235N, 133.159E*), 2 V 2009, Satô-Y. (EEEU); 1 ♂, same data, but 7 V 2010, Senda-Y.; 1 ♂, Shimoda (sandy and pebbly beach near Hirano-gyokô fishing port), Shimanto-shi, Kôchi-ken (32.948N, 132.995E), 21 IV 2012, Yamamoto-S. (from decaying seaweed on sandy beach; cYam); 2 ♀, Murotomisaki, Murotomisaki-chô, Muroto-shi, Kôchi-ken (33.245N, 134.177E*), Kan-T. (EEEU). **[Kyûshû]**: 3 ♂, 4 ♀, Kuroga-hama, Ôguro, Saganoseki, Ôita-shi, Ôita-ken (33.258N, 131.898E), 20 VI 2012, Yamamoto-S. (under seaweed and flotsam during daytime on cobble beach; cYam); 3 ♂, 1 ♀, Kin (Tsu-shima), Kamitsushima-chô, Tsushima-shi, Nagasaki-ken (34.568N, 129.469E), 5 V 2009, Yamamoto-S. (from decaying seaweed on sandy beach with *Aleochara* (*Triochara*) *trisulcata*; cYam); 2 ♂, Kazusa-chô, Minamishimabara-shi, Nagasaki-ken (32.625N, 130.164E*), 8 II 1978, Imasaka-S. (KUM); 1 ♀, Kuchinotsu-chô, Minamishimabara-shi, Nagasaki-ken (32.610N, 130.190E*), 18 II 1979, Imasaka-S. (KUM); 1 ♀, Nomo-machi (Nomo-zaki), Nagasaki-shi, Nagasaki-ken (32.580N, 129.754E*), 3 VI 1987, Yahiro-K. (KUM); 24 ♂, 39 ♀, Tomioka (Amakusa-syotô), Reihoku-machi, Amakusa-gun, Kumamoto-ken (32.519N, 130.037E), 3 IV 1977, Naomi-S.I. (KUM); 2 ♂, Sato (Kamikoshiki-jima), Sato-machi, Satsumasendai-shi, Kagoshima-ken (31.844N, 129.919E), 11–12 IV 1973, Furuki-Y. (EEEU).

Redescription. Body (Fig. 1): medium size; robust, narrowly subparallel; surface of head, pronotum and elytra covered with numerous hairs; somewhat densely and numerous distinct punctures on dorsal surface (head, pronotum and elytra). **Colour** (Fig. 1): blackish brown in ground colour, but slightly paler in elytra; legs, especially tarsal segments, brown to reddish brown; maxillary and labial palpi reddish brown to yellowish brown; antennae dark brown but reddish brown around basal segements. **Head**: longitudinal impunctured area along midline on dorsal surface not clearly swollen (not carinate); entire surface roughly covered with setae except for impunctured area. **Antennae** (Fig. 8): moderately thick and robust; segment I, 2.3 times as long as broad; segment II clearly shorter than I; segment III slightly longer than II but shorter than I; each segment of IV to VI as long as width; segments VII to X moderately broader than length; segment XI subconical with rounded apical margin, 1.4 times as long as broad; relative length (width) of segments from basal to apical: 9(4): 5.5(3): 6(3.5): 3.5(3.5): 4(4): 4(4): 3.5(4.5): 3.5(5): 3.5(5): 3.5(5.5): 7.5(5.5). **Thorax**: pronotum slightly wider than long (PW/PL =1.23), a little broader than head (PW/HW =1.34); dorsal surface mat with hexagonal reticulations, and with somewhat shallow, but distinct punctures. Metaventrite (Fig. 7), about 1.8 times as long as mesoventrite. Inter coxal process of mesoventrite pointed, with short carina, about 0.4 times as long as mesoventrite. Inter coxal process of metaventrite (Fig. 7) broad, rather short, one third as long as mesocoxal cavity, rounded apically. **Legs**: relative lengths of tarsomeres from basal to apical: 5: 3: 3: 3: 11 in foretarsus, 7: 4.5: 4.5: 5: 13 in midtarsus, 8: 7: 6: 6: 15.5 in hindtarsus.



FIGURES 30–37. Terminalia of *Aleochara* (*Emplenota*) *segregata*. 30. tergite VIII of male; 31. tergite VIII of female; 32. sternite VIII of male; 33. sternite VIII of female; 34. male genitalia: median lobe of aedeagus in lateral view; 35. male genitalia: median lobe of aedeagus in ventral view; 36. apical lobe of median lobe in ventral aspect; 37. female genitalia: spermatheca.

[**Male**]: tergite VIII (Fig. 14) slightly rounded toward apex, with around 6 macrosetae. Sternite VIII (Fig. 16) with about 4 macrosetae and around 10 thin macrosetae; posterior margin weakly produced medially. Median lobe of aedeagus (Figs. 18–19) elongated, moderately narrowed apically, elongated pyriform in ventral view (Fig. 19); a

pair of subapico-ventral projections gently curved in lateral view (Fig. 18); basal swelling of aedeagus (bs), circularly rounded in lateral view (Fig. 18); apical lobe of median lobe clearly isosceles shape in ventral aspect (Figs. 19–20); flagellum slightly shorter than the whole length of median lobe (Figs. 18–19).

[**Female**]: posterior margin of tergite VIII (Fig. 15) rounded, with around 7 macrosetae. Sternite VIII (Fig. 17) with 3 large macrosetae and around 4 thinner macrosetae; posterior margin slightly pointed. Spermatheca (Fig. 22): spermathecal head more or less as long as apical portion of spermathecal stem; basal portion of spermathecal stem (sb) slightly narrowing toward base, lacking any bent around middle and usually at base; sclerotized portion of spermathecal stem erect, connected with (sb) almost horizontally; each part of spermatheca except for membraneous portion of spermathecal duct (sm) entirely and moderately sclerotized; (sm) moderate in length.

Measurements (male: n=10): BL, 3.58–4.59 (4.02±0.32); FBL, 1.16–2.03 (1.83±0.16); HL, 0.43–0.60 (0.51±0.06); HW, 0.46–0.66 (0.59±0.06); AL, 0.79–1.27 (1.08±0.15); PL, 0.48–0.73 (0.64±0.07); PW, 0.50–0.90 (0.77±0.12); EL, 0.54–0.83 (0.67±0.09); EW, 0.77–1.21 (1.02±0.13); HTL, 0.45–0.73 (0.61±0.08).

Measurements (female: n=10): BL, 3.36–5.18 (4.23±0.55); FBL, 1.63–2.12 (1.90±0.16); HL, 0.47–0.57 (0.53±0.03); HW, 0.49–0.65 (0.60±0.05); AL, 0.87–1.23 (1.08±0.12); PL, 0.56–0.73 (0.66±0.05); PW, 0.66–1.04 (0.83±0.11); EL, 0.58–0.80 (0.69±0.08); EW, 0.86–1.18 (1.06±0.11); HTL, 0.48–0.71 (0.61±0.08).

Diagnosis. This species can be distinguished from the other species of *Emplenota* by a combination of the following character states: normally medium body sized; dorsal surface of forebody with numerous distinct punctures (Fig. 1); impunctured area of dorsal surface of head scarcely swollen (almost flattened); mesoventrite with short carina about 0.41 times as long as mesoventrite (Fig. 7). [**Male**]: sternite VIII (Fig. 16) somewhat weakly pointed toward apex; subapico-ventral projections on median lobe gently curved in lateral view (Fig. 18); basal swelling of median lobe (bs), circularly rounded in lateral view (Fig. 18); median lobe elongated pyriform (Fig. 19) and apical lobe isosceles shape in ventral aspect (Fig. 20). [**Female**]: basal portion of spermathecal stem (sb) (Fig. 22) simple, and gently or moderately curved without bent at middle and base, with sclerotized and erect sclerotized portion of spermathecal stem (ss).

Confirmed distribution by present study. [**JAPAN**]: Honshû, Shikoku, Kyûshû, Hachijô-jima, Awaji-shima, Tsu-shima, Amakusa-shotô, Kamikoshiki-jima. See, Fig. 101 for Japanese distribution.

Other localities in literature. [**SOUTH KOREA**]: Chungnam Province, Gyeongnam Province, Jeonnam Province, Jeju Province (Park & Ahn, 2004); [**NORTH KOREA**]: Hamgyong Province (Paśnik, 2001); [**CHINA**]: Heilongjiang (Li & Chen, 1990, 1993: both doubtful records), Anhui (Li & Wang, 1993), Hong Kong (de Rougemont, 2001); [**RUSSIA**]: Far East (Ahn *et al*., 2000: no original citation; locality doubtful); [**FRANCE**]: Région Aquitaine (Dauphin, 2005).

Remarks. This species was originally described "under seaweed at Amakusa and Iwosima, near Nagasaki", (Kyûshû, Japan: Sharp, 1874) and later redescribed by Sawada (1971), Assing (1995), and Park and Ahn (2004). Sawada (1971) emphasised the chaetotaxy of mouth parts, while Assing (1995) paid special attention to the setal condition of the dorsal surface of pronotum. Park and Ahn (2004) provided a short diagnosis with figures.

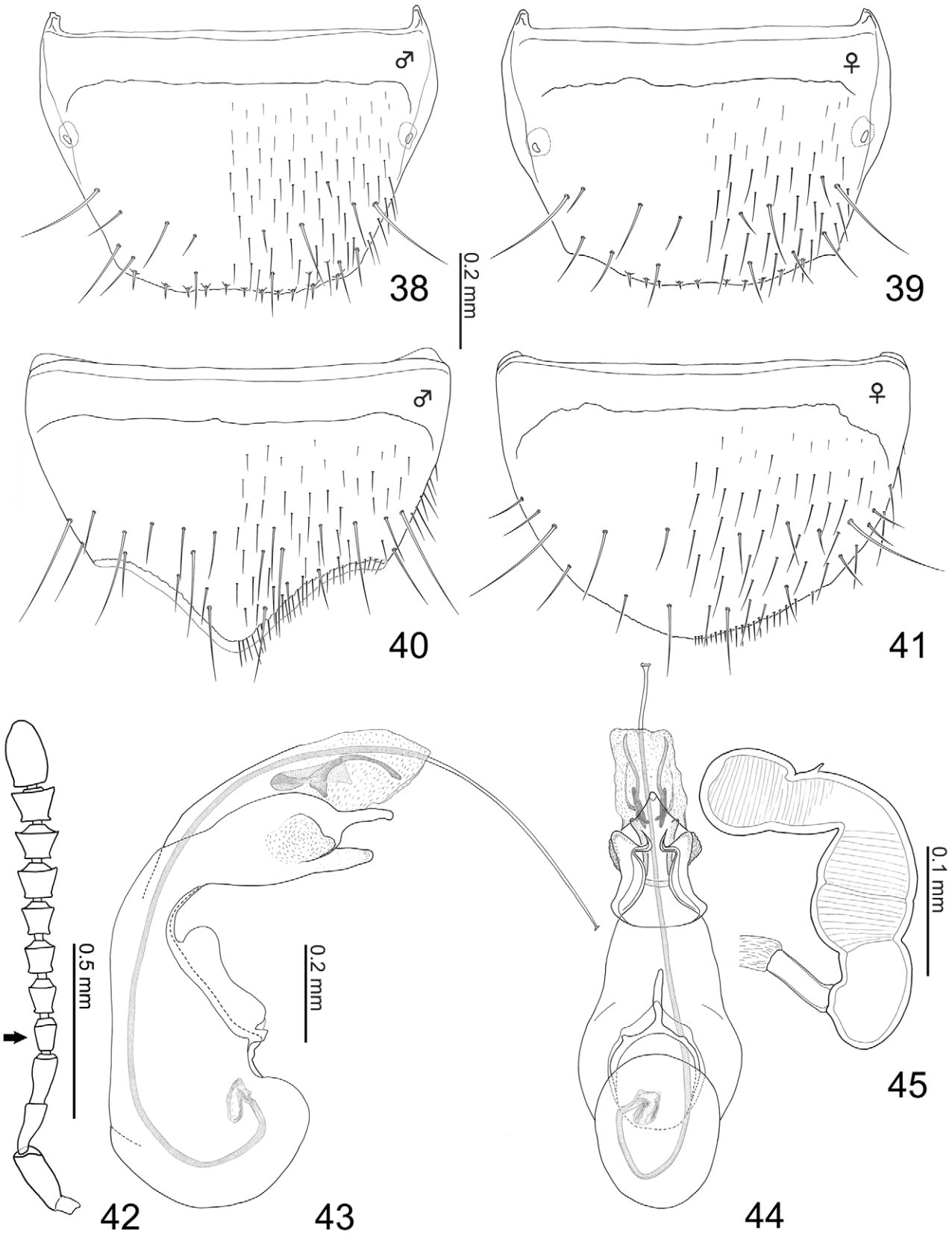
Ahn *et al*. (2000) shortly redescribed *Aleochara fucicola*, but Park and Ahn (2004) regarded it as a misidentification of *A. puetzi* (Assing, 1995) and redescribed it again. However, according to their illustrations of the aedeagus, it is part of a new species being described in the present paper, *A. segregata*, although the figure of the spermatheca in Ahn *et al*. (2000) seems to belong to *A. fucicola*.

The distribution of *A. fucicola* is very wide. Although records have been restricted in East Asia for a long time, Dauphin (2005) recorded the species from north-western France (Région Aquitaine, Gironde). This amazing record seems accurate, as Dr. V. Assing identified the specimens. Dauphin (2005) also mentioned that the records might have been unintentional invasions from other regions, and special attention needs to be paid to this taxon with regard to its distribution.

The records from mainland China adopted in Li and Chen (1990, 1993) are highly doubtful, because this species' record locality (Heilongjiang) is inland.

Assing (1995) synonymised *Homalota variolosa* Weise, 1877 with *A. fucicola*, and designated a lectotype for the type series of each species.

Yamazaki (2008) revealed one of the host species of *A. fucicola* as *Fucellia apicalis* Kertész, 1908 (Diptera, Anthomyiidae). Yamazaki (2012) reported that the kelp fly, *Coelopa frigida* (Fabricius, 1805) (Diptera, Coelopidae) was an additional fly host. The article also noted the parasitized months (April, November, December) by *A. fucicola*.



FIGURES 38–45. Terminalia of *Aleochara* (*Emplenota*) *hayamai*. 38. tergite VIII of male; 39. tergite VIII of female; 40. sternite VIII of male; 41. sternite VIII of female; 42. right antenna of male; 43. male genitalia: median lobe of aedeagus in lateral view; 44. male genitalia: median lobe of aedeagus in ventral view; 45. female genitalia: spermatheca.

Aleochara (*Emplenota*) *puetzi* (Assing, 1995)

(Figs. 2, 23–29, 95–96, 103)

Emplenota puetzi Assing, 1995: 220 (diagnostic key to species of Palaearctic *Emplenota*), 225 (original description; type locality: "RUSSIA, Sakhalin, Korsakov distr., Ismenshyroye lake"); Naomi *et al*., 2000: 107 (record from Paramushir Is., Kuril Islands); Paśnik, 2001: 232 (record from North Korea).

Aleochara (*Emplenota*) *puetzi* (Assing, 1995); Maus & Ashe, 1998a (online) (checklist of subgenus of world; phylogenetic relationship); Maruyama, 2002: 18 (record from Japan (Hokkaidô)); Smetana, 2004: 356 (catalogue of Palaearctic Aleocharinae); Frank & Ahn, 2011: 10 (figure of living individual; misidentification of *A. segregata*?), 20 (checklist of coastal Staphylinidae of world).

Type specimens. Not examined.

Non-type specimens. JAPAN: **[Hokkaidô]**: 1 ♂, 1 ♀, Goyômai, Nemuro-shi (43.363N, 145.795E), 14 VI 1999, Ôhara-M. (43°21′47″N, 145°47′43″E; under seaweed; HUM); 1 ♂, 3 ♀, Makkayô-misaki, Habomai, Nemuro-shi (43.339N, 145.747E), 14 VI 1999, Ôhara-M. (43°20′19″N, 145°44′48″E; under seaweed (*Laminaria* sp., *Zostera* sp.); HUM); 2 ♂, 4 ♀, Hamamatsu, Nemuro-shi (43.206N, 145.529E), 26 IX 2000, Maruyama-M. (cMar); 1 ♂, Ochiishi, Nemuro-shi, (43.198N, 145.530E*), 24 VIII 1999, Maruyama-M. (under seaweed on sandy beach; cMar); 1 ♂, 2 ♀, Ochiishihigashi, Nemuro-shi (43.189N, 145.511E), 10 VI 2010 (21:00), Yamamoto-S. (from seaweed (*Zostera* sp.) on sandy beach; cYam); 1 ♂, Ochiishinishi, Nemuro-shi, (43.171N, 145.503E*), 4 V 1995, Nakatani-M. (KUM); 1 ♂, 1 ♀, Mochirippu-numa, Hamanaka-chô, Akkeshi-gun (43.022N, 145.019E), 11 VI 2010, Yamamoto-S. (collected from seaweed (*Laminaria* sp., *Sargassum* sp.) on sandy marsh near coast; cYam); 1 ♀, Shunkunitai, Numuro-shi (43.281N, 145.425E), 24 VIII 2001, Maruyama-M. (cMar); 6 ♂, 1 ♀, Todowara (Notsuke-zaki peninsulae), Notsuke, Betsukai-chô, Notsuke-gun (43.597N, 145.301E*), 6 VII 1986, Nomura-S. (KUM); 1 ♂, 1 ♀, Mokoto, Abashiri-shi (43.970N, 144.322E), 2 VII 1994, Haga-K. (under seaweed; KUM); 2 ♂, 1 ♀, Futatsu-iwa, Abashiri-shi (44.049N, 144.258E*), 6 VI 1989, Katô-T. (KUM); 1 ♂, Kimuaneppu cape, Hamasaroma, Saroma-chô, Tokoro-gun (44.108N, 143.912E), 10 VII 1986, Nomura-S. (KUM); 1 ♀, Komuke-gensei-kaen park, Komukai, Mombetsu-shi (44.296N, 143.441E), 23 VII 2009, Ôhara-M. (44°17′47″N, 143°26′26″E; under seaweed; HUM: HK-09-MO-054/SA); 1 ♀, Chikubetsu, Haboro-chô, Tomamae-gun (44.419N, 141.739E), 22 VII 2009, Ôhara-M. (44°25′09″N, 141°44′22″E; under seaweed (*Laminaria* sp.); HUM: HK-09-MO-046/SA); 3 ♂, Maehama (Teuri-tô), Haboro-chô, Tomamae-gun (44.432N, 141.336E), 14 VI 2008, Ôhara-M. (44°25′55″N, 141°20′08″E; under seaweed; HUM: TE-08-MO-006); 1 ♂, 1 ♀, Aikage (Teuri-tô), Haboro-chô, Tomamae-gun (44.419N, 141.321E), 15 VI 2008, Ôhara-M. (44°25′07″N, 141°19′16″E; under seaweed; HUM: TE-08-MO-007); 1 ♂, 1 ♀, Ayoro cape, Kojôhama, Shiraoi-chô, Shiraoi-gun (42.453N, 141.206E), 27 VIII 2009, Ôhara-M. (N42°27′11″, E141°12′21″; under seaweed (*Sargassum* sp., *Laminaria* sp.), eel grass (*Zostera* sp.); HUM: HK-09-MO-092/RO, SA); 1 ♀, Yamasedomari (Okushiri-tô), Okushiri-chô, Okushiri-gun (42.201N, 139.540E), 12 VII 2008, Ôhara-M. (42°12′03″N, 139°32′24″E; under seaweed; HUM: OK-08-MO-018); 1 ♀, Okushiri (Okushiri-tô), Okushiri-gun (42.170N, 139.517E), 12 VII 2008, Ôhara-M. (42°10′12″N, 139°31′00″E; under seaweed; HUM: OK-08-MO-014); 1 ♂, Tomisato (Okushiri-tô), Okushiri-chô, Okushiri-gun (42.072N, 139.471E), 12 VII 2008, Ôhara-M. (42°04′18″N, 139°28′17″E; under seaweed; HUM: OK-08-MO-015); 3 ♀, Hakodate-shi (41.760N, 140.693E*), 13 V 1971, Hirano-Y. (KUM); 1 ♀, Esan-misaki, Esanmisaki-chô, Hakodate-shi (41.812N, 141.183E), 15 VII 2009, Ôhara-M. (41°48′42″N, 141°10′59″E; under seaweed (*Laminaria* sp.); HUM: HK-09-MO-042/CO); 1 ♀, Tachimachi-misaki, Sumiyoshi-chô, Hakodate-shi (41.745N, 140.721E*), 15 IX 2008, Nishikawa-M (KUM); 3 ♀, Shirakami-misaki, Shirakami, Matsumae-chô, Matsumae-gun (41.398N, 140.199E*), 12 VII 2009, Ôhara-M. (42°23′52″N, 140°11′56″E: mistyping?; under seaweed (*Sargassum* sp.); HUM: HK-09-MO-033/SI).

Other specimens. RUSSIA: **Kuril Islands**: [**Paramushir Is.**]: 5 ♂, 5 ♀, Medvezhiy Waterfall, Shelekhovo (50.367N–50.378N, 155.611E–155.656E), 18 VII 1997, Saitô-A. (50°22.012′N–50°22.694′N, 155°36.677′E–155°39.380′E; alt. 0–10m; CBM: CBM-ZI 81521(-81530)); 1 ♀, Brynkhanovo bay, south end of the island (50.021N, 155.405E), 1 VIII 1996, Ôhara-M. (50°01′17″N, 155°23′79″E; by hand pick up; under seaweed; IKIP; HUM). [**Urup Is.**]: 1 ♂, 1 ♀, Vesetaya river near mouth of Natally bay (46.094N, 150.142E), 6 VIII 1995, Ôhara-M. (46°05′38″N, 150°08′33″E; by hand pick up; IKIP; HUM: UR-95-MO-006); 1 ♀, same data, but 7 VIII 1995, (IKIP: without collection number); 1 ♀, environs of Vstrechnyi river, inland coastal margin of Negodnaya Bay (45.951N, 150.181E), 29 VIII 1995 (14:30–16:30), Ôhara-M. (45°56′63″N, 150°10′52″E; by hand with

aspirator; alt. 1m; under seaweed along sandy coast line; IKIP; HUM: UR-95-MO-070); 1 ♀, Otkrytyybay (45.864N, 149.793E), 4 VIII 1995, Ôhara-M. (45°51′49″N, 149°46′95″E; by hand pick up; under logs and rocks on shore; IKIP; HUM: UR-95-MO-002); 1 ♀, same data, but (45.851N, 149.770E), 5 VIII 1995, (N45°51′04″, E149°46′12″; under seaweed along seashore; IKIP; HUM: UR-95-MO-005).

Redescription. Body (Fig. 2): small to relatively large sized, normally medium sized; somewhat robust, narrowly elongated; surface of pronotum and elytra covered with numerous short hairs rather densely; distinct but inconspicuous punctures on dorsal surface of head and pronotum, and shallow distinct punctures on elytra. **Colour** (Fig. 2): gland colour blackish brown to dark gray; legs, especially tarsal segments, brown to reddish brown: maxillary and labial palpi blackish brown to yellowish brown; antennae blackish brown and partly reddish brown. **Head**: top of dorsal surface flattened, without unique elevation; surface sparsely covered with short setae. **Antennae**: thick and robust; slightly shorter than combined length of head and pronotum; segment I, nearly 2.6 times as long as broad; segment II clearly shorter than I; segment III as same length as II; segments IV and V somewhat spherical, as long as width; segments VI to X clearly transverse; segment XI thick and subconical with rounded apical margin, 1.2 times as long as broad; relative length (width) of segments from basal to apical: 9(3.5): 5(3): 5(3): 3(3): 3(3.5): 2.5(4): 3(5): 3 (5): 3(5): 3(5): 6(5). **Thorax**: pronotum relatively wider than long (PW/PL =1.26), a little broader than head (PW/HW =1.36); surface with minute hexagonal reticulations and inconspicuous distinct punctures. Metaventrite, about 1.6 times as long as mesoventrite. Inter coxal process of mesoventrite sharply pointed, but with rounded apex, and having short carina along midline, about 0.4 times as long as mesoventrite. Inter coxal process of metaventrite broad and short, one third as long as mesocoxal cavity. **Legs**: hindtibia short, 0.9 times as long as elytra; relative lengths of tarsomeres from basal to apical: 5: 4.5: 4.5: 4.5: 10.5 in foretarsus, 7.5: 6: 5: 5: 13.5 in midtarsus, 9: 7: 7: 7.5: 16 in hindtarsus.

[Male]: posterior margin of tergite VIII (Fig. 23) nearly truncate, with around 8 macrosetae. Sternite VIII (Fig. 25) with about 7 macrosetae and around 12 thin macrosetae; posterior margin pointed somewhat strongly. Median lobe of aedeagus (Figs. 27–28) elongated and narrowed toward apex, elongated pyriform in ventral view (Fig. 28); a pair of subapico-ventral projections almost straight and somewhat robust in lateral view (Fig. 27); basal swelling of aedeagus (bs), pointed sharply toward foramen mediale in lateral view (Fig. 27); apical lobe clearly isosceles shape in ventral view (Fig. 28); flagellum much shorter than the whole length of median lobe (Figs. 27–28); apical part of copulatory piece sclerotized traiangularly in lateral view (Fig. 27).

[Female]: tergite VIII (Fig. 24) moderately rounded toward posterior, with around 7 macrosetae. Sternite VIII (Fig. 26) with 8 macrosetae, but thickness of macrosetae varying within species; posterior margin slightly pointed but much weaker than male. Spermatheca (Fig. 29): spermathecal head longer than spermathecal neck (sn); basal portion of spermathecal stem narrowing towards base, with bent around middle, sometimes at base; sclerotized portion of spermathecal stem erect; each part of spermatheca except for membraneous portion of spermathecal duct (sm) entirely and moderately sclerotized; (sm) moderate in length.

Measurements (male: n=10): BL, 3.29–4.65 (3.77±0.44); FBL, 1.76–2.28 (2.02±0.17); HL, 0.52–0.74 (0.64±0.07); HW, 0.61–0.79 (0.69±0.06); AL, 0.97–1.33 (1.17±0.10); PL, 0.66–0.85 (0.74±0.07); PW, 0.82–1.05 (0.92±0.08); EL, 0.66–0.89 (0.75±0.09); EW, 0.92–1.35 (1.15±0.12); HTL, 0.48–0.78 (0.67±0.09).

Measurements (female: n=10): BL, 3.20–4.73 (4.01±0.51); FBL, 1.81–2.43 (2.10±0.18); HL, 0.50–0.77 (0.62±0.08); HW, 0.59–0.81 (0.69±0.07); AL, 0.99–1.18 (1.08±0.07); PL, 0.63–0.84 (0.74±0.08); PW, 0.84–1.07 (0.95±0.08); EL, 0.58–0.82 (0.72±0.07); EW, 0.86–1.37 (1.18±0.16); HTL, 0.52–0.79 (0.64±0.07).

Diagnosis. This species is similar to the other Japanese *Emplenota* species, but can be distinguished from them by the following points: varying from small to large size (not extremely large); distribution (see, Fig. 103) restricted to northern region (Hokkaidô, Japan; Russian Far East; North Korea); punctures on dorsal surface of head, pronotum and elytra inconspicuous (Fig. 2); impunctured area of head flattened; antennae thick; metaventrite, about 1.62 times as long as mesoventrite of which with short carina, about 0.37 times as long as mesoventrite. [**Male**]: sternite VIII (Fig. 25) somewhat strongly pointed toward posterior margin; apex of sclerite inside the median lobe, triangularly sclerotized in lateral view (Fig. 27); subapico-ventral projections on median lobe clearly straight in lateral view (Fig. 27); basal swelling of median lobe, sharply pointed toward ventral margin in lateral view (Fig. 27). [**Female**]: basal portion of spermathecal stem with bent around middle part (Fig. 29), and with erect sclerotized portion of spermathecal stem.

Confirmed distribution by authors. [**JAPAN**]: Hokkaidô, Teuri-tô, Okushiri-tô (See, Fig. 103); [**RUSSIA**]: Kuril Islands: Paramushir Is., Urup Is.

Other localities in literature. [**RUSSIA**]: Far East: Sakhalin, Kamchatka Peninsula, Primorsky Krai (Assing, 1995); [**NORTH KOREA**]: Chagang Province (Paśnik, 2001).

Remarks. *Aleochara puetzi* was originally described from Russian territory by Assing (1995). The results of the Biological Expedition of the Natural History Museum and Institute, Chiba, Japan, to the North Kuril Islands provided us with the distributional information of this species, and other records of the species come from Paramushir Island (of the Kuril Islands) (Naomi *et al*., 2000). Here, we present the first record from Urup Island from this same island group. These specimens were collected in Russia under the survey of the International Kuril Island Project (IKIP), which is an international collaboration of American, Russian, and Japanese scientists to survey the fauna and flora of the Kuril Archipelago (Takahashi & Ôhara, 2004).

Paśnik (2001) reported this species from North Korea, and later Maruyama (2002) recorded it for the first time from Japan (northeastern part of Hokkaidô). Park and Ahn (2004) recorded *A. puetzi* from South Korea and also corrected the misidentification of this species reported as "*A. fucicola*" in the previous paper (Ahn *et al*., 2000). However, the identification of the species in both papers is incorrect, and we consider it a new species (*A. segregata*) according to their illustrations.

Aleochara (*Emplenota*) *segregata* Yamamoto & Maruyama n. sp.

(Figs. 5, 30–37, 93–94, 97, 102)

"*Aleochara* (*Emplenota*) *fucicola* Sharp, 1874"; Ahn *et al*., 2000: 243 (diagnosis with figures; later regarded as misidentification of "*A. puetzi*" by Park & Ahn, 2004, but actually misidentification of *A. segregata*; re-examination of specimens is needed).

"*Aleochara* (*Emplenota*) *puetzi* Assing, 1995"; Park & Ahn, 2004: 195 (key to littoral *Aleochara* species of Korea), 196 (redescription, but misidentification of *A. segregata*; re-examination of specimens is needed).

Type series. Holotype, ♂, **JAPAN**: Ikinomatsubara-1chôme, Nishi-ku, Fukuoka-shi, Fukuoka-ken, Kyûshû (33.580N, 130.293E), 28 VI 2009, Yamamoto-S. (collected by an aspirator; from drafted seaweed on fine sandy beach in day time; KUM).

Paratypes, **JAPAN**: **[Hokkaidô]**: 1 ♀, Matue (Okushiri-tô), Okushiri-chô, Okushiri-gun (42.072N, 139.471E), 12 VII 2008, Ôhara-M. (42°04′18″N, 139°28′17″E; under seaweed; 5 ♂, 6 ♀, Sawara, Mori-machi, Kayabe-gun (42.123N, 140.647E), 15 VII 2009, Ôhara-M. (42°07′23″N, 140°38′50″E; under seaweed (*Sargassum* sp.); HUM: HK-09-MO-040/SA); HUM: HK-09-MO-032/SA); 2 ♂, Esashi-chô, Hiyama-gun (41.857N, 140.125E*), 4 VI 1977, Nishikawa-N. (KUM); 1 ♀, Hakodate-shi (41.760N, 140.693E*), 13 V 1971, Hirano-Y. (KUM); 1 ♂, 1 ♀, Hon-chô, Kikonai-chô, Kamiiso-gun (41.676N, 140.439E), 12 VII 2009, Ôhara-M. (41°40′33″N, 140°26′22″E; under seaweed (*Laminaria* sp., *Sargassum* sp.) and eel grass (*Zostera* sp.); HUM: OK-08-MO-015). **[Honshû]**: 1 ♂, Rikuchû-Yagi, Taneichi, Hirono-chô, Kunohe-gun (40.349N, 141.764E), 28 VI 2010, Ôhara-M. (40°20′56″N, 141°45′49″E; under seaweed (*Laminaria* sp., *Sargassum* sp.) and eel grass (*Zostera* sp.) on sandy beach: HUM: HN-10-MO-044/SA); 2 ♀, Raga, Tanohata-mura, Shimohei-gun, Iwate-ken (39.939N, 141.940E*), 30 V 1998, Watanabe-T. (cWat); 1 ♂, Jôdoga-hama, Hitachihama-chô, Miyako-shi, Iwate-ken (39.649N, 141.981E), 29 V 1998, Watanabe-T. (cWat); 3 ♀, Isohara, Kitaibaraki-shi, Ibaraki-ken (36.790N, 140.752E), 24 V 1998, Ohmomo-S. (KUM); 1 ♂, Majima, Murakami-shi, Niigata-ken (38.273N, 139.449E*), 5 V 2000, no collector's name (KUM); 1 ♀, Benten-misaki (Sadoga-shima), Higashikowashimizu, Sado-shi, Niigata-ken (38.008N, 138.546E), 4 V 1998, Kinoshita-T. (cWat); 1 ♂, same data, 5 V 1998, Tsuyuki-S. (cWat); 1 ♂, Hamaogi-kaigan, Hamaogi, Kamogawa-shi, Chiba-ken (35.118N, 140.144E), 24 IV 1990, Takeda-T. (KUM); 1 ♂, 1 ♀, same data, but 6 IV 1993; 2 ♂, 1 ♀, Heisaura, Sakai, Tateyama-shi, Chiba-ken (34.948N, 139.801E), 1 IV 1997, Maruyama-M. (cMar); 1 ♀, Shinmaiko-hama, Yawata, Futtsu-shi, Chiba-ken (35.250N, 139.866E), 11 VI 1995, Emoto-K. (cWat); 5 ♂, 4 ♀, Shibasaki-bashi bridge, Kanaya, Futtsu-shi, Chiba-ken (35.174N, 139.819E), 14 VI 2009, Ono-H. (cOno); 1 ♂, 1 ♀, Kaneda swimming beach, Kaneda, Minamishitaura-machi, Miura-shi, Kanagawa-ken (35.167N, 139.660E), 19 III 2001, Watanabe-T. (cWat); 2 ♂, 2 ♀, Jôgashima (Jôga-shima), Misaki-machi, Miura-shi, Kanagawa-ken (35.132N, 139.621E), 10 IV 2003, Watanabe-T. (cWat); 1 ♀, Mito beach, Hasse-machi, Miura-shi, Kanagawa-ken (35.177N, 139.620E), 29 V 2007, Watanabe-T. (cWat); 5 ♂, 4 ♀, same data, but 5 VI 2007; 1 ♂, 1 ♀, same data, but 14 V 2009 (collected with *Aleochara* (*E.*) *hayamai*); 3 ♂, 1 ♀, same data, but 12 VI 2009; 3 ♂, 1 ♀, Arasaki, Nagai, Yokosuka-shi, Kanagawa-ken (35.194N, 139.600E*), 12 VI 2009,

Watanabe-T. (cWat); 1 ♂, 3 ♀, Shônan-kaigan, Kanagawa-Ken (35.315N, 139.351E*), 2 VII 1976, Niizato (KUM); 1 ♂, Eno-shima, Fujisawa-shi, Kanagawa-ken (35.300N, 139.485E*), 11 VI 2001, Watanabe-T. (cWat); 1 ♂, 3 ♀, Mitsuishi, Manazuru, Manazuru-shi, Ashigarashimo-gun, Kanagawa-ken (35.138N, 139.163E), 15 VII 1989, Watanabe-T. (cWat); 2 ♂, Shira-hama, Shirahama, Shimoda-shi, Shizuoka-ken (34.689N, 138.973E), 13 III 1989, Oda-H. (KUM); 33 ♂, 18 ♀, Tsumeki-zaki, Shimoda-shi, Shizuoka-ken (34.659N, 138.987E), 21 IV 2003, Maruyama-M. (cMar); 1 ♂, 1 ♀, river mouth of Kushida-gawa, Matsunase-chô, Matsuzaka-shi, Mie-ken (34.605N, 136.581E), 29 IV 2002, Kawakami-Y. (cKaw); 1 ♂, Maizuru, Kyôto-fu (35.514N, 135.387E*), 3 V 1980, Hayashi-Y. (cHayas); 1 ♂, Shimakage, Miyazu-shi, Kyôto-fu (35.576N, 135.250E*), 31 III 2000, Yasukawa-K. (KUM); 1 ♀, Shionomisaki, Kushimoto-chô, Higashimuro-gun, Wakayama-ken (33.445N, 135.756E*), 17 V 1964, Yasui-M. (cHayas); 1 ♀, Kada-kaigan, Kada, Wakayama-shi, Wakayama-ken (34.280N, 135.074E), 4 IX 2003, Wada-T. (KUM); 1 ♀, Niriga-hama, Isonoura, Wakayama-shi, Wakayama-ken (34.259N, 135.094E), 15 V 2007, Kawakami-Y. (cKaw); 1 ♀, river mouth of Ashiya-gawa, Minamihama-chô, Ashiya-shi, Hyôgo-ken (34.708N, 135.309E), 27 V 1998, Kawakami-Y. (cKaw); 1 ♂, Sumaura-kaigan, Sumauradôri, Suma-ku, Kôbe-shi, Hyôgo-ken (34.637N, 135.103E), 16 VI 1998, Kawakami-Y. (cKaw); 1 ♀, same data, but 15 IV 2004; 4 ♂, same data, but 27 V 2010; 2 ♂, 1 ♀, Maiko-hama, Tarumi-ku, Kôbe-shi, Hyôgo-ken (34.638N, 135.027E), 16 VI 1998, Kawakami-Y. (cKaw); 2 ♂, Nada-kaigan (Awaji-shima), Nada, Minamiawaji-shi, Hyôgo-ken (34.207N, 134.812E*), 1 IV 1977, Kaneda (KUM); 1 ♀, same locality, but 3 X 1972, Tomokuni-M. and Sakai-M. (EEEU); 1 ♂, Gunge-hama (Awaji-shima), Gunge, Awaji-shi, Hyôgo-ken (34.475N, 134.845E), 5 V 2000, Kawakami-Y. (cKaw); 2 ♂, 1 ♀, Sumoto coast (Awaji-shima), Sumoto-shi, Hyôgo-ken (34.343N, 134.902E*), 23 V 1998, Kawakami-Y. (cKaw); 1 ♀, river mouth of Akashi-gawa, Akashi, Akashi-shi, Hyôgo-ken (34.644N, 134.975E), 9 IV 2002, Kawakami-Y. (cKaw); 1 ♀, Yagi, Ôkubo-chô, Akashi-shi, Hyôgo-ken (34.670N, 134.933E), 9 V 1999, Kawakami-Y. (cKaw); 1 ♂, Matogata beach, Matogata, Matogata-chô, Himeji-shi, Hyôgo-ken (34.769N, 134.746E), 16 V 2010, Kawakami-Y. (KUM); 1 ♂, Fukudomari, Matogata-chô, Himeji-shi, Hyôgo-ken (34.769N, 134.737E), 2 VI 2000, Kawakami-Y. (cKaw); 1 ♀, Shirahama, Shirahama-chô, Himeji-shi, Hyôgo-ken (34.777N, 134.708E), 2 VI 2000, Kawakami-Y. (cKaw); 1 ♂, 3 ♀, river mouth of Chigusa-gawa, Onzaki, Akô-shi, Hyôgo-ken (34.731N, 134.393E), 15 VI 1999, Kawakami-Y. (cKaw); 1 ♂, 1 ♀, Kugui, Higashi-ku, Okayama-shi, Okayama-ken (34.584N, 134.086E*), 31 III 2003, Fujitani-Y. (KUM); 5 ♂, 2 ♀, same data, but 9 V 2003 (under seaweed on beach); 3 ♂, 2 ♀, same data, but 28 V 2003; 1 ♂, Inazumi, Sugeura, Mihonoseki-chô, Matue-shi, Shimane-ken (35.564N, 133.166E*), 1-2 VI 2008, Hayama-T. (sandy beach; cHayam); 2 ♂, Okidomari, Tako, Shimane-chô, Matue-shi, Shimane-ken (35.604N, 133.096E*), 3 VI 2008, Hayama-T. (from seaweed; cHayam); 2 ♂, Konami-kaigan, Nonami, Shimane-chô, Matue-shi, Shimane-ken (35.588N, 133.098E), 6 V 2008, Hayama-T. (cHayam); 1 ♀, Kakanokuketo, Shimane-chô, Matsue-shi, Shimane-ken (35.578N, 133.050E), 9 VI 2009, Hayama-T. (cHayam); 1 ♀, same data, but 19 VII 2010, Yamamoto-S. (shingle beach; under flotsom; cYam); 41 ♂, 56 ♀, Koura-kaigan, Koura, Kashima-chô, Matue-shi, Shimane-ken (35.5201N, 132.975E), 8-10 VI 2009, Hayama-T. (FIT; cHayam); 2 ♀, same data, but 3-5 VII 2009; 12 ♂, 36 ♀, same data, but 18-20 VI 2009; 1 ♂, 1 ♀, same data, but 16-18 VII 2009; 3 ♂, 1 ♀, same locality, but 17 VII 2010, Yamamoto-S. (under flotsam on sandy beach; cYam); 1 ♂, same data, but 18 VII 2010; 2 ♀, Sakaura-kaigan, Sakaura-chô, Izumo-shi, Shimane-ken (35.508N, 132.861E), 4 VII 2008, Hayama-T. (shingle beach with shore reefs; cHayam); 1 ♂, same data, but 15 IV 2009 (from seaweed); 1 ♂, 4 ♀, same data, but 20 IV 2009; 1 ♂, river mouth of Sakaura-gawa, Sakaura-chô, Izumo-shi, Shimane-ken (35.508N, 132.861E), 24 III 2009, Hayama-T. (shingle beach; cHayam); 1 ♂, river mouth of Mitsu-gawa, Mitsu-chô, Izumo-shi, Shimane-ken (35.498N, 132.826E), 30 IV 2008, Hayama-T. (cHayam); 2 ♀, river mouth of Inome-gawa, Inome-chô, Izumo-shi, Shimane-ken (35.441N, 132.710E), 21 III 2008, Hayama-T. (shingle beach; cHayam); 5 ♂, Owashi-hama, Nakayama, Taisha-chô, Izumo-shi, Shimane-ken (35.433N, 132.634E), 10 IV 2009, Hayama-T. (cHayam); 2 ♂, Akaishihana, Hinomisaki, Taisha-chô, Izumo-shi, Shimane-ken (35.411N, 132.650E*), 2 IV 2009, Hayama-T. (cHayam); 2 ♂, same data, but 2-8 V 2009 (FIT; cHayam); 1 ♀, Sotozono-kaigan, Sashiumi, Koryô-chô, Izumo-shi, Shimane-ken (35.333N, 132.664E), 12-13 IV 2009, Hayama-T. (YPT; cHayam); 2 ♂, Kumura-kaisuiyokujô swimming beach, Kumura, Taki-chô, Izumo-shi, Shimane-ken (35.296N, 132.637E), 5 X 2008, Hayama-T. (cHayam); 2 ♂, 1 ♀, Kumura, Taki-chô, Izumo-shi, Shimane-ken (35.296N, 132.637E*), 18 IV 2009, Hayama-T. (cHayam); 1 ♂, Kuchitaki, Taki-chô, Izumo-shi, Shimane-ken (35.271N, 132.581E), 18 IV 2009, Hayama-T. (cHayam); 1 ♂, 1 ♀, Iwami-kaigan, Kushiro-chô, Hamada-shi, Shimane-ken (34.955N, 132.127E*), 16-17 VI 2008, Hayama-T. (YPT; cHayam); 1 ♂, 1 ♀, Kiami-chô, Masuda-shi, Shimane-ken (34.676N, 131.750E*), 15 VI 2008, Hayama-T. (cHayam); 2 ♂, 1 ♀, same data, but 15-16 VI

2008 (FIT); 1 ♂, 1 ♀, same data, but 10 V 2009; 7 ♀, same data, but 10-11 V 2009 (FIT); 7 ♂, 11 ♀, Yoshimi, Shimonoseki-shi, Yamaguchi-ken (34.064N, 130.905E*), 1 VI 1980, Naomi-S.I. (KUM). **[Shikoku]**: 3 ♂, 5 ♀, Ariake-hama, Muromoto-chô, Kanonji-shi, Kagawa-ken (34.139N, 133.642E), 9 IV 2011, Fujimoto-H. (sandy beach; KUM); 21 ♂, 10 ♀, Iwagi (Akahone-jima), Kamijima-chô, Ochi-gun, Ehime-ken (34.234N, 133.159E*), 2 V 2009, Satô-Y. (EEEU); 3 ♀, same locality, but 7 V 2009, Senda-Y. (EEEU); 1 ♀, Hôjôtsuji, Matsuyama-shi, Ehime-ken (33.974N, 132.770E), 16 VI 2008, Senda-Y. (EEEU). **[Kyûshû]**: 3 ♂, 4 ♀, Watari, Fukutsu-shi, Fukuoka-ken (33.786N, 130.454E), 21 IV 2012, Yamamoto-S., Maruyama-M., Kanao-T. (from seaweed on small sandy beach with *Aleochara* (*Triochara*) *trisulcata*; KUM); 4 ♂, 6 ♀, Watari, Fukutsu-shi, Fukuoka-ken (33.790N, 130.447E), 21 IV 2012, Yamamoto-S., Maruyama-M., Kanao-T. (from seaweed on huge sandy beach with *A.* (*T.*) *trisulcata*; KUM); 1 ♀, Mitoma, Higashi-ku, Fukuoka-shi, Fukuoka-ken (33.703N, 130.417E), 3 VI 2001, Ogata-S. (KUM); 2 ♂, 1 ♀, Shikano-shima, Higashi-ku, Fukuoka-shi, Fukuoka-ken (33.675N, 130.312E*), 24 VIII 1980, Naomi-S.I. (KUM); 3 ♂, 1 ♀, Shimomaga-hama, Katsuma, Higashi-ku, Fukuoka-shi, Fukuoka-ken (33.684N, 130.290E), 15 V 2011 (11:30), Yamamoto-S. (seaweed on sandy beach together with *A.* (*T.*) *trisulcata*; cYam); 25 ♂, 56 ♀, same data, but 9 VII 2011 (15:00-16:00; from seaweed and flotsam on beach); 28 ♂, 39 ♀, same data, but 21 III 2012 (14:00); 3 ♂, 7 ♀, Odo-kôen park, Odo-2chôme 6, Nishi-ku, Fukuoka-shi, Fukuoka-ken (33.596N, 130.311E), 28 VI 2009, Yamamoto-S. (from decaying seaweed along sandy seashore; cYam); 24 ♂, 26 ♀, Ikinomatsubara-1chôme, Nishi-ku, Fukuoka-shi, Fukuoka-ken (33.580N, 130.293E), 28 VI 2009, Yamamoto-S. (from seaweed on sandy beach; same data as holotype; cYam); 3 ♂, 6 ♀, Noko (Nokono-shima), Nishi-ku, Fukuoka-shi, Fukuoka-ken (33.608N, 130.299E), 20 III 2009, Yamamoto-S. (from a seaweed mass on sandy beach with *A.* (*T.*) *trisulcata* and *A.* (*T.*) *zerchei*; cYam]; 1 ♀, Hongô (Sakito-jima), Sakito-chô, Saikai-shi, Nagasaki-ken (33.003N,129.550E*), 23 X 1977, Imasaka-S. (KUM). **[Ryûkyû]**: 1 ♀, Nakatane-chô (Tanega-shima), Kumage-gun, Kagoshima-ken (30.515N, 130.980E), 8-13 V 1996, Maruyama-M. (cMar).

Description. Body (Fig. 5): medium to relatively large size, normally medium sized. Uniformly densely haired except for head along midline; surface of pronotum and elytra covered with numerous somewhat long hairs densely; head, pronotum and elytra with distinct punctures on dorsal surface densely. **Colour** (Fig. 5): gland colour blackish brown to dark gray; legs, especially tarsal segments, reddish brown to dark brown: maxillary and labial palpi reddish brown to yellowish brown; antennae blackish brown and partly reddish brown. **Head**: head capsule somewhat rectangle; surface entirely rather flattened, but impunctured area along midline longitudinally swollen (weakly carinate); surface sparsely covered with thin and somewhat long setae except for swollen area; uniformly observed comparatively large hexagonal reticulations on dorsal surface. **Antennae**: moderately thick and long; segment I, nearly 2.1 times as long as broad; segment II clearly shorter than I; segment III as same length as II; segment IV spherical or short barrel shape, as long as width; segments V and VI short barrel shape; sebments VII to X clearly transverse; segment XI, about 1.6 times as long as broad; relative length (width) of segments from basal to apical: 10.5(5): 7(4): 7(4): 4(4): 4.5(5): 4.5(5): 4(5): 3.5(5): 4(6): 4.5(6): 9(5.5). **Thorax**: pronotum somewhat wider than long (PW/PL =1.24), a little broader than head (PW/HW =1.36); surface mat with large hexagonal reticulations with somewhat shallow distinct punctures. Metaventrite, about 1.5 times as long as mesoventrite. Apex of inter coxal process of mesoventrite sharply pointed with very short and inconspicuous carina along midline, about 0.3 times as long as mesoventrite. Inter coxal process of metaventrite very broad and short, less than one third as long as mesocoxal cavity, and rounded apically. **Legs**: relative lengths of tarsomeres from basal to apical: 5.5: 3: 4.5: 4.5: 10.5 in foretarsus, 7.5: 5.5: 5.5: 5.5: 13.5 in midtarsus, 9.5: 6.5: 6.5: 7.5: 16.5 in hindtarsus.

[Male]: outer margin of tergite VIII (Fig. 30) nearly truncate, with around 7 macrosetae. Sternite VIII (Fig. 32) with about 5 macrosetae and around 10 thin macrosetae; posterior margin strongly pointed with rounded apex. Median lobe of aedeagus (Figs. 34–35) elongated and slightly narrowing toward apex in lateral view (Fig. 34), subparallel sided in ventral view (Fig. 35); a pair of subapico-ventral projections gently curved in lateral view (Fig. 34); basal swelling of aedeagus, circularly pointed in lateral view (Fig. 34); apical lobe short and abruptly narrowing toward apex in ventral view (Figs. 35–36); flagellum clearly shorter than the whole length of median lobe (Figs. 34–35).

[**Female**]: tergite VIII (Fig. 31) with moderately rounded margin, with around 7 macrosetae. Sternite VIII (Fig. 33) with about 7 macrosetae; posterior margin slightly pointed. Spermatheca (Fig. 37): entirely thick; spermathecal head about two to three times longer than apical portion of spermathecal stem; spermathecal neck shorter than (sh); basal portion of spermathecal stem short, slightly narrowing toward base, lacking any bent around middle and base;

lack of sclerotized portion of spermathecal stem; each part of spermatheca entirely and moderately sclerotized except for membraneous portion of spermathecal duct (sm); (sm) moderate in length.

Measurements (male: n=10): BL, 3.28–4.96 (4.11±0.58); FBL, 1.57–2.35 (1.92±0.23); HL, 0.44–0.66 (0.55±0.08); HW, 0.52–0.71 (0.62±0.06); AL, 0.95–1.23 (1.13±0.09); PL, 0.56–0.78 (0.68±0.07); PW, 0.71–1.00 (0.86±0.09); EL, 0.57–0.84 (0.67±0.08); EW, 0.93–1.27 (1.11±0.12); HTL, 0.53–0.75 (0.63±0.07).

Measurements (female: n=10): BL, 3.25–4.63 (4.18±0.49); FBL, 1.64–2.15 (1.92±0.16); HL, 0.42–0.65 (0.57±0.07); HW, 0.56–0.71 (0.64±0.05); AL, 0.92–1.26 (1.10±0.10); PL, 0.60–0.80 (0.70±0.06); PW, 0.75–0.99 (0.85±0.07); EL, 0.56–0.85 (0.70±0.09); EW, 0.96–1.22 (1.12±0.09); HTL, 0.54–0.72 (0.63±0.06).

Distribution. [**JAPAN**]: Hokkaidô, Honshû, Shikoku, Kyûshû, northern Ryûkyû, Okushiri-tô, Sadoga-shima, Awaji-shima, Tanega-shima. See, Fig. 102.

Other localities in literature. [**SOUTH KOREA**]: Gangwon (Kangwon) Province, Chungnam Province, Gyeongnam Province, Jeonnam Province, Jeju Province (Ahn *et al*., 2000; Park & Ahn, 2004; both as "*A. puetzi*"; re-examinations are needed).

Diagnosis. This new species is similar to the other species, especially *A. fucicola* and *A. puetzi*, also in male genitalia. We found several distinguishable character states from other *Emplenota* species below: varying from medium to relatively large size (not very small or very large); entire body pubescent with weak but dense punctures on dorsal surface of head, pronotum and elytra (Fig. 5); impunctured area along midline of head longitudinally and prominently swollen above, forming carina, but other areas flattened compared to *A. fucicola*; antennae relatively thick and robust, with short barrel or spherical shape of segment IV; mesoventrite with quite short carina, about 0.27 times as long as mesoventrite; inter coxal cavity of mesoventrite sharply pointed. [**Male**]: sternite VIII (Fig. 32) strongly pointed with rounded apex; subapico-ventral projections on median lobe gently rounded in lateral view (Fig. 34); median lobe subpararell sided in ventral view (Fig. 35); apex of median lobe short in lateral view (Fig. 34); apical lobe isosceles shape, but narrowing abruptly at base in ventral aspect (Figs. 35–36): basal portion of median lobe pointed oblongly, towards to ventral margin of median lobe in lateral aspect (Fig. 34). [**Female**]: spermatheca (Fig. 37) quite thick and wide, without erect and sclerotized stem (ss).

Etymology. The species is named after the Latin adjective *segregatus* meaning separated. Because of the close similarity of the external appearances among *A. segregata*, *A. fucicola*, and *A. puetzi*, some researchers have often confused these taxa (e.g., Ahn *et al*., 2000; Park & Ahn, 2004).

Remarks. This new species is very similar to *Aleochara* (*Emplenota*) *fucicola* and *A.* (*E.*) *puetzi* in general appearance. Therefore, the species has generated some problems regarding the taxonomy of *Emplenota* species occurring in adjacent regions of Japan (see, remarks for *A. fucicola* and *A. puetzi*).

Carina like longitudinal elevation on the dorsal surface of the head characterises this species in morphology, but observation under a microscope is needed to confirm the character state.

The species has a wide-ranging distribution in Japan, from the northern (Hokkaidô) to the southern islands (Tanega-shima, northern Ryûkyû). In addition, this species may be the most common *Emplenota* species in Japan, because large numbers of specimens have been collected by many researchers. Previous records of the Asian *Emplenota* specimens need to be reexamined to be confirmed, especially those recorded from China and the Korean peninsula.

Aleochara (*Emplenota*) *hayamai* Yamamoto & Maruyama n. sp.

(Figs. 3, 38–45, 93–94, 97, 103)

Type series. Holotype, ♂, **JAPAN**: Koura-kaigan, Koura, Kashima-chô, Matue-shi, Shimane-ken, Honshû (35.521N, 132.975E), 18 VII 2010, Yamamoto-S. (by hand with aspirator; under flotsam on sandy beach in the hot daytime; KUM).

Paratypes, **JAPAN**: **[Honshû]**: 2 ♂, Mito beach, Hasse-machi, Miura-shi, Kanagawa-ken (35.177N, 139.620E), 14 V 2009, Watanabe-T. (cWat); 1 ♂, Inugu (Dôgo Is., Oki-shotô), Okinoshima-chô, Oki-gun, Shimane-ken (36.219N, 133.372E*), 10 XI 2009, Hayama-T. (cHayam); 4 ♂, 3 ♀, Kakanokuketo, Shimane-chô, Matsue-shi, Shimane-ken (35.578N, 133.051E), 1 IV 2009, Hayama-T. (shingle beach; cHayam); 2 ♂, 2 ♀, same data, but 9 VI 2009; 2 ♂, same data, but 18 VII 2010, Yamamoto-S. (cYam); 1 ♂, same data, but 19 VII 2010; 1 ♂, Kaka (Katsura-jima), Shimane-chô, Matsue-shi, Shimane-ken (35.566N, 133.052E), 19 VII 2010, Yamamoto-S.

(by hand pick; sandy beach; under seaweed around evening; cYam); 18 ♂, 4 ♀, Koura-kaigan, Koura, Kashima-chô, Matue-shi, Shimane-ken (35.521N, 132.975E), 8-10 VI 2009, Hayama-T. (FIT; cHayam); 31 ♂, 26 ♀, same data, but 18-20 VI 2009; 3 ♂, same data, but 3-5 VII 2009; 4 ♂, 8 ♀, same data, but 16-18 VII 2009; 8 ♂, 4 ♀, same data, but 17 VII 2010, Yamamoto-S. (by hand pick up with aspirator; under flotsam on sandy beach; KUM); 1 ♂, 2 ♀, same data, but 18 VII 2010 (same data as holotype); 2 ♂, Sakaura-kaigan, Sakaura-chô, Izumo-shi, Shimane-ken (35.508N, 132.861E), 20 IV 2009, Hayama-T. (cHayam); 1 ♀, same data, but 15 V 2009; 1 ♀, river mouth of Sakaura-gawa, Sakaura-chô, Izumo-shi, Shimane-ken (35.508N, 132.861E), 13 IV 2008, Hayama-T. (cHayam); 1 ♂, same data, but 31 IV 2008; 1 ♂, same data, but 17 V 2008; 1 ♂, 31 VIII 2008; 1 ♂, same data, but 5 VIII 2009; 2 ♂, 1 ♀, Owashi-hama, Nakayama, Taisha-chô, Izumo-shi, Shimane-ken (35.433N, 132.634E), 24 III 2009, Hayama-T. (shingle beach; cHayam); 1 ♂, 1 ♀, Akaishihana, Hinomisaki, Taisha-chô, Izumo-shi, Shimane-ken (35.411N, 132.650E*), 2 IV 2009, Hayama-T. (cHayam); 7 ♀, same data, but 2-8 V 2009 (FIT); 1 ♂, Kiami-chô, Masuda-shi, Shimane-ken (34.676N, 131.747E), 10-11 V 2009, Hayama-T. (FIT; cHayam). **[Kyûshû]**: 1 ♂, Odo-kôen park, Odo-2chôme 6, Nishi-ku, Fukuoka-shi, Fukuoka-ken (33.596N, 130.311E), 28 VI 2009, Yamamoto-S. (from seaweed on sandy beach with *Aleochara* (*E.*) *segregata*; cYam); 2 ♂, Sato (Kamikoshiki-jima), Sato-machi, Satsumasendai-shi, Kagoshima-ken (31.844N, 129.919E), 11-12 IV 1973, Furuki-Y. (EEEU).

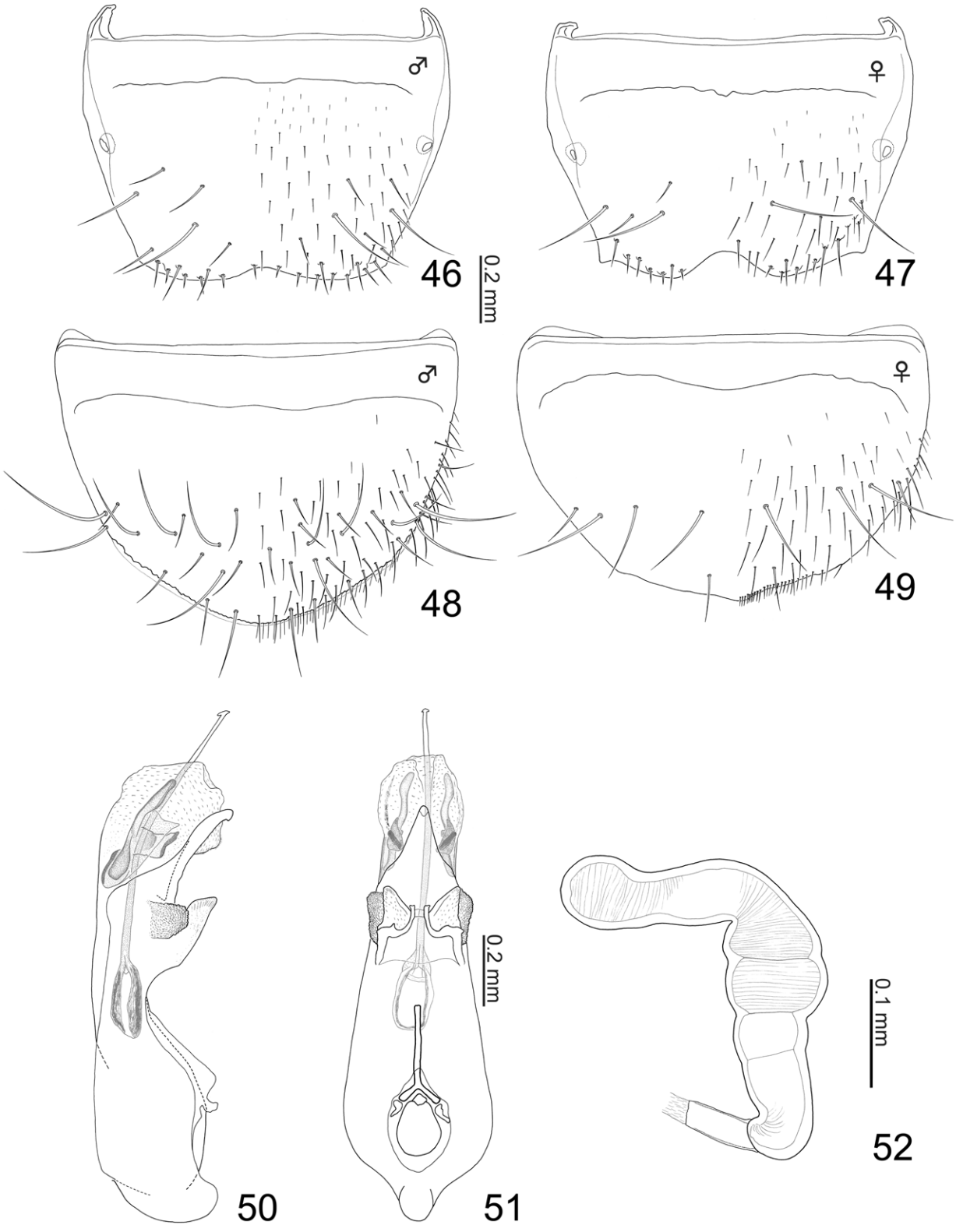
Description. Body (Fig. 3): small to medium sized, slender body; surface of pronotum and elytra somewhat densely haired by rather short and thin setae; fore-body (head, pronotum and elytra) weakly shining due to extremely minute hexagonal microstructures. **Colour** (Fig. 3): gland colour complete black; legs dark brown to reddish brown, tarsal segments orange brown to reddish brown: maxillary and labial palpi blackish brown to yellowish brown; antennae blackish brown and partly reddish brown. **Head**: impunctured area along midline not uniquely elevated at all. **Antennae** (Fig. 42): entirely slender; slightly longer than combined length of head and pronotum; segment I, nearly 2.8 times as long as broad; segment II somewhat shorter than I; segment III as same length as II; segments IV and V long barrel shape, clearly longer than width; segments VI to VII short barrel shape; segments VIII to X transverse; last segment somewhat long, about 1.7 times as long as broad; relative length (width) of segments from basal to apical: 11(4): 7(3): 6.5(3): 4(3): 4.5(3.5): 4(4): 4(4): 5(5): 6(5): 4.5(5): 10(6). **Thorax**: pronotum somewhat strongly convex above, with moderately rounded posterior margin; slightly wider than long (PW/PL =1.23), clearly broader than head (PW/HW =1.38), widest just behind middle; surface with extremely minute hexagonal reticulations with inconspicuous punctures. Metaventrite, about 1.6 times as long as mesoventrite. Inter coxal process of mesoventrite sharply pointed with very short carina along midline, about 0.3 times as long as mesoventrite. Inter coxal process of metaventrite broad and somewhat long, and apical margin pointed moderately. **Legs**: relative lengths of tarsomeres from basal to apical: 4.5: 3: 3: 3: 10 in foretarsus, 6: 5: 5: 5: 13 in midtarsus, 8: 6: 6: 6: 16 in hindtarsus.

[**Male**]: posterior margin of tergite VIII (Fig. 38) very weakly emarginated medially, with around 7 to 8 macrosetae. Sternite VIII (Fig. 40) with about 12 macrosetae; posterior margin very strongly pointed toward apex, forming triangular. Median lobe of aedeagus (Figs. 43–44) C-curved (sponge-gourd shape) in lateral view (Fig. 43); moderately narrowed apically in ventral view (Fig. 44); a pair of subapico-ventral projections thick, robust and straight in lateral view (Fig. 43); basal swelling of aedeagus, circularly rounded in lateral view (Fig. 43); apical lobe of median lobe very short isosceles shape in ventral aspect (Fig. 44); flagellum extremely longer than the whole length of median lobe (Figs. 43–44).

[**Female**]: posterior margin of tergite VIII (Fig. 39) slightly rounded, but very weakly emarginated medially, with about 7 macrosetae. Posterior margin of sternite VIII (Fig. 41) rounded or weakly pointed, with around 8 macrosetae. Spermatheca (Fig. 45): spermathecal head as long as apical portion of spermathecal stem; basal portion of spermathecal stem very short and curved; sclerotized portion of spermathecal stem thin and erect; each part of spermatheca except for membraneous portion of spermathecal duct (sm) entirely and very weakly sclerotized; (sm) extremely long in length.

Measurements (male: n=10): BL, 2.94–4.65 (4.00±0.49); FBL, 1.66–2.07 (1.87±0.15); HL, 0.46–0.68 (0.56±0.07); HW, 0.53–0.69 (0.60±0.05); AL, 1.11–1.51 (1.30±0.14); PL, 0.59–0.78 (0.69±0.06); PW, 0.60–0.92 (0.83±0.06); EL, 0.57–0.77 (0.67±0.06); EW, 0.94–1.27 (1.08±0.10); HTL, 0.57–0.79 (0.66±0.07).

Measurements (female: n=10): BL, 3.23–4.64 (4.04±0.38); FBL, 1.50–2.11 (1.91±0.20); HL, 0.44–0.62 (0.55±0.05); HW, 0.51–0.66 (0.60±0.04); AL, 1.03–1.32 (1.18±0.09); PL, 0.53–0.73 (0.66±0.07); PW, 0.68–0.91 (0.83±0.07); EL, 0.62–0.77 (0.69±0.05); EW, 0.87–1.18 (1.07±0.10); HTL, 0.55–0.78 (0.68±0.07).



FIGURES 46–52. Terminalia of *Aleochara* (*Emplenota*) *yamato*. 46. tergite VIII of male; 47. tergite VIII of female; 48. sternite VIII of male; 49. sternite VIII of female; 50. male genitalia: median lobe of aedeagus in lateral view; 51. male genitalia: median lobe of aedeagus in ventral view; 52. female genitalia: spermatheca.

Distribution. [**JAPAN**]: Honshû, Kyûshû, Dôgo Is., Kamikoshiki-jima. See, Fig. 103.

Diagnosis. *Aleochara hayamai* is a peculiar species and can be easily discriminated from other Japanese *Emplenota* species by following character states: small to medium size body (not large species); gland colour

completely black and somewhat strongly shining even in mat area of the forebody (hexagonal structures on dorsal surface very minute compared to the other Japanese *Emplenota* species), and deep punctures of dorsal surface on forebody inconspicuous (Fig. 3); longitudinal impunctured area of head along midline not uniquely elevated at all; lateral margin of pronotum somewhat convex toward anterolaterally; antennae entirely slender, especially segments IV to V which close to long barrel shape rather than spherically short barrel shape (Fig. 42); legs somewhat long and slender (HTL =0.67). [**Male**]: sternite VIII (Fig. 40) sharply pointed toward posterior, making sharp triangular; median lobe of aedeagus (Figs. 43–44) unique with extremely long flagellum; subapico-ventral projections of median lobe robust and straight in lateral view (Fig. 43). [**Female**]: spermatheca (Fig. 45) unique in shape; very weakly sclerotized uniformely, with short basal portion of spermathecal stem and extraordinary long membraneous portion of spermathecal duct.

Etymology. The species, *Aleochara hayamai*, is dedicated to Mr. Takeshi Hayama (Okinawa-ken), who found this species for the first time during his ecological survey of coastal insects in Shimane-ken.

Remarks. Numerous individuals were collected by Mr. T. Hayama in Shimane-ken (Honshû). He researched the entire coastal region of Shimane-ken to study coastal insect ecology and succeeded in collecting a few specimens of *A. hayamai*. Mr. Hayama discovered its peculiarity and sent us the specimen. We examined more than 2,000 specimens of *Emplenota* from all over Japan, but this species seems to be rare except in Shimane-ken and we found it from only three other localities. *Aleochara hayamai* has similar external characters to other Japanese species, however, the species is outstanding by having huge and peculiar male genitalia.

Aleochara (*Emplenota*) *yamato* Yamamoto & Maruyama n. sp.

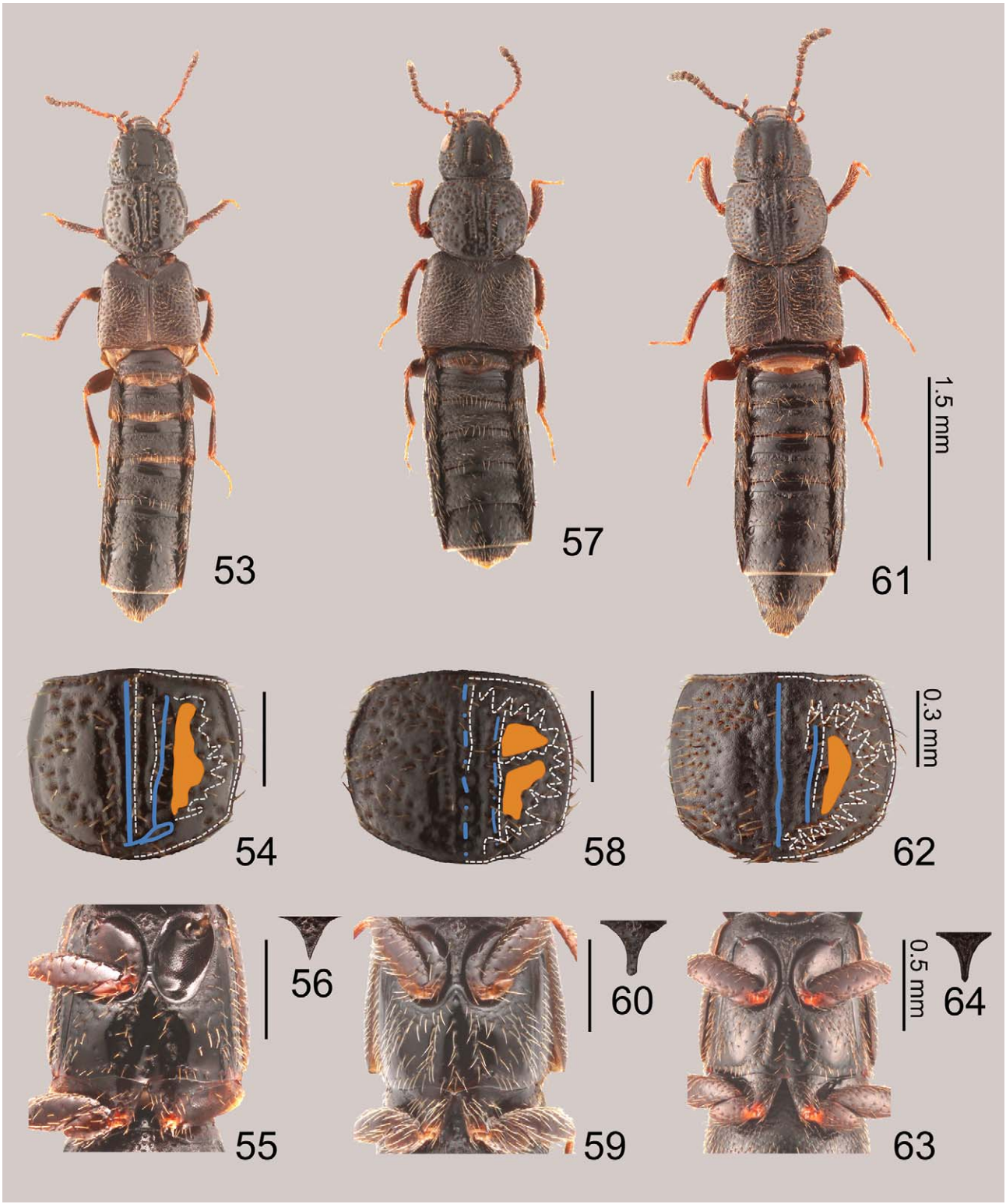
(Figs. 4, 46–52, 97, 103)

Type series. Holotype, ♂, **JAPAN**: Kakanokuketo, Shimane-chô, Matsue-shi, Shimane-ken, Honshû (35.578N, 133.050E), 1 IV 2009, Hayama-T. (shingle beach; KUM).

Paratypes, 4 ♂, 4 ♀, same data as holotype (KUM).

Description. Body (Fig. 4): extremely large; robust; somewhat thickly elongated; entire surface of pronotum and elytra covered with numerous brown hairs somewhat densely, but inconspicuous; somewhat large hexagonal microstructures on dorsal surface of head, pronotum and elytra; distinct and prominent punctures on dorsal surface of head and pronotum; punctures on elytra deep. **Colour** (Figs. 4, 6): gland colour blackish brown to black; legs, especially tarsal segments, reddish brown: maxillary and labial palpi blackish brown to reddish brown; antennae blackish brown and partly light brown. **Head** (Fig. 6): somewhat wide (HW/HL = 1.25), widest at just behind eyes; impunctured area of forepart flattened but of basal part prominently and spherically swollen (not carinate; see, Fig. 6: arrow); surface sparsely covered with medium sized setae; uniformly observed huge hexagonal reticulations on dorsal surface with relatively large distinct punctures. **Antennae**: thick and robust; segment I, not so thick, nearly 3.0 times as long as broad; segment II clearly shorter than I; segment III clearly longer than II; segment IV short barrel shape, slightly longer than width; segments V and VI barrel like shape; segments VII to X clearly transverse; segment XI, about 2.0 times as long as broad; relative length (width) of segments from basal to apical: 9(3): 4.5(2.5): 6.5(2.5): 3.5(3): 3.5(4): 3.5(4): 3.5(5): 3.5(5): 3.5(5): 3.5(5): 8(4). **Thorax**: pronotum moderately wider than long (PW/PL =1.24), a little broader than head (PW/HW =1.36); strongly constricted near base; surface mat with large hexagonal reticulations and deep distinct punctures. Inter coxal cavities of mesoventrite very narrowly separated. Apex of inter coxal process of mesoventrite extremely sharp with exceedingly short carina (almost nothing) along midline, about 0.11 times as long as mesoventrite. Metaventrite, about 1.8 times as long as mesoventrite. Inter coxal process of metaventrite broad and short, rounded apically. **Legs**: hindtibia somewhat long, nearly same length as elytra; relative lengths of tarsomeres from basal to apical: 7: 4: 4: 3.5: 16 in foretarsus, 11: 7.5: 7.5: 7.5: 20.5 in midtarsus, 12: 11: 8: 8: 23 in hindtarsus.

[**Male**]: tergite VIII (Fig. 46) clearly emarginated medially at posterior margin, with around 8 macrosetae. Sternite VIII (Fig. 48) with about 7 macrosetae and around 7 thin macrosetae; posterior margin strongly rounded. Aedeagus (Figs. 50–51) extremely large; median lobe elongated and moderately narrowed toward apex, elongated pyriform in ventral view (Fig. 51); a pair of subapico-ventral projections straight, quite thick and robust in lateral aspect (Fig. 50); basal swelling of aedeagus, circularly curved and pointed in lateral view (Fig. 50); apical lobe of median lobe long and moderately curved in lateral view (Fig. 50), and clearly isosceles shape in ventral view (Fig. 51); flagellum shorter than the whole length of median lobe (Figs. 50–51).



FIGURES 53–64. Japanese species of *Aleochara* (*Triochara*). 53-56. *Aleochara* (*Triochara*) *trisulcata*; 57-60. *A.* (*T.*) *zerchei*; 61-64. *A.* (*T.*) *nubis*. (Habitus: 53, 57, 61; Pronotum: 54, 58, 62; Mesoventrite and metaventrite: 55, 59, 63; Inter coxal process of mesoventrite: 56, 60, 64).

[**Female**]: tergite VIII (Fig. 47) strongly emarginated at posterior margin, with around 4 macrosetae. Shape of sternite VIII (Fig. 49) closely similar to that of male, but pointed somewhat weakly, with 5 macrosetae. Spermatheca (Fig. 52): spermathecal head (sh) about twice longer than apical portion of spermathecal stem; neck of spermatheca very long, somewhat longer than (sh); collar thick; basal portion of spermathecal stem (sb) slightly

narrowing toward base, with bent at base; sclerotized portion of spermathecal stem short, erect and sclerotized; each part of spermatheca except for membraneous portion of spermathecal duct (sm) entirely and moderately sclerotized; (sm) moderate in length.

Measurements (male: n=5): BL, 4.80–5.99 (5.63±0.47); FBL, 2.59–2.96 (2.76±0.19); HL, 0.65–0.78 (0.71±0.06); HW, 0.81–0.95 (0.89±0.06); AL, 1.46–1.76 (1.59±0.14); PL, 0.87–1.06 (0.98±0.07); PW, 1.15–1.27 (1.22±0.06); EL, 0.94–1.20 (1.03±0.11); EW, 1.03–1.71 (1.46±0.27); HTL, 0.92–1.13 (1.00±0.09).

Measurements (female: n=3): BL, 5.50–6.25 (5.95±0.40); FBL, 2.73–2.89 (2.82±0.08); HL, 0.73–0.79 (0.75±0.03); HW, 0.88–0.96 (0.93±0.04); AL, 1.61–1.69 (1.64±0.04); PL, 0.94–1.06 (1.02±0.07); PW, 1.16–1.32 (1.26±0.09); EL, 1.00–1.15 (1.06±0.08); EW, 1.56–1.66 (1.63±0.06); HTL, 0.91–1.04 (0.98±0.07).

Distribution. [**JAPAN**]: Honshû (Shimane-ken). See, Fig. 103.

Diagnosis. This species, *Aleochara yamato*, can be easily differentiated from other congeners by a combination of features as follows: very rare species (only one locality known so far); body extremely large (BL =5.79; Fig. 4); dorsal surface of forebody with prominently deep and distinct punctures; dorsal surface of impunctured area of head largely flattened but of basal part prominently and spherically swollen (see, Fig. 6: arrow); head capsule transverse (HW/HL =1.25: other Japanese species ≈1.14); quite short carina on mesoventrite about 0.1 times as long as mesoventrite. [**Male**]: posterior margin of tergite VIII (Fig. 46) prominently emarginated; outer margin of sternite VIII (Fig. 48) clearly rounded in the middle; median lobe of aedeagus (Figs. 50–51) large and elongated; subapico-ventral projections on median lobe straight, thick and robust in lateral view (Fig. 50); apical lobe of median lobe long and moderately curved in lateral aspect (Fig. 50); basal swelling (Fig. 50) of median lobe strongly rounded toward ventral margin as in *A. puetzi* (Fig. 27). [**Female**]: posterior margin of tergite VIII (Fig. 47) strongly emarginated; spermatheca (Fig. 52) unique in shape; combined length of (sh) and (sn) very long, more than 4 times as apical portion of spermathecal stem.

Etymology. The specific epithet *yamato* is an old name of Japan.

Remarks. The species clearly differs from the other *Emplenota* species by having a larger body, prominent spherical swelling on the dorsal surface of the head base (see, Fig. 6), and deep punctures in the fore body. In addition, tergite VIII and sternite VIII of *Aleochara yamato* are unique in both sexes. Only nine specimens have been obtained to date. Type materials were collected by Mr. T. Hayama in Shimane-ken (Honshû) as with *Aleochara hayamai*. Ecological information for this species, including detailed habitats and seasonal patterns, is not known.

Key to the Japanese species of the subgenus *Emplenota*

1. Body large (Mean: 5.79 mm); Head wide (HW/HL = 1.25).

(1) Dorsal surface of entire forebody covered with deep and prominent punctures (Fig. 4). Dorsal surface of head base, clearly swollen spherically above (Fig. 6). Carination on mesoventrite very short, about 0.11 times as long as mesoventrite. Inter coxal process of mesoventrite very sharply pointed. [**Male**]: tergite VIII (Fig. 46) moderately emarginated. Posterior margin of sternite VIII (Fig. 48) rounded. Median lobe (Fig. 50) large and elongated with stout and straight subapico-ventral projections in lateral view. [**Female**]: tergite VIII (Fig. 47) strongly emarginated. Spermatheca (Fig. 52) unique; (sn) extremely long. Very rare species (Fig. 103) . . . . . *Aleochara* (*Emplenota*) *yamato*

- Body small to relatively large size (Mean: 4.05 mm); HW/HL ≈ 1.14 2

2. Impunctured area on dorsal surface of head with carina or elevated.

(2) Body pubescent (Fig. 5). Dorsal surface of forebody with numerous distinct punctures. [**Male**]: posterior margin of sternite VIII (Fig. 32) strongly producd, but having rounded apex. Median lobe (Fig. 34–35): subapico-ventral projections curved gently in lateral angle (Fig. 34); subparallel sided (Fig. 35) and apical lobe narrowing abruptly making sharp triangular in ventral aspect (Fig. 36). [**Female**]: head (sh) and stem (sa, sb) of spermatheca (Fig. 37) quite thick and wide, without erect and sclerotized portion of stem (ss). Commonest species in Japan (Fig. 102) . . . . . *A.* (*E.*) *segregata*

- Impunctured area of head flattened and not clearly swollen or elevated at all. 3

3. Distribution limited to subarctic to cool temperate zones. Dorsal surface of forebody with inconspicuous punctures. Antennae entirely thick with segment IV short and barrel-shaped.

(3) Dorsal surface of forebody with shallow and inconspicuous punctures (Fig. 2). [**Male**]: sternite VIII (Fig. 25) strongly pointed toward apex. Subapico-ventral projections on median lobe clearly straight (Fig. 27); posterior margin of (bs) pointed sharply toward ventral margin of median lobe in lateral aspect (Fig. 27); apex of sclerite triangular in lateral view (Fig. 27). [**Female**]: stem (sb) with bent around middle (Fig. 29), and having sclerotized portion of stem (ss). . . . . *A.* (*E.*) *puetzi*

- Distribution more expansive and including cool temperate regions; species mainly found in temperate zone. 4

4. Antennae slender, especially segments IV and V. Dorsal surface of forebody with weak and inconspicuous punctation.

(4) Body complete black and shining (Fig. 3). Pronotum somewhat strongly convex above. Impunctured area of head scarcely

swollen. Antennae (Fig. 42) with long barrel shape of segment IV. [**Male**]: posterior margin of sternite VIII (Fig. 40) sharply pointed, making triangular. Aedeagus (Figs. 43–44) quite unique with extremely long flagellum. [**Female**]: spermatheca (Fig. 45) weakly sclerotized entirely, with short (sb) and extremely long spermathecal duct (sm). Distribution limited to central to western Honshû and Kyûshû, Japan. Rare species.. . . . . *A.* (*E.*) *hayamai*

- **Punctures on dorsal surface of forebody somewhat deep and prominent. Antennae rather thick with segment IV short and barrel-shaped.**
  [**Male**]: sternite VIII (Fig. 16) weakly pointed toward apex. Subapico-ventral projections on median lobe weakly curved in lateral view (Fig. 18). [**Female**]: spermathecal stem (sb) (Fig. 22) simple, moderately curved without bent around middle and usually at base, attached to sclerotized (ss). Common species in Japan. . . . . .*A.* (*E.*) *fucicola*

Subgenus *Triochara* Bernhauer, 1901

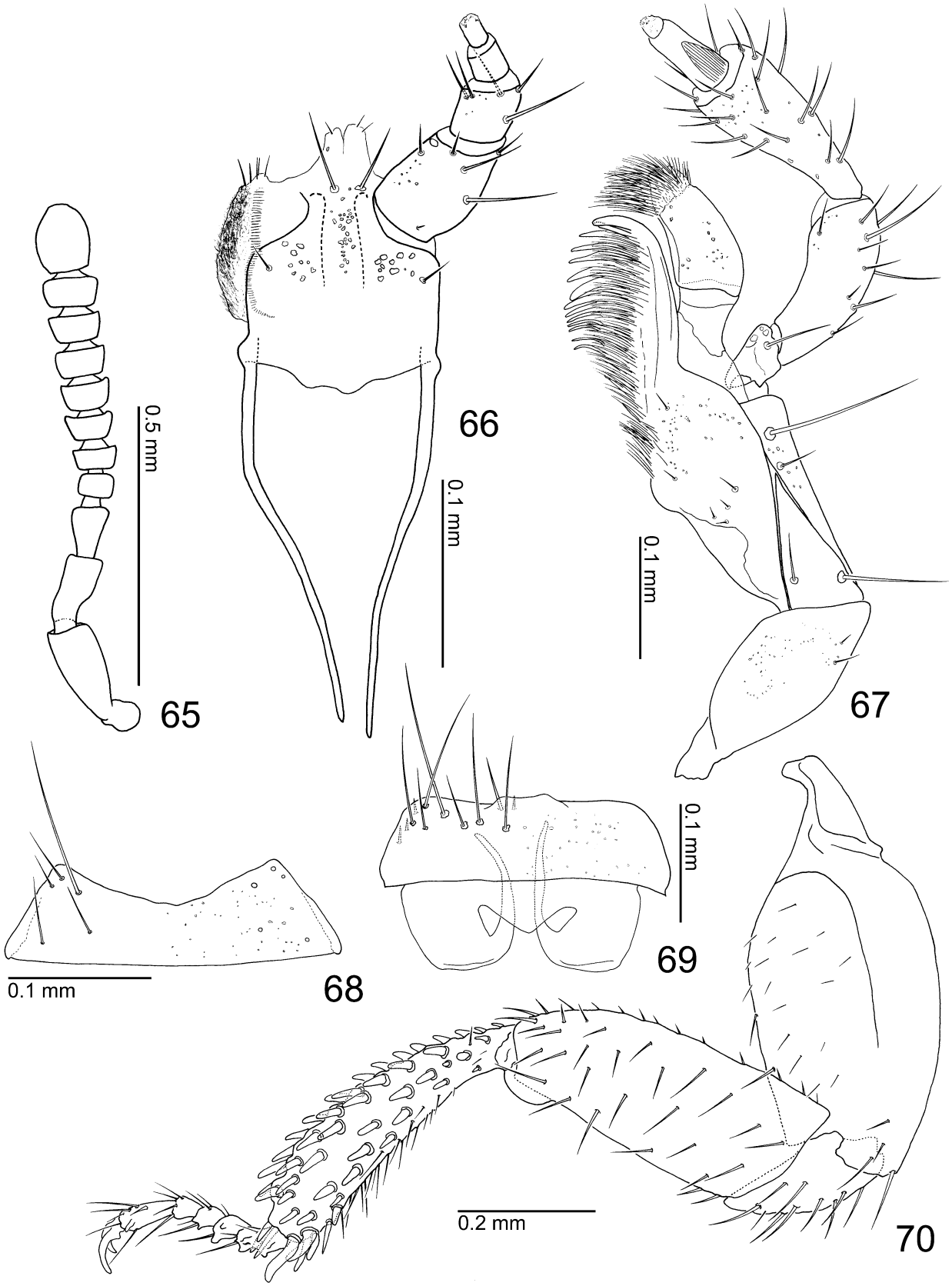
(Figs. 53–92, 98–100, 104–105)

Triochara Bernhauer, 1901b: 373 (original description; type species: *Aleochara trisulcata* Weise, 1877); Eichelbaum, 1909: 246 (as subgenus; generic catalogue of world Staphylinidae); Fenyes, 1920: 398 (as subgenus; key to world subgenera of *Aleochara*), 414 (as subgenus; catalogue of world species; diagnosis; addition of 5 species to genus); Scheerpeltz, 1925: 447 (as subgenus; catalogue of Palaearctic species of Aleocharinae); Bernhauer & Scheerpeltz, 1926: 795 (as subgenus; catalogue of world species of Aleocharinae; exclusion of these 5 species and only one species, *A. trisulcata*, left as subgenus); Blackwelder, 1952: 397 (as subgenus; catalogue entry; generic catalogue of world Staphylinidae); Assing, 1995: 219 (as genus; diagnostic key to genera), 229 (notes on genus), 230 (key to all species of genus), 230 (descriptions of each species); Maus & Ashe, 1998c (online) (world checklist of subgenus; diagnosis; bionomics; phylogenetic relationships); Smetana, 2004: 358 (as subgenus; catalogue of Palaearctic species of Aleocharinae).

Redescription. Body (Figs. 53, 57, 61): narrowly elongated extremely, and almost subparallel sided; whole length varying from 2.8 to 5.0 mm, normally around 3.3-3.9 mm; dorsal surface shining to less shining, covered with coarse and distinct punctures. Surface of head and pronotum partly covered with coarse and short but thick setae. **Colour** (Figs. 53, 57, 61): uniformly blackish gray to black sometimes with somewhat lighter colour in elytra. **Head**: rounded subquadrangular (HW/HL ≈1.18), moderately convex above, widest around base; dorsal surface of head with two longitudinal and subparallel deep furrows and connected by a transverse deep furrow or by a somewhat shallow impression. Eyes very small, not clearly protruding laterally. **Antennae** (Fig. 65): moniliform (similar to filiform); robust, thick and extremely short, clearly shorter than combined length of head and pronotum. **Mouth Parts**: mandibles asymmetric, left mandible with small tooth near apex. Clypeus truncate at apex. Labrum (Fig. 69) transverse, about 1.7 times wider than long; anterior margin slightly emarginated medially; basal half semi-transparent. Mentum (Fig. 68) trapezoidal and strongly emarginated transversely along anterior margin, about 3.2 times as wide as long. Labial palpus (Fig. 66) with segment I prominently thick and longer than segment II; segment III prominently narrower and shorter than II, with minute pseudosegment. Segments of maxillary palpus (Fig. 67) robust, especially, segment II and III; pseudosegment prominent; segment II same length as III; pseudosegment prominent; lacinia with numerous hairs and with about 13 very thick spines pectinately. **Thorax**: pronotum (Figs. 54, 58, 62) largely octagonal to oblong (PW/PL ≈1.18) with prominent furrows (usually three longitudinal sulci) along midline; slightly longer than head length (PL/HL ≈1.29), slightly broader than head (PW/HW ≈1.29). Hypomera visible in lateral view. Mesocoxae narrowly separated (Figs. 55, 59, 63). Mesoventrite not carinate at all (Figs. 55–56, 59–60, 63–64). **Elytra**: widened toward posterior margin, much broader than long (EW/EL ≈1.44), and slightly wider than pronotum (EW/PW ≈1.16); posterior margin of each elytra nearly truncate but gently rounded toward posterior margins; surface rugosely punctured both hexagonal microsculptures and prominent distinct punctures in the species (*A. nubis*); entire surface densely covered with brown setae; anterior margin with a relatively long blackish bristle. **Legs** (e. g., Fig. 70): short, thick, robust and with numerous thick spines on surface, especially on fore and mid tibia; tarsi quite short, hindtarsi extremely short (hind tarsal length/mid tarsal length ≈1.25). **Hind wing**: entire; veins weakly sclerotized and very obscure; posterior margin with a row of numerous white hairs. **Abdomen** (Figs. 53, 57, 61): narrowly elongated and almost pararell sided; tergite III-VI impressed weakly and transversely at base. Posterior margin of tergite VIII (Figs. 71–72), with a row of thick and short several sensory setae or a row of thin and long setae (Figs. 79–80, 86–87).

[**Male**]: posterior margin of sternite VIII (Figs. 73, 81, 88) not pointing strongly, and its shape not greatly varies among species. Median lobe (Figs. 75, 83, 90) compactly elongated. Median lobe of aedeagus with a pair of subapico-ventral projections (Figs. 75, 83, 90) as well as *Emplenota* species; shape of these projections varying

greatly among species. Median lobe of aedeagus (Figs. 75–76, 83–84, 90–91) with rather short but prominent flagellum, as long as median lobe of aedeagus. Apical lobe of paramerite (Fig. 77) narrowly elongated with four setae.



FIGURES 65–70. Body parts of *Aleochara* (*Triochara*) *trisulcata* of male. 65. right antenna; 66. labium; 67. maxilla; 68. mentum; 69. labrum; 70. right foreleg in ventral view.

[**Female**]: tergite VIII (Figs. 72, 80, 87) similar to that of male. Sternite VIII (Figs. 74, 82, 86) having less pointed apex than male, but sometimes very similar to that of male. Spermatheca (Figs. 78, 85, 92) with shallow apical invagination of spermatheca (ai); head (sh) large, moderately swollen, less or longer than twice length of apical portion of stem (sa); spermathecal neck (sn) very short and united with (sh); without a distinct collar in spermatheca (different from *Emplenota*: Fig. 22); basal portion of stem (sb) narrow and distorted, and with short and erect sclerotized portion of spermathecal stem (ss); membraneous portion of spermathecal duct (sm) moderate in length; inner wall of (sh) and (sa) moderately striate; each part of spermatheca except for (sm) entirely and moderately sclerotized.

Diagnosis. The distinct subgenus *Triochara* Bernhauer is somewhat similar to the members of the subfamily Oxytelinae (Staphylinidae) rather than the members of Aleocharinae by having furrows on head and pronotum, and by heavily sclerotized, subparallel-sided body. This subgenus is therefore easily discriminated from other littoral staphylinids by following character states: antennae (e. g., Fig. 65) very short, almost moniliform, and quite robust; dorsal surface of head (Figs. 53, 57, 61) with two deep furrows along midline; pronotum (Figs. 54, 58, 62) with longitudinal sulci and three-dimensional pattern on dorsal surface; tarsal fomula: 5-5-5; mesoventrite without carina at all (Figs. 55–56, 59–60, 63–64); legs (e. g., Fig. 70) short but thick, covered with numerous thick spines, especially on tibia. [**Male**]: sternite VIII (Figs. 73, 81, 88) similar shape that of female, and not greatly discriminated from female (Figs. 74, 82, 89; *Emplenota* species differes between both sexes); median lobe of aedeagus (Figs. 75–76, 83–84, 90–91) with short but projecting flagellum, and subapico-ventral projections varying in shape among species. [**Female**]: spermatheca (Figs. 78, 85, 92) simple; head (sh) large; neck (sn) short and fused with (sh); lacking distinct collar, but with erect duct (ss).

Comments. All of the three known species of the subgenus are similar to each other in habitus, but pronotal patterns, the median lobe of the aedeagus, and tergite VIII of both sexes can be easily differentiated. However, the shape of sternite VIII, which usually act as important character state, do not provide precise identification method in *Triochara*.

The life history of *Triochara* is thought to be similar to that of *Emplenota* and *Polystomota* (Assing, 1995). For information on the dipteran host of *A.* (*T.*) *trisulcata* Weise, 1877, see Yamazaki (2008, 2012). A larval description has never been published.

Aleochara (*Triochara*) *trisulcata* Weise, 1877

(Figs. 53–56, 65–78, 104)

Aleochara trisulcata Weise, 1877: 88 (original description; type locality: "Hagi" [Hagi-shi, Yamaguchi-ken, western end of Honshû]); Lewis, 1879: 6 (catalogue of Japanese Coleoptera); Schönfeldt, 1887: 66 (catalogue of Japanese Coleoptera); Sawada, 1972: 39 (chaetotaxy of labial palpus), 40 (comments on pores of labial pulpus); Shibata, 1985: 321 (short description in Japanese; Coleoptera of Japan), pl. 56 (habitus of specimen; misidentification of *A. zerchei*?); Naomi, S.I., 1989: 280 (checklist of Japanese Staphylinidae).

Aleochara (*Triochara*) *trisulcata* Weise, 1877; Bernhauer, 1901b: 373 (establishement of subgenus); Fenyes, 1920: 414 (catalogue of world species of Aleocharinae); Scheerpeltz, 1925: 447 (catalogue of Palaearctic species of Aleocharinae); Bernhauer & Scheerpeltz, 1926: 795 (catalogue of world species of Aleocharinae); Adachi 1957: 34 (catalogue of Japanese species of Staphylinidae); Nakane, 1963: 100 (description in Japanese; Coleoptera of Japan), pl. 50 (habitus of specimen; misidentification of *A. zerchei*?); Sawada, 1971: 312 (redescription); Sawada, 1972: table (character states, listed); Maus & Ashe, 1998c (online) (world checklist of subgenus); Cho & Ahn, 2001: 14, 31 (checklist of Korean Silphidae and Staphylinidae), 157(pl. 2) (habitus of specimen; misidentification of *A. zerchei*?); de Rougemont, 2001: 85 (record from Hong Kong); Park & Ahn, 2004: 195 (key to littoral species of genus *Aleochara* in Korea), 196 (diagnosis; record from South Korea); Smetana, 2004: 358 (catalogue of Palaearctic species of Aleocharinae); Yamazaki, 2008: 152 (dipteran host record); Frank & Ahn, 2011: 20 (checklist of coastal Staphylinidae of world); Yamazaki, 2012: 32 (ecological research).

Triochara trisulcata (Weise, 1877); Assing, 1995: 230 (diagonostic key to species of genus), 230 (redescription; lectotype designation).

Aleochara (*Triochara*) *trisultata* Weise, 1877 [misspelling]; Kuwayama, 1967: 138 (record from Kunashiri-tô; insect catalogue of southern Kuril Islands; misidentification of *A.* (*T.*) *zerchei* or *A.* (*T.*) *nubis*?).

Type specimens. Not examined.

Non-type specimens. JAPAN: **[Honshû]**: 4 sex?, Benten-misaki (Sadoga-shima), Higashikowashimizu, Sado-shi, Niigata-ken (38.008N, 138.546E), 4 V 1998, Kinoshita-T. (cWat); 1 sex?, same data, but 5 V 1998,

Tsuyuki-S. (cWat); 2 sex?, Ikarashi-hama, Ikarashi-2no-chô, Niigata-shi, Niigata-ken (37.871N, 138.927E), 29 V 1991, Hayashi-M. (sandy beach; cKaw); 1 ♂, Naga-hama, Nagai-2chôme 13, Yokosuka-shi, Kanagawa-Ken (35.191N, 139.615E), 7 IV 1975, Tao-M. (KUM); 1 sex?, Tsumeki-zaki, Shimoda-shi, Shizuoka-ken (34.659N, 138.987E), 21 IV 2003, Maruyama-M. (cMar); 2 sex?, Mukaiawagasaki, Uchinada-machi, Kahoku-gun, Ishikawa-ken (36.640N, 136.622E), 12 IV 1948, Takaba-S. (KUM); 2 sex?, Obama-shi, Fukui-ken (35.485N, 135.719E*), 6 VI 1980, Naomi-S.I. (KUM); 1 ♀, Maizuru, Kyôto-fu (35.514N, 135.387E*), 3 V 1980, Hayashi-Y. (cHayas); 1 sex?, river mouth of Onosato-gawa, Tarui, Sennan-shi, Ôsaka-fu (34.377N, 135.250E), 15 IV 2001, Kawakami-Y. (cKaw); 3 ♂, 24 sex?, Kugui, Higashi-ku, Okayama-shi, Okayama-ken (34.584N, 134.086E*), 31 III 2003, Fujitani-Y. (KUM); 2 ♀, 31 sex?, same data, but 9 V 2003 (under seaweed on beach); 18 sex?, same data, but 28 V 2003; 1 ♂, 11 sex?, Inazumi, Sugeura, Mihonoseki-chô, Matue-shi, Shimane-ken (35.564N, 133.166E*), 1-2 VI 2008, Hayama-T. (sandy beach; cHayam); 70 sex?, Konami-kaigan, Nonami, Shimane-chô, Matue-shi, Shimane-ken (35.589N, 133.098E), 2-3 VI 2008, Hayama-T. (cHayam); 1 sex?, Koura-kaigan, Koura, Kashima-chô, Matue-shi, Shimane-ken (35.520N, 132.975E), 16-18 VII 2009, Hayama-T. (FIT; cHayam); 47 sex?, Sotozono-kaigan, Sashiumi, Koryô-chô, Izumo-shi, Shimane-ken (35.333N, 132.664E), 8 III 2007, Hayama-T. (under seaweed; cHayam); 37 sex?, same data, but 12-13 IV 2009; 26 sex?, Kotoga-hama, Maji, Nima-chô, Ôda-shi, Shimane-ken (35.131N, 132.389E), 2 V 2009, Hayama-T. (YPT on supratidal zone; cHayam); 6 sex?, Kuromatsu-chô, Gôtsu-shi, Shimane-ken (35.057N, 132.310E), 2 V 2009, Hayama-T. (from seaweed; cHayam); 1 sex?, Iwami-kaigan, Kushiro-chô, Hamada-shi, Shimane-ken (34.955N, 132.127E), 16-17 VI 2008, Hayama-T. (YPT; cHayam); 1 sex?, Nagashima (Naga-shima), Kaminoseki-chô, Kumage-gun, Yamaguchi-ken (33.827N, 132.091E), 1 V 2008, Moriguchi-M. (KUM). **[Shikoku]**: 3 sex?, Ariake-hama, Muromoto-chô, Kanonji-shi, Kagawa-ken (34.139N, 133.642E), 9 IV 2011, Fujimoto-H. (sandy beach; KUM); 23 sex?, Iwagi (Akahone-jima), Kamijima-chô, Ochi-gun, Ehime-ken (34.234N, 133.159E*), 2 V 2009, Satô-Y. (EEEU); 5 sex?, same data, but 7 V 2010, Senda-Y.; 2 ♂, 2 ♀, 2 sex?, Ôura, Matsuzaka-shi, Ehime-ken (33.996N, 132.771E), 15 IV 2010, Kawakami-Y. (cKaw). **[Kyûshû]**: 9 sex?, Watari, Fukutsu-shi, Fukuoka-ken (33.786N, 130.454E), 21 IV 2012, Yamamoto-S., Maruyama-M., Kanao-T. (from seaweed on small sandy beach with *Aleochara* (*Emplenota*) *segregata*; KUM); 10 sex?, Watari, Fukutsu-shi, Fukuoka-ken (33.790N, 130.447E), 21 IV 2012, Yamamoto-S., Maruyama-M., Kanao-T. (from seaweed on huge sandy beach with *A.* (*E.*) *segregata*; KUM); 2 sex?, Mitoma, Higashi-ku, Fukuoka-shi, Fukuoka-ken (33.703N, 130.417E), 3 VI 2001, Ogata-S. (KUM); 13 ♂, 23 sex?, Shimomaga-hama, Katsuma, Higashi-ku, Fukuoka-shi, Fukuoka-ken (33.684N, 130.290E), 15 V 2011 (11:30), Yamamoto-S. (seaweed on sandy beach with *A.* (*E.*) *segregata*; cYam); 113 sex?, same data, but 21 III 2012; 2 sex?, Noko (Nokono-shima), Nishi-ku, Fukuoka-shi, Fukuoka-ken (33.608N, 130.299E), 20 III 2009, Yamamoto-S. (from a seaweed mass on sandy beach with *A.* (*E.*) *segregata* and *A.* (*T.*) *zerchei*; cYam); 1 sex?, Takero-kaigan, Kayaki-machi, Nagasaki-shi, Nagasaki-ken (32.638N, 129.799E), 29 III 1992, Kusui-Y. (cItô); 2 sex?, Kin (Tsu-shima), Kamitsushima-chô, Tsushima-shi, Nagasaki-ken (34.568N, 129.469E), 5 V 2009, Yamamoto-S. (from decaying seaweed on sandy beach with *A.* (*E.*) *fucicola*; cYam); 1 ♂, 3 ♀, 8 sex?, Higashimochida, Aira-chô, Aira-gun, Kagoshima-ken (31.724N, 130.640E*), 22 V 1984, Ôhara-M. (KUM). **[Ryûkyû]**: 1 ♂, 8 ♀, 5 sex?, Nakatane-chô (Tanega-shima), Kumage-gun, Kagoshima-ken (30.515N, 130.980E), 8-13 V 1996, Maruyama-M. (cMar); 1 ♀, Akaogi (Amami-Ôshima), Tatsugou-chô, Ôshima-gun, Kagoshima-ken (28.415N, 129.627E), 25 III 1978, Naomi-S.I. (KUM); 2 sex?, Kametsu (Tokuno-shima), Tokunoshima-chô, Ôshima-gun, Kagoshima-ken (27.716N, 129.018E*), 24 IV 1954, Kumata-T. (SCM); 2 sex?, China-chô (Okinoerabu-jima), Ôshima-gun, Kagoshima-ken (27.396N, 128.560E*), 24 III 1966, Itô-T. (cHayas).

Other specimens. [**JAPAN**]: 1 sex?, Japan/Mus. Germ. [HW]//trisulcata We. [HW]/det. Bernhauer// Chicago NHMus/M. Bernhauer/Collection. [FMNH]. [**CHINA, Hong Kong**]: 1 male, Tai Long Wan, Lantau Island (22.220N, 113.884E*), 30 III 1997, de Rougemont G. M. (BMNH); 1 sex?, Hong Kong/Waeken Coll/93-58 [HW]/ /China/Brit. Mus. [HW]//trisulcata/Wse. [HW]//Chicago NHMus/M. Bernhauer/Collection. [FMNH].

Redescription. Body (Fig. 53): medium to somewhat large, normally medium sized; extremely robust and heavily sclerotized; very narrowly subparallel sided; entire body shining, but punctured areas of forebody, especially elytra, mat. **Colour** (Figs. 53–56): gland colour black to blackish brown with sometimes lighter colour in elytra; legs, especially tarsal segments, brown to reddish brown; maxillary and labial palpi reddish brown to brownish brown; antennae dark brown and partly reddish brown. **Head** (Fig. 53): longitudinal deep furrows on each side of midline, connected by deep transverse sulci at base. **Antennae** (Fig. 65): thick and quite robust; clearly shorter than combined length of head and pronotum; segment I, nearly 2.2 times as long as broad; segment II

prominently shorter than I; segment III prominently shorter than II; segment IV normally spherical in certain angle; segments V to X strongly transverse; segment XI, about 1.3 times as long as broad; relative length (width) of segments from basal to apical: 10(4.5): 6.5(3): 4.5(3): 2(3): 2(4): 2(4): 2(4): 2(4.5): 2(4.5): 2(4.5): 6(4.5). **Thorax**: pronotum (Figs. 53–54) slightly wider than long (PW/PL =1.19), a little broader than head (PW/HW =1.26); surface blackishly shining without hexagonal reticulations and shallow distinct punctures, but some deep-distinct punctures and prominent longitudinal three furrows along midline forming three-dimensional patterns; impunctured areas largely similar to half-moon shape (without exception, and never cut into completely separated pieces; yellow coloured: Fig. 54), surface of half-moon shining, and located at each side of midline; partly covered with short and thick brown-setae along furrows and deep punctures (white line: Fig. 54); furrows of each side of midline slightly extended toward anterior (blue line: Fig. 54). Inter coxal process of mesoventrite (Figs. 55–56) extremely sharp. Surface of mesoventrite (Figs. 55–56) rough. Inter coxal process of metaventrite (Fig. 55) triangular and pointed above. **Legs** (Fig. 70): hindtibia quite short, about 0.7 times as long as elytra (measured along midline); relative lengths of tarsomeres from basal to apical: 4: 3: 3: 3: 6 in foretarsus, 6: 4: 4: 4: 8 in midtarsus, 8: 5: 5: 5: 10 in hindtarsus. **Abdomen**: posterior margin of tergite VIII (Figs. 71–72), with a row of thick and short several sensory setae.

[**Male**]: posterior margin of tergite VIII (Fig. 71) nearly truncate, with around 8 macrosetae. Sternite VIII (Fig. 73) with about 4 macrosetae and around 5 thin macrosetae; posterior margin produced weakly and medially. Median lobe of aedeagus (Figs. 75–76) compactly elongated, moderately narrowed apically, elongated pyriform in ventral view (Fig. 76); a pair of circular subapico-ventral projections in lateral view (Fig. 75); apical lobe of median lobe extremely short-isosceles shape in ventral view (Fig. 76); flagellum shorter than the whole length of median lobe (Figs. 75–76).

[**Female**]: posterior margin of tergite VIII (Fig. 72) gently rounded or almost truncate, with around 7 macrosetae. Sternite VIII (Fig. 74) with 4 large macrosetae and around 3 thinner macrosetae; posterior margin moderately pointed and no big differences in compared with male. Spermatheca (Fig. 78): spermathecal head large, nearly twice longer than spermathecal stem (sa); spermathecal neck clearly shorter than (sa); basal portion of spermathecal stem distorted, with some bents.

Measurements (male: n=10): BL, 3.12–3.91 (3.62±0.24); FBL, 1.68–1.98 (1.84±0.09); HL, 0.45–0.62 (0.52±0.05); HW, 0.54–0.69 (0.63±0.04); AL, 0.74–0.91 (0.81±0.06); PL, 0.58–0.74 (0.68±0.05); PW, 0.68–0.86 (0.79±0.05); EL, 0.57–0.68 (0.62±0.03); EW, 0.82–0.99 (0.91±0.05); HTL, 0.37–0.54 (0.47±0.05).

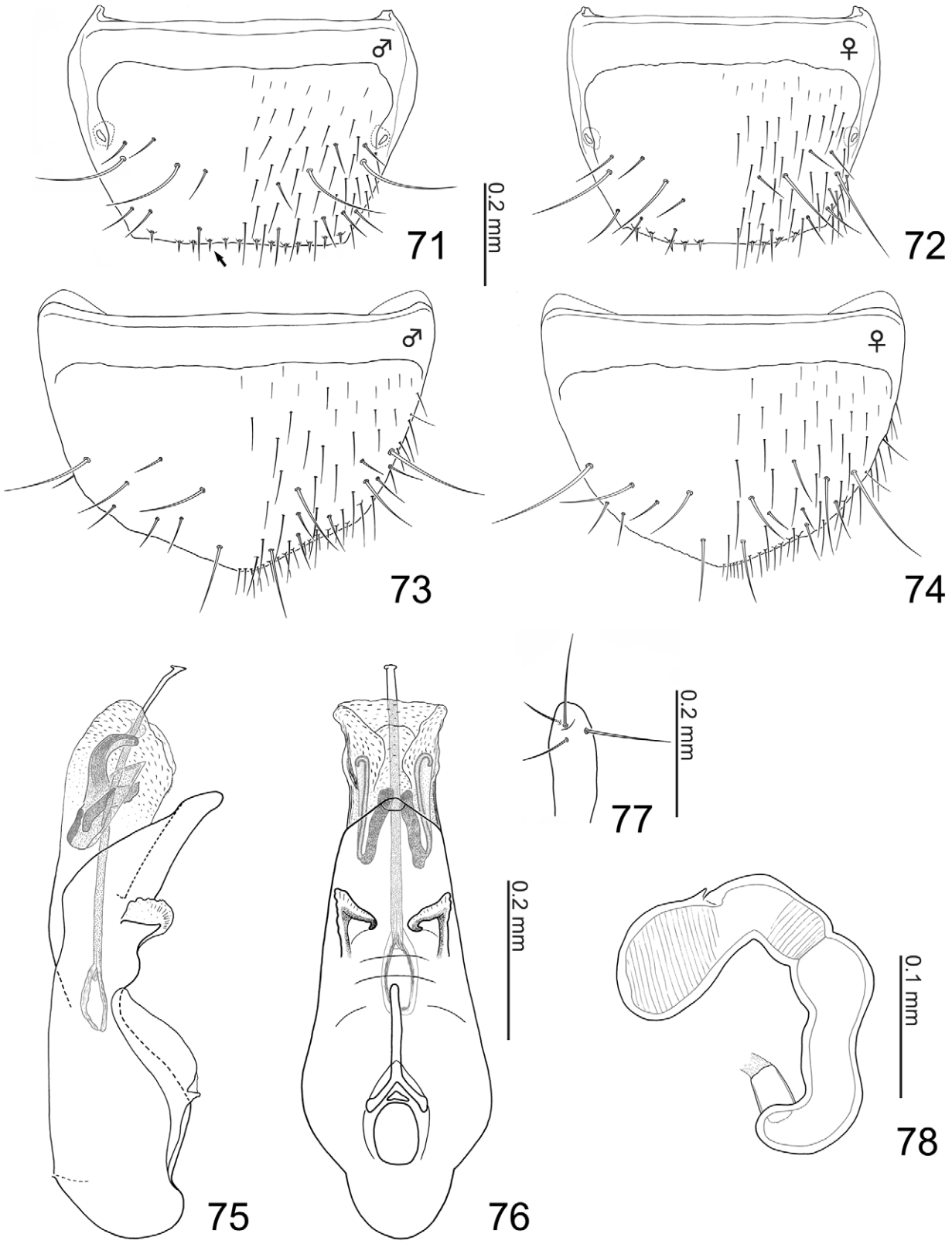
Measurements (female: n=10): BL, 2.84–4.01 (3.34±0.42); FBL, 1.29–1.81 (1.62±0.17); HL, 0.38–0.51 (0.46±0.04); HW, 0.46–0.61 (0.55±0.05); AL, 0.59–0.83 (0.72±0.07); PL, 0.42–0.64 (0.58±0.07); PW, 0.55–0.79 (0.70±0.08); EL, 0.47–0.66 (0.58±0.06); EW, 0.66–0.89 (0.80±0.08); HTL, 0.27–0.48 (0.41±0.05).

Confirmed distribution by authors. [**JAPAN**]: Honshû, Shikoku, Kyûshû, Ryûkyû, Sadoga-shima, Tsu-shima, Tanega-shima, Amami-Ôshima, Tokuno-shima, Okinoerabu-jima (See, Fig. 104 for Japanese distribution); [**CHINA**]: Hong Kong.

Other records in literature. [**SOUTH KOREA**]: Chungnam Province, Jeonnam Province, Jeju Province (Park & Ahn, 2004); [**RUSSIA**]: Far East (Ahn *et al*., 2000; no original citation; doubtful record).

Diagnosis. *Aleochara trisulcata* can be easily distinguished from the other *Triochara* species by a combination of the following character states: dorsal surface of head and pronotum shining; longitudinal subparallel furrows on head connected with a deep furrow at basal head (not shared character in *A. nubis*); impunctured areas on pronotum similar to half-moon shape (never cut into completely separated pieces) and located at each side of midline (details in Fig. 54); furrows on pronotum deep and prominent, never cut into pieces or wavy (Fig. 54); posterior margin of tergite VIII (Figs. 71–72) with a row of thick sensory setae (distinguishable character from *A. zerchei* and *A. nubis*). [**Male**]: a pair of subapico-ventral projections on median lobe of aedeagus circular in lateral view (Fig. 75). [**Female**]: spermathecal stem (bs) (Fig. 78) moderately curved with some bents which is making somewhat similar to M-shape.

Remarks. This species is quite similar to *A. zerchei*, so that reconsideration of the records in the literature from Japan and adjacent regions is needed. For example, Ahn *et al*. (2000) recorded *A. trisulcata* with a short redescription and illustrations of genitalia of both sexes, however, this turned out to be a misidentification of *A. zerchei* by Park and Ahn (2004). In the latter paper, the presence of short longitudinal carina on tergite segments IV to V is mentioned as an important character state of *A. trisulcata*, but we could not confirm this character. They may have misidentified the character states or misjudged them.



FIGURES 71–78. Terminalia of *Aleochara* (*Triochara*) *trisulcata*. 71. tergite VIII of male; 72. tergite VIII of female; 73. sternite VIII of male; 74. sternite VIII of female; 75. male genitalia: median lobe of aedeagus in lateral view; 76. male genitalia: median lobe of aedeagus in ventral view; 77. apical lobe of paramerite, lateral view; 78. female genitalia: spermatheca.

Old records in Hokkaidô and the southern Kuril Islands are possibly misidentification of *Aleochara* (*Triochara*) *zerchei* and *A.* (*T.*) *nubis*. We did not confirm any specimen of true *A. trisulcata* in such regions.

Yamazaki (2008) recorded *Fucellia apicalis* Kertész, 1908 (Diptera, Anthomyiidae) as one of the host species of *A.* (*T.*) *trisulcata* and *A.* (*E.*) *fucicola*. Information on the parasitized months (April, May) is presented in Yamazaki (2012). Pupation takes place in the puparium of its host fly (Yamazaki, 2008, 2012).

Aleochara (*Triochara*) *zerchei* (Assing, 1995)

(Figs. 57–60, 79–85, 105)

Triochara zerchei Assing, 1995: 230 (diagnostic key to species of *Triochara*), 231 (original description; type locality: "RUSSIA: Primorskiy Kray, Ryazanovka, 14km SW Slavyanka, 42.48 N 131.12 E"); Paśnik, 2001: 232 (record from North Korea).

Aleochara (*Triochara*) *zerchei* (Assing, 1995); Maus & Ashe, 1998c (online) (world checklist of subgenus); Maruyama, 2002: 18 (record from Japan (Hokkaidô)); Park & Ahn, 2004: 196 (record from South Korea); Smetana, 2004: 358 (catalogue of Palaearctic species of Aleocharinae); Frank & Ahn, 2011: 10 (figure of living individual), 20 (checklist of coastal Staphylinidae of world).

"*Aleochara* (*Triochara*) *trisulcata* (Weise, 1877)"; Ahn *et al*., 2000: 245 (redescription; as *A. trisulcata*; misidentification of *A. zerchei*, corrected by Park & Ahn (2004)).

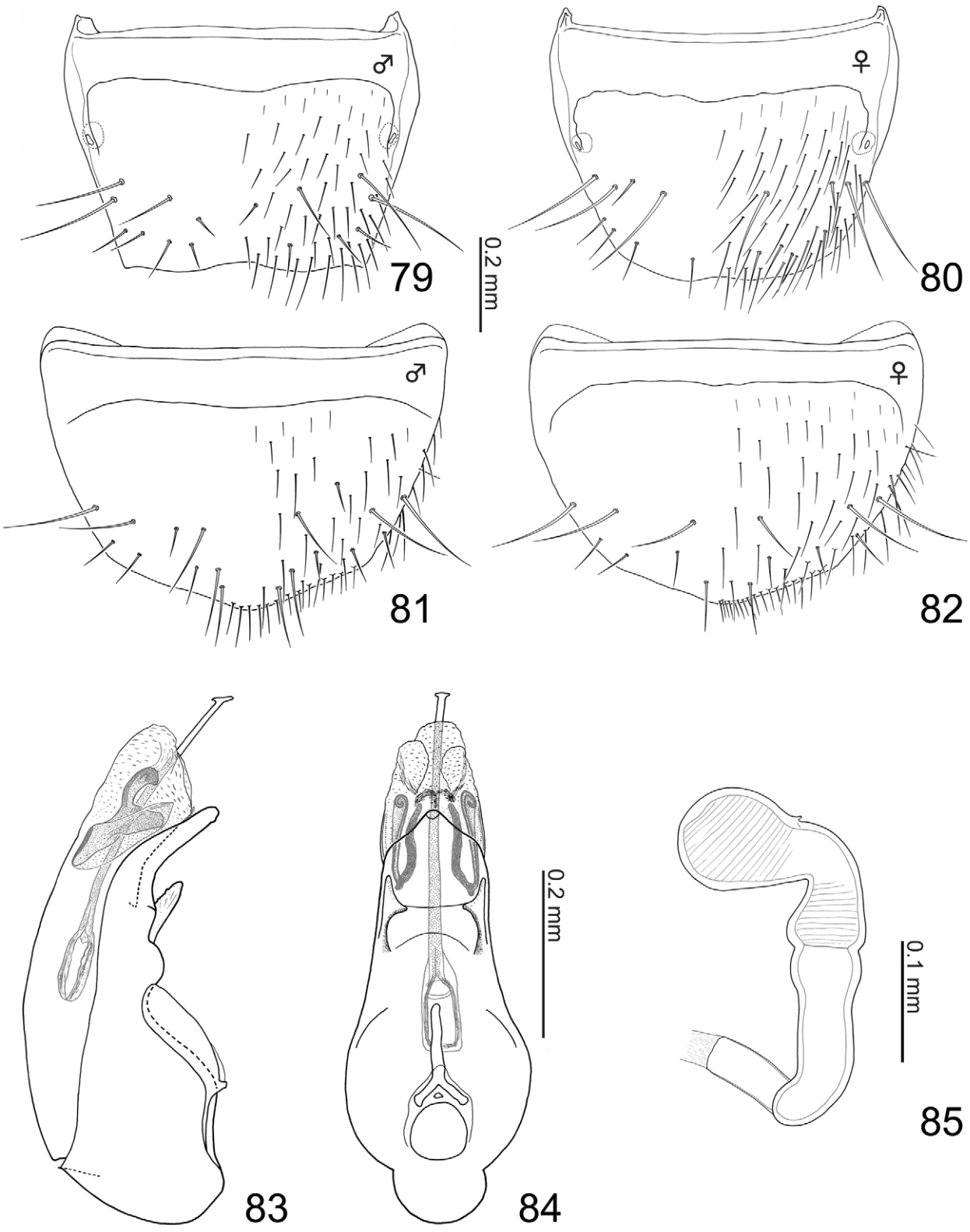
Type specimens. Not examined.

Non-type specimens. JAPAN: **[Hokkaidô]**: 1 ♀, 1 sex?, Yanbetsu (near Nikuru-numa), Koshimizu-chô, Shari-gun (43.918N, 144.538E), 27 VII 1993, Haga-K. (under seaweed on sandy beach; KUM); 4 sex?, Hamakoshimizu, Koshimizu-chô, Shari-gun (43.935N, 144.450E), 3 X 1996, Katô-T. (KUM); 1 ♂, Mokoto (near Mokoto-eki railway station), Abashiri-shi (43.970N, 144.322E), 2 VII 1994, Haga-K. (under seaweed; KUM); 1 sex?, Abashiri, Abashiri-shi (43.979N, 144.304E*); 24 VII 2009, Ôhara-M. (45°58′45″N, 144°18′13″E: mistyping?; under seaweed (*Sargassum* sp.), eel grass (*Zostera* sp.); HUM: HK-09-MO-056/SA); 2 sex?, Koitoi, Shiranuka-chô, Shiranuka-gun (42.982N, 144.163E), 19 VIII 2005, Kishimoto-K. (KUM); 1 sex?, Kotan, Atsuta-ku, Ishikari-shi (43.355N, 141.427E), 9 VII 2009, Ôhara-M. (43°21′18″N, 141°25′37″E; under seaweed on sandy beach; HUM: HK-09-MO-029/SA); 1 ♂, 2 ♀, Zenibako, Otaru-shi (43.144N, 141.161E), 30 V 1977, Nishikawa-N. (KUM); 1 sex?, Minato-machi, Rankoshi-chô, Isoya-gun (42.880N, 140.364E), 23 IV 1999, Sasaki-K. (KUM); 1 sex?, Kojô-hama, Shiraoi-chô, Shiraoi-gun (42.462N, 141.218E), 30 VII 1953, Shuto-S. (SCM); 1 sex?, Nanae-hama, Nanaehama, Hokuto-shi (41.815N, 140.702E), 15 VIII 1977, Nishikawa-N. (KUM). **[Honshû]**: 1 sex?, Kodomariaoiwa, Nakadomari-machi, Kitatsugaru-gun, Aomori-ken (41.165N, 140.329E*), 15 IV 2004, Abe-A. (KUM); 1 sex?, Sichirinaga-hama (near Benzu-numa), Kizukuritateoka, Tsugaru-shi, Aomori-ken (40.867N, 140.286E), 1 VII 2006, Hayashi-M. (sandy beach; cKaw); 1 sex?, Rikuchû-Yagi, Taneichi, Hirono-chô, Kunohe-gun, Iwate-ken (40.349N, 141.764E), 28 VI 2010, Ôhara-M. (40°20′56″N, 141°45′49″E; sandy beach; under seaweed (*Laminaria* sp., *Sargassum* sp.) and eel grass (*Zostera* sp.); HUM: HN-10-MO-044/SA); 1 sex?, Raga, Tanohata-mura, Shimohei-gun, Iwate-ken (39.939N, 141.940E*), 30 V 1998, Watanabe-T. (cWat); 1 sex?, Omoto, Iwaizumi-chô, Shimohei-gun, Iwate-ken (39.850N, 141.974E), 27 VI 2010, Ôhara-M. (39°50′59″N, 141°58′27″E; sandy beach; HUM: HN-10-MO-042/SA); 2 sex?, Idoura bay, Fujizuka, Wakabayashi-ku, Sendai-shi, Miyagi-ken (38.181N, 140.962E), 8 VIII 2009, Ozaki-T. (KUM); 5 sex?, Isohara, Kitaibaraki-shi, Ibaraki-ken (36.790N, 140.752E), 24 V 1998, Ohmomo-S. (KUM); 1 sex?, Hebara, Katuura-shi, Chiba-ken (35.165N, 140.334E), 12 V 1991, Takeda-T. (KUM); 1 ♂, 1 ♀, 1 sex?, Ubara, Katsuura-shi, Chiba-ken (35.137N, 140.275E), 6 IV 1993, Takeda-T. (KUM); 1 sex?, Amatsu-kaigan, Amatsu, Kamogawa-shi, Chiba-ken (35.122N, 140.154E), 3 XI 1990, Takeda-T. (KUM); 1 sex?, Tôjô-kaigan (in front of an aquarium: Kamogawa Seaworld), Higashi-chô, Kamogawa-shi, Chiba-ken (35.115N, 140.121E), 27 IX 1987, Haga-K. (under flotsam on sandy beach; KUM); 1 sex?, Heisaura, Sakai, Tateyama-shi, Chiba-ken (34.948N, 139.801E), 1 IV 1997, Maruyama-M. (cMar); 1 ♂, 1 ♀, 20 sex?, same place, but 26 XII 2007, Ono-H. (cOno); 4 sex?, Miura-shi, Kanagawa-ken (35.180N, 139.655E*), 26 III 1966, Kiryû-R. (SCM); 1 sex?, Kurihama, Yokosuka-shi, Kanagawa-ken (35.225N, 139.713E*), 25 IV 1965, Kiryû-R. (SCM); 1 ♀, Naga-hama swimming beach, Nagai-2chôme 13, Yokosuka-shi, Kanagawa-Ken (35.190N, 139.615E), 7 IV 1975, Tao-M. (KUM); 8 sex?, Hiratsuka beach, Hiratsuka-shi, Kanagawa-ken (35.315N, 139.355E), 28 IX 1958, Sibata-Y. (SCM); 1 ♂, Shônan-kaigan, Kanagawa-Ken (35.315N, 139.351E*), 2 VII 1976, Niizato (KUM); 6 sex?, Tsumekizaki, Shimoda-shi, Shizuoka-ken (34.659N, 138.987E), 21 IV 2003, Maruyama-M. (cMar); 2 sex?, Mukaiawagasaki, Uchinada-machi, Kahoku-gun, Ishikawa-ken (36.640N, 136.622E*), 12 IV 1948, Takaba-S. (cHayas); 1 ♂, 3 sex?, Uchinada-machi, Kahoku-gun, Ishikawa-ken (36.656N, 136.636E*), 15 VI

1961, Hayashi-Y. (cHayas); 1 ♂, 1 sex?, Kanaiwa, Kanazawa-shi, Ishikawa-ken (36.607N, 136.589E), 15 VII 1961, Hayashi-Y. (cHayas); 27 sex?, Echizen-kaigan, Fukui-ken (36.036N, 136.012E*), 17 IX 2001, Hoshina-H. (sandy beach; under wood logs; KUM); 1 sex?, river mouth of Kushida-gawa, Matsunase-chô, Matsuzaka-shi, Mie-ken (34.605N, 136.582E), 28 IV 2002, Kawakami-Y. (cKaw); 2 sex?, Nagusano-hama, Kemi, Wakayama-shi, Wakayama-ken (34.165N, 135.182E), 14 V 2002, Kawakami-Y. (cKaw); 1 sex?, Kada-kaigan, Kada, Wakayama-shi, Wakayama-ken (34.280N, 135.074E), 19 IV 2003, Kawakami-Y. (cHayas); 1 ♀, Takashino-hama, Takaishi-shi, Ôsaka-fu (34.531N, 135.432E), 4 IX 1958, Kimura-Y. (cHayas); 1 ♂, 2 ♀, 4 sex?, Hamadera, Nishi-ku, Sakai-shi, Ôsaka-fu (34.543N, 135.439E), 5 V 1965, Itô-T. (cHayas); 1 ♀, 1 sex?, shores of Sakai, Ôsaka-fu (34.582N, 135.465E*), 20 VI 1956, Sawada-K. (cHayas); 1 ♀, 12 sex?, Minato-ku, Ôsaka-shi, Ôsaka-fu (34.667N, 135.447E), 7 IV 1957, Shibata-T. (cHayas); 1 ♂, 7 sex?, Nishinomiya, Hyôgo-ken (34.724N, 135.331E), 14 IV 1957, Shibata-T. (cHayas); 2 sex?, Kôshien-hama, Kôshienhama-1chôme, Nishinomiya-shi, Hyôgo-ken (34.712N, 135.349E), 27 V 1998, Kawakami-Y. (cKaw); 1 sex?, same data, but 29 IV 2003; 2 sex?, Sumaura-kaigan, Sumauradôri, Suma-ku, Kôbe-shi, Hyôgo-ken (34.637N, 135.103E), 19 IV 1998, Kawakami-Y. (cKaw); 1 ♂, same data, but 27 V 2010; 1 sex?, Gunge-hama (Awaji-shima), Gunge, Awaji-shi, Hyôgo-ken (34.475N, 134.845E), 5 V 2000, Kawakami-Y. (cKaw); 1 sex?, Marutahama coast (Awaji-shima), Amanishi-machi, Minamiawaji-shi, Hyôgo-ken (34.201N, 134.732E), 13 V 1998, Kawakami-Y. (cKaw); 1 sex?, Matue-kaigan, Matsue, Akashi-shi, Hyôgo-ken (34.654N, 134.955E), 10 V 1998, Kawakami-Y. (cKaw); 3 sex?, Yagi, Ôkubo-chô, Akashi-shi, Hyôgo-ken (34.670N, 134.933E), 9 V 1999, Kawakami-Y. (cKaw); 4 sex?, river mouth of Kako-gawa, Youta, Onoe-chô, Kakogawa-shi, Hyôgo-ken (34.737N, 134.811E), 1 VI 1999, Kawakami-Y. (cKaw); 4 ♂, 1 ♀, Matogata-kaigan, Matogata, Matogata-chô, Himeji-shi, Hyôgo-ken (34.769N, 134.746E), 16 V 2010, Kawakami-Y. (cKaw); 2 sex?, Kugui, Higashi-ku, Okayama-shi, Okayama-ken (34.584N, 134.086E*), 31 III 2003, Fujitani-Y. (KUM); 13 sex?, same data, but 9 V 2003 (under seaweed on beach); 13 sex?, same data, but 28 V 2003; 2 ♂, 2 ♀, 1 sex?, Kogushi, Minami-ku, Okayama-shi, Okayama-ken (34.591N, 134.037E), 11 III 1977, Watanabe-A. (KUM); 1 ♂, Inazumi, Sugeura, Mihonoseki-chô, Matue-shi, Shimane-ken (35.564N, 133.166E*), 1-2 VI 2008, Hayama-T. (sandy beach; cHayam); 4 sex?, Sotozono-kaigan, Sashiumi, Koryô-chô, Izumo-shi, Shimane-ken (35.333N, 132.664E), 12-13 IV 2009, Hayama-T. (under seaweed; cHayam); 1 sex?, Kuromatsu-chô, Gôtsu-shi, Shimane-ken (132.310N, 35.057E), 2 V 2009, Hayama-T. (from seaweed; cHayam); 11 sex?, Kiami-chô, Masuda-shi, Shimane-ken (34.676N, 131.750E*), 15-16 VI 2008, Hayama-T. (FIT on supratidal zone; cHayam); 1 sex?, same locality, but 10 V 2009, Hayama-T. (cHayam); 1 sex?, Chûdô coast, Aiohigashi, Yamaguchi-shi, Yamaguchi-ken (33.996N, 131.450E), 4 V 2003, Kawakami-Y. (cKaw). **[Shikoku]**: 13 sex?, Tosadomariura (Ôge-jima), Naruto-chô, Naruto-shi, Tokushima-ken (34.232N, 134.639E), 29 IX 1972, Tomokuni-M. and Sakai-M. (EEEU); 1 sex?, river mouth of Yoshino-gawa (between Nada-bashi bridge and Daijû-zeki sluice), Tokushima-shi, Tokushima-ken (34.089N, 134.561E), 3 V 1999, Kawakami-Y. (cKaw); 3 sex?, estuary of Yoshino-gawa, Tokushima-shi, Tokushima-ken (34.074N, 134.595E*), 15 V 2007, Changdo-H. (EEEU); 1 sex?, Ôura, Matsuyama-shi, Ehime-ken (33.996N, 132.771E), 15 IV 2010, Kawakami-Y. (cKaw); 1 sex?, Takahama-machi, Matsuyama-shi, Ehime-ken (33.898N, 132.709E*), 14 V 2002, Kurihara-T. (sandy beach; EEEU); 1 sex?, Mori, Iyo-shi, Ehime-ken (33.740N, 132.678E), 20 III 2001, Sakai-M. (EEEU). **[Kyûshû]**: 10 sex?, Noko (Nokono-shima), Nishi-ku, Fukuoka-shi, Fukuoka-ken (33.608N, 130.299E*), 13 V 1998, Fujimoto-H. (KUM); 1 sex?, same locality, but 4 V 2008, Ôkawa-A. (KUM); 1 sex?, same place name (33.608N, 130.299E), but 20 III 2009, Yamamoto-S. (from a seaweed mass on sandy beach with *Aleochara* (*Emplenota*) *segregata* and *A.* (*T.*) *trisulcata*; cYam).

Other specimens. JAPAN: 2 sex? (specimens on the same paper card), Japan./G Lewis./1910-320.// Aleochara/trisulcata/Weise [HW]//Chicago Nat. Hist. Mus. (ex. D. Sharp Colln./by exchange with/Brit. Mus. Nat. Hist.) [FMNH]; 1 sex?, Japan/mus./germ. [HW]//trisulcata Ws [HW]/det. Bernhauer//Chicago NHMus/M. Bernhauer/Collection. [FMNH]; 1 sex?, trisulcata/Wse. Japan/Standinger [HW]//Chicago NHMus/M. Bernhauer/Collection. [FMNH]; 1 sex?, aleochara/trisulcata Wse/Japan./V. Standinger [HW]//Chicago NHMus/M. Bernhauer/Collection. [FMNH]; 3 sex?, BEPPU/NO.-KIUSHIU [Beppu-shi, Ôita-ken, Kyûshû]//Japan/Reitter.//Chicago NHMus/M. Bernhauer/Collection. [FMNH]; 1 sex?, BEPPU/NE-KYUSHU [Beppu-shi, Ôita-ken, Kyûshû]//Japan/Reitter//trisulcata Ws. [HW]/det. Bernhau//Chicago NHMus/M. Bernhauer/Colletion. [FMNH]; 2 sex?, BEPPU/NE-KYUSHU//Japan/Reitter.//Chicago NHMu/M. Bernauer/Collection. [FMNH]. **RUSSIA**: **Kuril Islands**: [**Urup Is.**]: 1 ♂, 3 ♀, 5 sex?, near river mouth of Bystraya, Novo-Kurylisk bay (46.223N, 150.319E), 8 VIII 1995, Ôhara-M. (46°12′84″N, 150°18′69″E; hand pick up; feces of cows; IKIP; HUM: UR-95-MO-8); 1 ♂, Otkrytyy bay (45.864N, 149.793E), 4 VIII 1995, Ôhara-M. (N45°51′49″, E149°46′95″; hand pick up; under logs and rocks on

shore; HUM: UR-95-MO-002); 1 ♂, Otkrytyy bay (45.851N, 149.770E), 5 VIII 1995, Ôhara-M. (45°51′04″N, 149°46′12″E; under logs and rocks on shore; HUM: UR-95-MO-005).



FIGURES 79–85. Terminalia of *Aleochara* (*Triochara*) *zerchei*. 79. tergite VIII of male; 80. tergite VIII of female; 81. sternite VIII of male; 82. sternite VIII of female; 83. male genitalia: median lobe of aedeagus in lateral view; 84. male genitalia: median lobe of aedeagus in ventral view; 85. female genitalia: spermatheca.

Redescription. Body (Fig. 57): small to somewhat large, normally medium sized; strongly sclerotized; narrowly subparallel sided but moderately thick; entire body shining somewhat strongly, but some individuals shining weakly due to scratches or rough surface entirely. **Colour** (Figs. 57–60): gland colour light black to grayish brown with almost same (sometimes lighter) colour in elytra; legs, especially tarsal segments, light brown to reddish brown: maxillary and labial palpi reddish brown to brownish brown; antennae dark brown to reddish brown. **Head** (Fig. 57): longitudinal deep furrows on each side of midline, connected by somewhat deep transverse impression (or furrow) at base. **Antennae**: moderately thick and quite robust; clearly shorter than combined length of head and pronotum; segment I, about 1.9 times as long as broad; segment II clearly shorter than I; segment III prominently shorter than II; segment IV spherically transverse; segment V to X strongly transverse; segment XI, about 1.5 times as long as broad; relative length (width) of segments from basal to apical: 9.5(5): 6(4): 5.5(3.5): 3(3.5): 3(4): 3(5): 3(5): 3(5.5): 3(5.5): 3.5(6): 7.5(5). **Thorax**: pronotum (Figs. 57–58) slightly wider than long (PW/PL =1.17), a little broader than head (PW/HW =1.32); surface blackishly shining in most cases, but sometimes nearly mat because of numerous scratches or many large punctures, or too many undulations making rough surface in somecases; dorsal surface lack of hexagonal reticulations as well as shallow distinct punctures, but some deep-distinct punctures and shallow-waving furrows forming three-dimensional patterns; patterns very diverse and varying greatly within the species, [Typical type (see, Fig. 58)]: impunctured area largely similar to half-moon shape on each side, but with cutting off by an oblique row of setae or punctures around middle of each half-moon pattern, forming two pairs of impunctured areas (yellow coloured: Fig. 58), [Other types]: patterns irregular and each impunctured area small and inconspicuous, or lack of impunctured area and having rough surface entirely in some cases; longitudinal three furrows along midline, sometimes weak, wavy and inconspicuous (blue line: Fig. 58). Inter coxal process of mesoventrite (Figs. 59–60) elongated and subparallel sided with rounded apex. Surface of mesoventrite (Figs. 59–60) mat and weakly shining. Inter coxal process of metaventrite (Fig. 59) quite short with rounded anterior margin, about 1/4 as long as mesocoxal cavity. **Legs**: midtibia as long as metaventrite; hindtibia short, about 0.8 times as long as elytra; relative lengths of tarsomeres from basal to apical: 6: 3: 3: 3: 7 in foretarsus, 7: 4: 4: 4: 10 in midtarsus, 8: 5: 5: 5: 11 in hindtarsus. **Abdomen**: posterior margin of tergite VIII (Figs. 79–80), with a row of thin and long several sensory setae.

[**Male**]: posterior margin of tergite VIII (Fig. 79) nearly truncate or wavy, with around 8 macrosetae. Sternite VIII (Fig. 81) with about 5 large macrosetae and around 4 thin macrosetae; posterior margin produced weakly and medially. Median lobe of aedeagus (Figs. 83–84) compactly elongated, elongated pyriform in ventral view (Fig. 84); a pair of subapico-ventral projections sharply pointed in lateral view (Fig. 83); apical lobe of median lobe extremely short-isosceles shape in ventral view (Fig. 84); flagellum nearly as same length as the whole length of median lobe (Figs. 83–84).

[**Female**]: tergite VIII (Fig. 80) gently rounded toward posterior and slightly emarginated medially, with around 3 large macrosetae and around 5 thin macrosetae. Sternite VIII (Fig. 82) with 4 large macrosetae and around 3 thinner macrosetae; posterior margin very weakly pointed. Spermatheca (Fig. 85): spermathecal head large, about twice longer than apical portion of spermathecal stem (sa); spermathecal neck inconspicuous, clearly shorter than (sa); basal portion of spermathecal stem simple.

Measurements (male: n=10): BL, 3.19–3.91 (3.62±0.25); FBL, 1.55–2.00 (1.79±0.14); HL, 0.44–0.58 (0.51±0.04); HW, 0.52–0.67 (0.61±0.05); AL, 0.77–0.92 (0.83±0.05); PL, 0.61–0.78 (0.70±0.06); PW, 0.70–0.89 (0.81±0.07); EL, 0.55–0.78 (0.64±0.07); EW, 0.89–1.02 (0.95±0.05); HTL, 0.44–0.55 (0.51±0.04).

Measurements (female: n=10): BL, 3.19–4.47 (3.79±0.49); FBL, 1.58–2.09 (1.82±0.18); HL, 0.43–0.57 (0.49±0.05); HW, 0.51–0.67 (0.60±0.05); AL, 0.69–0.83 (0.75±0.05); PL, 0.58–0.75 (0.67±0.05); PW, 0.70–0.89 (0.79±0.06); EL, 0.55–0.73 (0.66±0.06); EW, 0.82–1.09 (0.93±0.09); HTL, 0.43–0.55 (0.49±0.04).

Confirmed distribution by authors. [**JAPAN**]: Hokkaidô, Honshû, Shikoku, Kyûshû, Awaji-shima (See, Fig. 105 for Japanese distribution); [**RUSSIA**]: **Kuril Islands**: Urup Is.

Other localities in literature. [**SOUTH KOREA**]: Gangwon (Kangwon) Province, North Gyeongsang Province, Jeju Province (Ahn *et al*., 2000: as *A. trisulcata*; Park & Ahn, 2004); [**NORTH KOREA**]: Chagang Province (Paśnik, 2001); [**RUSSIA**]: Far East: Sakhalin, Primorsky Krai (Assing, 1995).

Diagnosis. This species is extremely similar to the former species, *Aleochara trisulcata*, in many points especially in external appearance. However, our study revealed some important character states to distinguish *A. zerchei* from other two species as follows: longitudinal subparallel furrows on head connected with a somewhat deep impression (not by a clearly sharrow and incospicuous furrow); impunctured area on pronotum (Fig. 58)

largely similar to a half-moon shape on each side, but with cutting off by an oblique row of setae around middle of each half-moon pattern, or lacking impunctured areas and having rough surface entirely; longitudinal sulci on dorsal surface of pronotum shallow, sometimes more or less making wavy lines (Fig. 58); posterior margin of tergite VIII (Figs. 79–80) lack of a row of thick sensory setae but instead have thin and long setae. [**Male**]: posterior margin of sternite VIII (Fig. 81) weakly pointed; a pair of subapico-ventral projections on median lobe narrowly and sharply pointed in lateral view (Fig. 83). [**Female**]: base of spermathecal stem (sb) (Fig. 85) very simple and not strongly curved.

Remarks. This species is sympatrically distributed with *A. trisulcata* in most localities in Japan, although *A. zerchei* was known only from Hokkaidô by the previous study (Maruyama, 2002). Ahn *et al*. (2000) misidentified *A. zerchei* as *A. trisulcata* and this was later corrected by Park and Ahn (2004) as *A. zerchei* in combination with real records of *A. trisulcata*. *Aleochara zerchei* and *A. trisulcata* have often been confused, and re-examination of the material used in the previous studies is needed.

Aleochara (*Triochara*) *nubis* (Assing, 1995)

(Figs. 61–64, 86–92, 98–100, 104)

Triochara nubis Assing, 1995: 230 (diagnostic key to species of genus), 232 (original description; type locality: "RUSSIA, Sakhalin, Korsakov distr., Ismenhyroye lake"); Naomi *et al*., 2000: 107 (record from Paramushir Is., Kuril Islands).

Aleochara (*Triochara*) *nubis* (Assing, 1995); Maus & Ashe, 1998c (online) (world checklist of subgenus; bionomics); Maruyama, 2002: 18 (record from Japan (Hokkaidô)); Smetana, 2004: 358 (catalogue of Palaearctic species of Aleocharinae); Frank & Ahn, 2011: 20 (checklist of coastal Staphylinidae of world).

Type specimens. Not examined.

Non-type specimens. JAPAN: **[Hokkaidô]**: 3 ♂, 1 ♀, 4 sex?, Hamamatsu, Nemuro-shi (43.206N, 145.528E), 14 VI 2010, Yamamoto-S. (under seaweed on sandy beach; cYam); 2 sex?, Ochiishi, Nemuro-shi (43.607N, 145.286E*), 24 VIII 1999, Maruyama-M. (under seaweed on sandy beach; cMar); 1 sex?, Notsuke (Notsuke-zaki peninsulae), Betsukai-chô, Notsuke-gun (43.607N, 145.286E), 14 IX 2009, Ôhara-M., Yamamoto-H. and Furuta-M. (43°36′26″N, 145°17′08″E; under seaweed (*Laminaria* sp.) and eel grass (*Zostera* sp.); HUM: HK-09-MO-100/SI); 1 ♂, 2 ♀, Shibetsu, Nemuro-shi (43.656N, 145.136E*), 18 VII 1977, Naomi-S.I. (KUM); 1 sex?, Koitoi, Shiranuka-chô, Shiranuka-gun, (42.982N, 144.163E), 19 VIII 2005, Kishimoto-K. (KUM); 1 sex?, Ôtsuminato-machi, Toyokoro-chô, Nakagawa-gun (42.667N, 143.628E), 26 VII 2009, Ôhara-M. (42°40′02″N, 143°37′41″E; under seaweed (*Sargassum* sp.); HUM: HK-09-MO-059/SA); 1 sex?, Ôkishi (near Ôkishi tunnel), Toyoura-chô, Abuta-gun (42.587N, 140.675E*), 15 IX 1997, Ôhara-M. (under seaweed on beach; KUM); 1 sex?, Sawara, Mori-machi, Kayabe-gun (42.123N, 140.647E), 15 VII 2009, Ôhara-M. (42°07′23″N, 140°38′50″E; under seaweed (*Sargassum* sp.); HUM: HK-09-MO-040/SA).

Other specimens. RUSSIA: **Kuril Islands**: [**Paramushir Is.**]: 4 ♂, 8 ♀, Medvezhiy Waterfall, Shelekhovo (50.367N-50.378N, 155.611E-155.656E), 18 VII 1997, Saitô-A. (50°22.012′N -50°22.694′N, 155°36.677′E - 155°39.380′E; alt. 0-10m; CBM: CBM-ZI 81532(-81543)). [**Kharimkotan Is.**]: 3 sex?, Severgine bay (49.181N, 154.466E), 8 VIII 1996, Ôhara-M. (49°10′51″N, 154°27′59″E; hand picking; under pebble and logs on sandy beach; IKIP; HUM: KH-96-MO-022B). [**Kraternaya Ysnkicha Is.**]: 5 ♂, 2 ♀, 25 sex?, at entrance of the island (47.515N, 152.817E), 14 VIII 1995, Ôhara-M. (47°30′54″N, 152°49′00″E; IKIP; HUM: US-95-MO-021). [**Simshir Is.**]: 1 ♀, Malaya bay (47.087N, 152.131E), 18 VIII 1995, Ôhara-M. (N47°05′14″, E152°07′51″; hand pick up; under logs and rocks on shore; IKIP; HUM: SI-95-MO-032). [**Chirupoi Is.**]: 1 ♂, 1 sex?, Peschanaya bay (46.548N, 150.906E), 23 VIII 1995, Ôhara-M. (46°32′53″N, 150°54′22″E; under seaweed on sandy beach; IKIP; HUM: CH-95-MO-048). [**Urup Is.**]: 1 sex?, inland coastal margin of Natalie bay, envisions of Obzhitaya river, in small cave of rockface near river mouth at east end of cove (46.101N, 150.175E), 7 VIII 1995, Urbain-B.K. (46°05′85″N, 150°09′91″E; by hand with forceps; in, on, and under rocks in and around small cave along coast; alt. 1m; IKIP; HUM: UR-95-BKU-028); 1 ♂, near mouth of Vesetaya river, Natalii bay (46.094N, 150.142E), 6 VIII 1995, Ôhara-M. (46°05′38″N, 150°08′33″E; hand pick up; under rocks; IKIP; HUM: UR-95-MO-006); 1 ♂, inland coastal margin of Otkrytyi bay; environs of Shabalina river (45.864N, 149.794E), 4 VIII 1995 (15:00-16:00), Urbain-B.K. (45°51′51″N, 149°46′99″E; by hand; along coastal beach with fine sand; under logs; alt. 2m; sand temperature: 15 degree celcius; IKIP; HUM: UR-95-BKU-014); 1 ♂, 1 ♀, Otkrytyy bay (45.864N, 149.793E), 4

VIII 1995, Ôhara-M. (45°51′49″N, 149°46′95″E; under logs and rocks on shore; IKIP; HUM: UR-95-MO-002); 1 sex?, Tokotan, Otkrytyy bay (45.864N, 149.793E), 4 VIII 1995, Ôhara-M. (45°51′49″N, 149°46′95″E; under logs and rocks on shore; IKIP; HUM: UR-95-MO-001); 1 ♂, 6 sex?, Otkrytyy bay (45.851N, 149.770E), 5 VIII 1995, Ôhara-M. (45°51′04″N, 149°46′12″E; under seaweed along seashore; IKIP; HUM: UR-95-MO-005).

Redescription. Body (Fig. 61): small to large size, normally somewhat large; extremely robust and strongly sclerotized; somewhat thick but narrowly elongated; dorsal surface of entire body except for abdomen mat due to large hexagonal microstructures. **Colour** (Figs. 61–64): gland colour grayish black to dark gray with almost same (sometimes lighter) colour in elytra; legs, especially tarsal segments, brown to reddish brown: maxillary and labial palpi reddish brown to brownish brown; antennae dark brown to reddish brown. **Head** (Fig. 61): longitudinal deep furrows on each side of midline, connected by shallow transverse impression at base; dorsal surface with large hexagonal reticulations. **Antennae**: relatively thick and quite robust; shorter than combined length of head and pronotum; segment I, about 2.3 times as long as width; segment II prominently shorter than I, and strongly and apically dilated; segment III prominently shorter than II; segment IV slightly transverse; segment V to X moderately transverse; segment XI, about 1.3 times as long as broad; relative length (width) of segments from basal to apical: 9(4): 6(3): 4(3): 2.5(3.5): 2.5(4): 3(4.5): 3(4.5): 3(5): 3(5): 3.5(5): 6.5(5). **Thorax**: pronotum (Figs. 61–62) slightly wider than long (PW/PL =1.20), a little broader than head (PW/HW =1.28); somewhat constricted both apical and posterior margin; surface blackishly, but weakly shining due to large hexagonal microstructures on entire surface and shallow punctures with setae (connected with white line: Fig. 62); shallow punctures and furrows forming three-dimensional pattern; patterns diverse and varying within the species, [Typical type (see, Fig. 62)]: each of impunctured area largely similar to half-moon shape and elevated like dooms (yellow coloured: Fig. 62) and lack of cutting off by a row of setae around middle of each half-moon pattern, [Other type]: patterns irregular (not half-moon shape as in Fig. 62) and slightly elevated above; dorsal surface with longitudinal three somewhat deep and straight furrows along midline (blue line: Fig. 62). Inter coxal process of mesoventrite (Fig. 63) elongated and somewhat sharply pointed. Surface of mesoventrite (Figs. 63–64) somewhat rough and shining weakly. Inter coxal process of metaventrite (Fig. 63) short with rounded anterior margin. **Legs**: hindtibia short, about 0.9 times as long as elytra (measured along midline); relative lengths of tarsomeres from basal to apical: 6: 4: 4: 4: 8 in foretarsus, 8: 5: 5: 5: 10 in midtarsus, 10: 6: 6: 6: 12 in hindtarsus. **Abdomen**: posterior margin of tergite VIII (Figs. 86–87), with a row of thin and long several sensory setae; surface of tergite VIII and sternite VIII pubescent.

[**Male**]: posterior margin of tergite VIII (Fig. 86) almost truncate or slightly emarginated medially, with around 11 macrosetae. Sternite VIII (Fig. 88) with about 5 macrosetae and around 8 thin macrosetae; posterior margin pointed triangularly. Median lobe of aedeagus (Figs. 90–91) elongated, moderately narrowed apically, elongated pyriform in ventral view (Fig. 91); a pair of pointed large and oval subapico-ventral projections in lateral view (Fig. 90); apical lobe of median lobe isosceles shape in ventral view (Fig. 91); flagellum slightly shorter than the whole length of median lobe (Figs. 90–91).

[**Female**]: posterior margin of tergite VIII (Fig. 87) nearly truncate, with around 3 macrosetae and around 5 thin macrosetae. Posterior margin of sternite VIII weakly pointed (Fig. 89) with 4 large macrosetae and around 4 thinner macrosetae. Spermatheca (Fig. 92): head (sh) thick and large, more than twice longer than apical portion of spermathecal stem; spermathecal neck extremely short; basal portion of spermathecal stem narrowing toward base, with strong bent (<90°).

Measurements (male: n=10): BL, 3.72–4.95 (4.39±0.45); FBL, 1.82–2.23 (2.04±0.14); HL, 0.53–0.65 (0.61±0.04); HW, 0.61–0.74 (0.68±0.04); AL, 0.79–1.07 (0.96±0.09); PL, 0.64–0.81 (0.74±0.06); PW, 0.77–0.97 (0.89±0.07); EL, 0.66–0.80 (0.72±0.05); EW, 0.89–1.13 (1.03±0.08); HTL, 0.49–0.65 (0.59±0.05).

Measurements (female: n=10): BL, 3.34–5.00 (4.12±0.50); FBL, 1.86–2.24 (2.05±0.11); HL, 0.54–0.72 (0.61±0.05); HW, 0.63–0.79 (0.70±0.04); AL, 0.82–1.11 (0.93±0.09); PL, 0.62–0.87 (0.73±0.07); PW, 0.78–1.01 (0.88±0.06); EL, 0.62–0.80 (0.71±0.05); EW, 0.91–1.23 (1.03±0.09); HTL, 0.49–0.70 (0.57±0.06).

Confirmed distribution by authors. [**JAPAN**]: Hokkaidô (see, Fig. 104); [**RUSSIA**]: Kuril Islands: Paramushir Is., Kharimkotan Is., Kraternaya Ysnkicha Is., Simshir Is., Chirupoi Is., Urup Is.

Other localities in literature. [**RUSSIA**]: Far East: Sakhalin, Kamchatka Peninsula (Assing, 1995).

Diagnosis. *Aleochara* (*Triochara*) *nubis* is similar to *A. zerchei* in many points (e.g., posterior margin of tergite VIII in both sexes without a row of thick sensory setae). Although they share many characteristics, we found out some distinctions: distribution restricted to northern area (Hokkaidô, Japan (see, Fig. 104); Russian Far East; North Korea); usually large species, occasionally small; dorsal surface of forebody mat and not strongly shining;

longitudinal subparallel furrows on head connected with a shallow impression (not by a deep furrow); impunctured areas (or lacking of that areas) on pronotum (Fig. 62) greatly varying within species, but prominent microstructures and hexagonal reticulations on dorsal surface; longitudinal sulci on dorsal surface of pronotum (Fig. 62) deep, normally straight lines; posterior margin of tergite VIII (Figs. 86–87) with a row of thin and long sensory setae as in *A. zerchei*; surface of both tergite VIII and sternite VIII (Figs. 86–89) pubescent. [**Male**]: posterior margin of sternite VIII (Fig. 88) pointed triangularly; subapico-ventral projections on median lobe of aedeagus large and oval, pointed apical-laterally in lateral aspect (Fig. 90). [**Female**]: base of (sb) very strongly curved (Fig. 92).

Remarks. Assing (1995) described this halophilous species from Sakhalin and Kamchatka Peninsula, Russia, and Maruyama (2002) later recorded it for the first time from Japan (Hokkaidô). Naomi *et al*. (2000) reported *A. nubis* from the Kuril Islands, but only from Paramushir Island. In this study, we present several new distributional records for the Kuril Islands. Our data suggest a wide ranging distribution for *A. nubis* throughout Far East Russia to Hokkaidô. These records also show that *A. nubis* is distributed only in the subarctic zone in East Asia. No specimen has been found from Honshû, Kyûshû, or Ryûkyû in Japan (see, Fig. 104). Mating behaviour (Fig. 100) was observed under drifted seaweed at Hamamatsu (Hokkaidô) (see, bionomics and distribution of *Triochara*).

Key to the Japanese species of the subgenus *Triochara*

1. Body normally large (Mean: 4.30 mm). Dorsal surface of forebody mat because of large microreticulations. Collected in northeastern regions such as the Russian Far East and Hokkaidô, Japan (Fig. 104).

(1) Subpallarel sulci on head, connected by a sharrow depression at the base of head. Inter coxal process of mesoventrite somewhat sharply pointed (Fig. 64). Posterior margin of tergite VIII (Figs. 86–87) with a row of thin and long sensory setae. [**Male**]: subapico-ventral projections on median lobe large and oval, pointed apical-laterally (Fig. 90). [**Female**]: basal portion of spermathecal stem (sb) (Fig. 92) with a strong bent at base. . . . . *Aleochara* (*Triochara*) *nubis*

- **Body small to medium (Mean: 3.59 mm). Surface more or less shining. 2**

2. Surface of pronotum diverse, normally with two pairs of impunctured areas (Fig. 58) or having rough surface entirely. Longitudinal three furrows on surface of pronotum shallow and wavy (Fig. 58).

(2) Apex of inter coxal process of mesoventrite subpararell sided (Fig. 60). Posterior margin of tergite VIII (Figs. 79–80) with a row of thin and long sensory setae. [**Male**]: subapico-ventral projections on median lobe of aedagus sharply pointed (Fig. 83). [**Female**]: basal portion of spermathecal stem (sb) (Fig. 85) simple without some prominent bents. . . . . .*A.* (*T.*) *zerchei*

- **Microstructures on dorsal surface of forebody minute (surface shining). Longitudinal three furrows on pronotum deep and straight (slightly extended anteriorly; Fig. 54)**

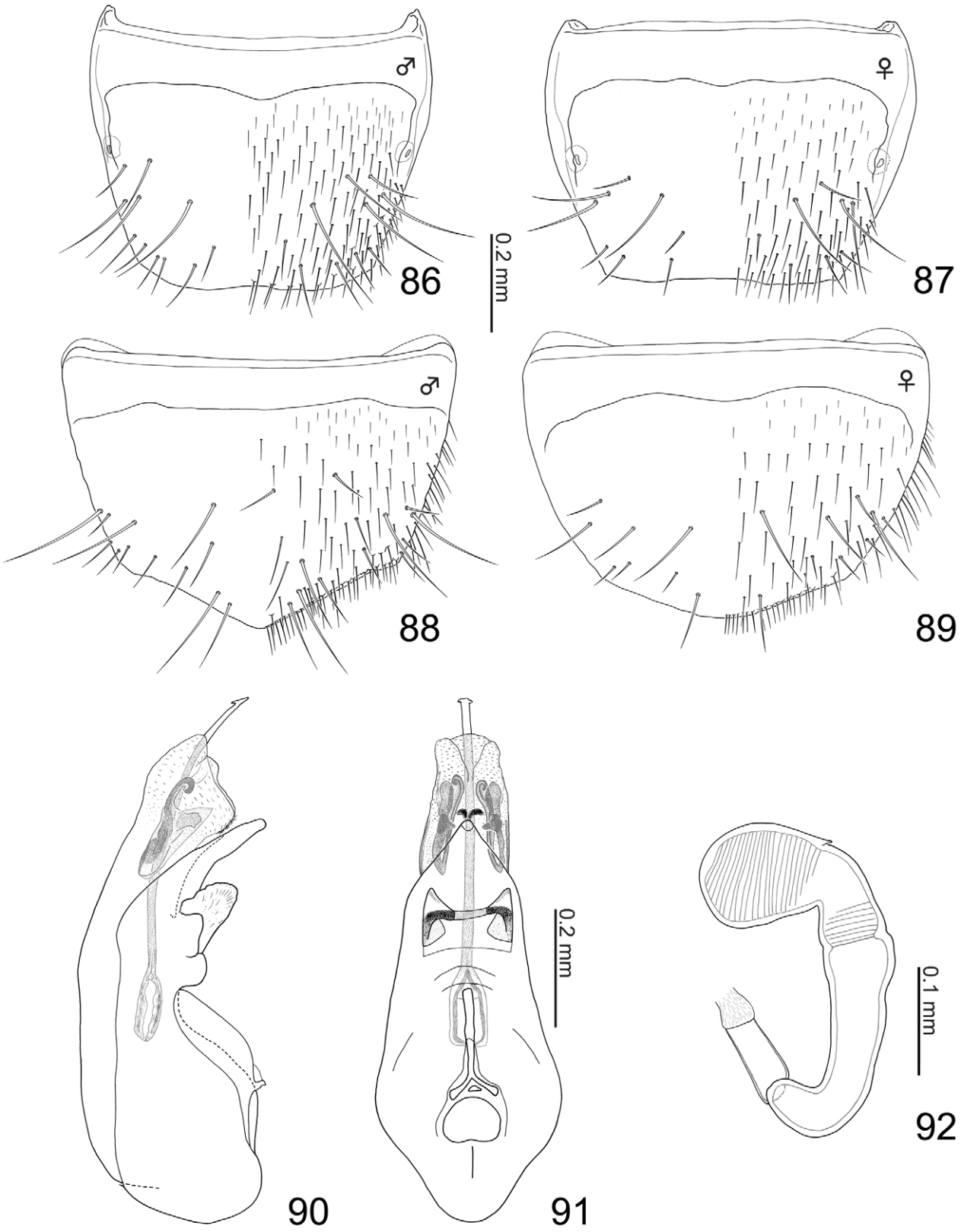
Longitudinal subparallel furrows on head connected with a deep furrow or impression. Impunctured area on pronotum (Fig. 54) largely similar to a half-moon shape and situated on each side of midline. Inter coxal process of mesoventrite sharply pointed. Posterior margin of tergite VIII (Figs. 71–72) with a row of thick sensory setae. [**Male**]: subapico-ventral projections on median lobe circular shape in lateral view (Fig. 75). [**Female**]: basal stem of spermatheca (sb) (Fig. 78) somewhat similar to M-shaped. . . . . .*A.* (*T.*) *trisulcata*

Bionomics and Distribution

Emplenota. Most specimens used in the present study were collected in the supratidal zones of sandy seashores, which are also inhabited by many staphylinid species. Most Japanese representatives of *Emplenota*, except *A. yamato*, were normally found by seashore lines on sandy coasts composed of fine or coarse sand and small amounts of cobblestones and pebbles. These environments contain only small amounts of mud and matrix, making them somewhat different from intertidal zones, which are preferred by most intertidal staphylinid beetles including species of the genera *Bryothinusa* Casey, 1904, *Diaulota* Casey, 1904 (both Aleocharinae), and *Thinobius* Kiesenwetter, 1844 (Oxytelinae). Our surveys of littoral *Aleochara* species resulted in the collection of abundant material from seaweed, and occasionally from carrion or under flotsam, some of which can be infested by fly larvae as hosts of the rove beetles. The first author collected hundreds of specimens in many areas and confirmed that *Emplenota* species inhabit areas close to shorelines. These areas are usually moderately moist. However, they are not covered by seawater through wave action. At Koura-kaigan (Figs. 93–94), in Shimane-ken, the first author found three sympatric species, namely *A. fucicola*, *A. segregata*, and *A. hayamai* in one mass of seaweed.

Another habitat, the so-called shingle beach composed of shore reef, rocks, and cobblestones, is also suitable to the beetles, and *A. yamato* was found only in that habitat. Other remainig *Emplenota* species, too, prefer shingle beaches. In addition, *A. puetzi* was found in more heterogeneous environments, such as salt marshes, according to

both the original description and the survey conducted by the first author (who surveyed the salt marsh, Mochirippu-numa, Hokkaidô, which was encircled by forest about 400 m from the coast: Fig. 95).



FIGURES 86–92. Terminalia of *Aleochara* (*Triochara*) *nubis*. 86. tergite VIII of male; 87. tergite VIII of female; 88. sternite VIII of male; 89. sternite VIII of female; 90. male genitalia: median lobe of aedeagus in lateral view; 91. male genitalia: median lobe of aedeagus in ventral view; 92. female genitalia: spermatheca.

Most materials were obtained by hand picking, but *Emplenota* species were sometimes caught using flight interception traps (FITs) and yellow pan traps (YPTs) set in the supratidal zone on beaches (Hayama, personal communication). These collecting records are indicative of their flight ability and, as a matter of fact, the first author observed flying individuals at some beaches.

The population increases from early spring to the middle of summer (March to July). The first author observed most individuals in the daytime, usually under or inside seaweed on the beach, but also observed *A. puetzi* walking actively on seaweed at night (21:00 pm) in Ochiishi, Hokkaidô. The hot daytime can be harsh for *Emplenota* species, and some individuals were found underground (several centimetres below the surface) in spots covered by seaweed.

The seaweed species inhabited by *Emplenota* species are quite diverse. For example, wracks of eel grass (*Zostera* sp.; Zosteraceae) were mainly inhabited in Ochiishi. A mixture of *Laminaria* spp. (Laminariaceae), *Sargassum* spp. (Sargassaceae), and others were inhabited at Mochirippu-numa (all of the places are in Hokkaidô). *Emplenota* and *Triochara* species prefer the seaweed in wet or decaying conditions, while another littoral species, *A.* (*Coprochara*) *squalithorax* Sharp, 1888, is often found in completely dried seaweed close to coastal vegetation rather than the shoreline.

The first author observed the mating behaviour of *Aleochara fucicola* and *A. segregata*. The mating style was almost the same as in other aleocharine species, i.e., "assault style", such as in *Aleochara* (*Aleochara*) *curtula* (Goeze, 1777) reported by Peschke (1978).

We raised the total number of species of *Emplenota* from eight to eleven in the world and from two to five in Japan, making Japan as the most species-rich region of the subgenus on the earth. The numerous records in this study provide an overview of the distribution of Japanese *Emplenota* (see, Figs. 101–103). *Aleochara fucicola* and *A. segregata* have a wide distribution from northern to southern Japan. *Aleochara fucicola* is considered to be one of the most common species, with records from all of Honshû, Shikoku, and Kyûshû. *Aleochara segregata* is also considered a common species in Japan and is found from southern Hokkaidô, all of Honshû, Shikoku, Kyûshû, and northern Ryûkyû. In contrast, *A. puetzi*, *A. hayamai*, and *A. yamato* are confined to a few areas in Japan. The former species, *A. puetzi*, was described from the Far East (Russia) and is confined to Hokkaidô in Japan. Records were found throughout Hokkaidô, but no specimens were found beyond south of Hokkaidô. Therefore, this species seems to prefer colder regions, such as the subarctic and cool temperate zone to which Hokkaidô belongs. In contrast, *A. hayamai* was collected mainly from western Honshû and Kyûshû in the Sea of Japan. However, two individuals were found at one locality in Kanagawa-ken, central Honshû, suggesting that other specimens will be found at further localities on the Pacific coast. We presume that the species may be confined to well-preserved environments. The rarest species, *A. yamato*, was discovered from only a single site in Shimane-ken, with a small number of specimens. *Aleochara yamato* may prefer special habitats, environments, or seasons. The type locality is a well-preserved beach, directly adjacent to a forest (Fig. 97).

Triochara. The present study revealed that all of the three known species of the subgenus are halophilous and prefer almost the same environments as *Emplenota* species. Almost all of the specimens of the subgenus collected were confined to the supratidal zone. For example, in the research conducted by the first author in Shikano-shima, Fukuoka-ken, Kyûshû, all of the specimens of *Aleochara* (*Triochara*) *trisulcata* were collected at beaches composed mainly of fine sand. At Hamamatsu (Figs. 98–99), Hokkaidô, all specimens of *A.* (*T.*) *nubis* were also from such beaches. Apparently, *Triochara* species are particular about their habitats compared to *Emplenota* species. *Triochara* species inhabit a limited range of microhabitats, particularly sandy beaches (never discovered from shingle beaches), sands with moderate amounts of moisture, and places somewhat distant from a shoreline and where waves are sometimes blocked by rocks (e.g., Fig. 98). Individuals are hidden inside or under seaweed masses during the day. They move slowly compared to *Emplenota* and some individuals show death mimicry when disturbed. The seaweed used by the species are quite diverse, as in *Emplenota*.

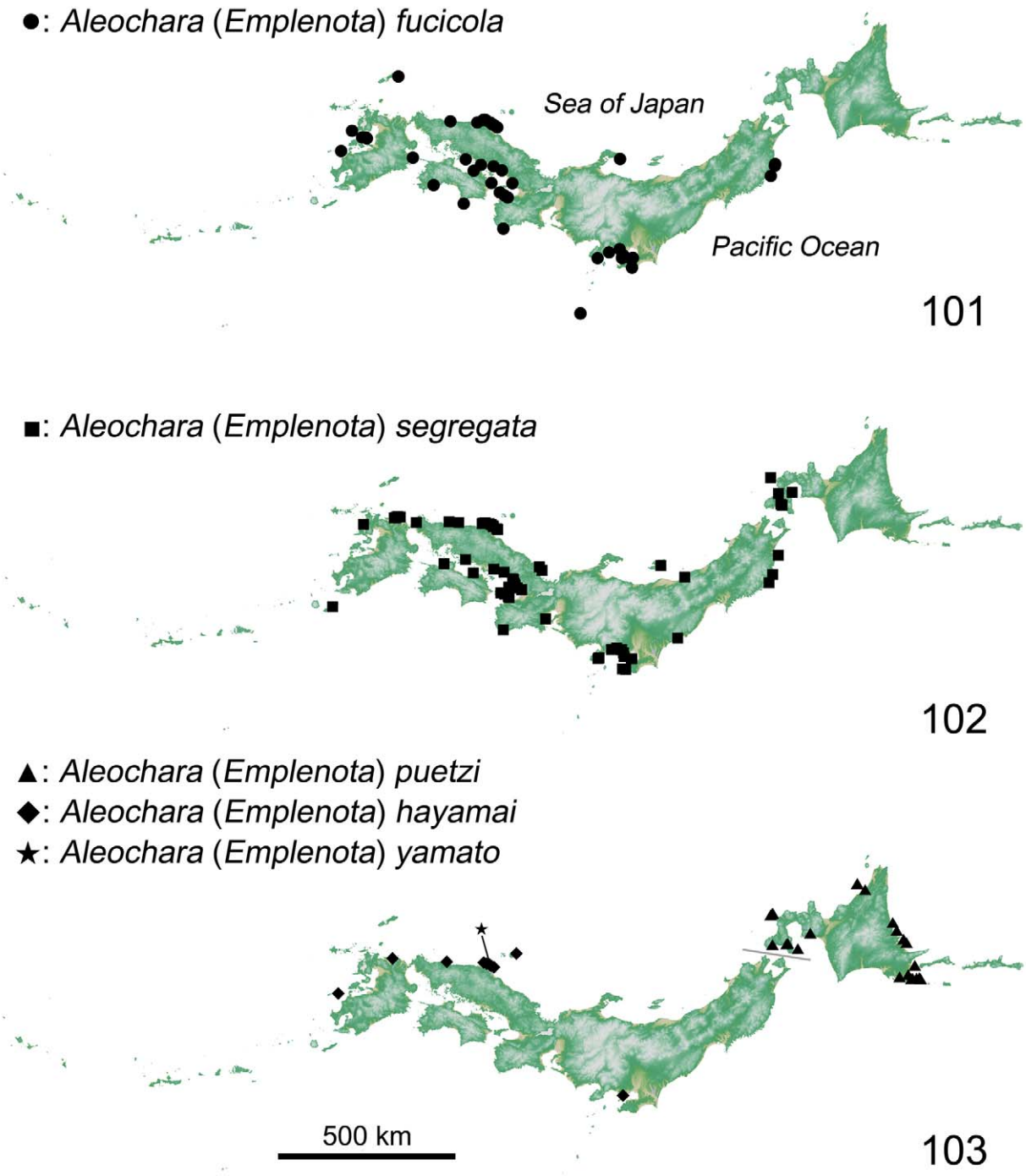
Large numbers of specimens were obtained using the same methods as for *Emplenota* by the authors and colleagues, usually by hand picking. In some cases, trapping was effective as with *Emplenota* species. In fact, using FITs and YPTs set in the supratidal zone of beaches, dozens of specimens were captured. These facts, and observations by the first author, suggest that *Triochara* species are capable of flight.

Large numbers of adults were observed from early spring to the middle of summer (March to August). The seasonal appearance of *A. nubis* lags behind other species by a few months, possibly due to the cold climate of its distributional area.

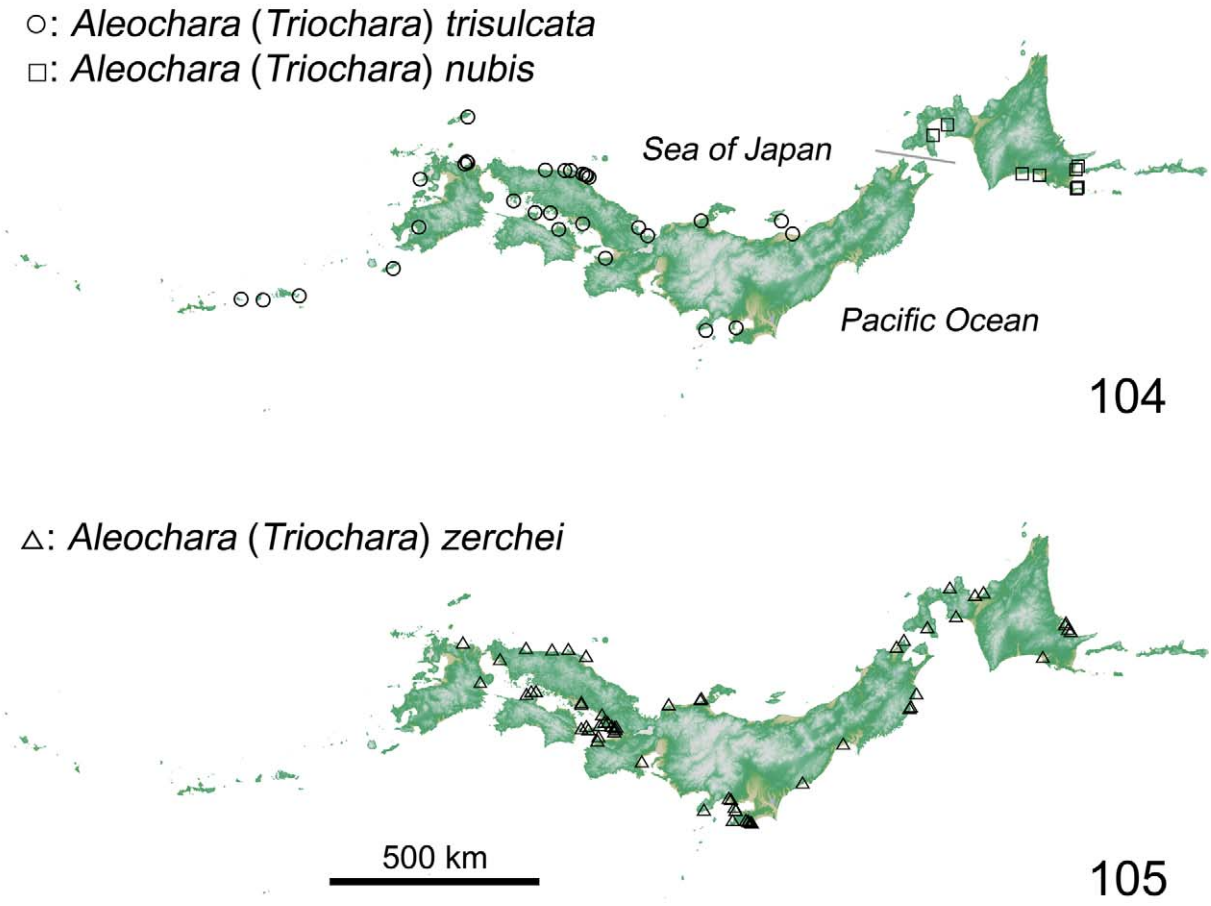
FIGURES 93–100. Collecting sites of the subgenera *Emplenota* and *Triochara* of the genus *Aleochara* in Japan. 93. Koura-kaigan (Matsue-shi, Shimane-ken; habitat of *A.* (*E.*) *fucicola*, *A.* (*E.*) *segregata*, and *A.* (*E.*) *hayamai*; arrow); 94. drifted seaweed and flotsams on beach (Koura-kaigan); 95. Mochirippu-numa (Hamanaka-chô, Hokkaidô; *A.* (*E.*) *puetzi*, arrow); 96. Ochiishi-misaki (Nemuro-shi, Hokkaidô; *A. puetzi*); 97. Kakanokuketo (Shimane-ken; habitat of *A. fucicola*, *A. segregata*, *A. hayamai*, and the type locality of *A.* (*E.*) *yamato*; *A. fucicola*, arrow); 98. Hamamatsu (Nemuro-shi, Hokkaidô; habitat of *A.* (*T.*) *nubis*, arrow); 99. drifted seaweed on beach (Hamamatsu); 100. mating behaviour of *A. nubis* at Hamamatsu.

The first author observed the mating behaviour of *Aleochara nubis* (see, Fig. 100). The mating style was the same as in *Emplenota*.

Our study revealed the distribution of the *Triochara* complex in detail with some interesting findings. The distribution of *Aleochara nubis* is confined to the cool temperate to subarctic zones, and to Pacific Ocean (see, Fig. 104). In contrast, the two remaining species have a more expansive distribution, with *A. trisulcata* having the widest range (Figs. 104–105). As a matter of fact, *A. zerchei* was obtained from the Russian Far East to Kyûshû, southwest Japan, and *A. trisulcata* was found from Hong Kong through Ryûkyû to northeast Honshû (Niigata-ken). In the future, *A. trisulcata* may be discovered from other subtropical regions, whereas *A. zerchei* may be found from northern China or adjacent regions of Japan.



FIGURES 101–103. Collecting localities of *Aleochara* (*Emplenota*) spp. based on specimens examined. 101. *A.* (*E.*) *fucicola* (Pointed by black circle); 102. *A.* (*E.*) *segregata* (Pointed by black square); 103. *A.* (*E.*) *puetzi* (Pointed by black triangle); *A.* (*E.*) *hayamai* (Pointed by black diamond); *A.* (*E.*) *yamato* (Pointed by black star).



FIGURES 104–105. Collecting localities of *Aleochara* (*Triochara*) spp. based on specimens examined. 104. *A.* (*T.*) *trisulcata* (Pointed by white circle); *A.* (*T.*) *nubis* (Pointed by white square); 105. *A.* (*T.*) *zerchei* (Pointed by white triangular).

Coastal habitats of *Emplenota* and *Triochara*

As beaches are situated in ecotone between terrestrial and marine environments, they are important not only for marine species but also for terrestrial organisms. The continuous changes of beaches due to tidal waves and unstable organic materials on the beach may greatly affect the fauna in various ways (Colombini *et al*., 1996; Colombini *et al*., 2000; Colombini & Chelazzi, 2003). The tidal phases influence the zonation of the surface activity and the intensity of movement of some arthropod species, as shown in Colombini *et al*. (1996). The macrofaunal community of beach-cast wrack is generally diverse because of its location, the beach morphology, season, climate, and vegetation (Colombini & Chelazzi, 2003). Stormy weather, high tidal waves on beaches, and other factors such as currents that bring seaweed masses and other flotsam to flat-sandy beaches help to form the wrack belt. After a seaweed mass reaches a beach from an offshore bed, the condition of the wrack mound on the beach changes continuously by dehydration, aging, sand covering, fragmentation, and decomposition (Colombini & Chelazzi, 2003). The subgenera seem to prefer wrack in moist conditions, at least in the core area, rather than dry, hardened wracks.

The major invertebrate groups inhabiting drifted seaweed can be subdivided into early, mid, and late types based on the time of their appearance (Lavoie, 1985). The subgenera of coastal *Aleochara* predate upon dipteran species and their larvae use cyclorrhapheous fly puparia as hosts. Therefore, the members fall into the mid to late category.

Our research indicates that the two subgenera live in the supratidal zone, and prefer to be comparatively close to the shoreline where the sand is moist but waves do not impact the seaweed mass. We never found them in

seaweed masses close to coastal vegetation. Large stranded driftwood often becomes an important habitat to many beach arthropods (Colombini & Chelazzi, 2003), but only small numbers of individuals were found under driftwood in the present study. Probably because both *Emplenota* and *Triochara* use seaweed masses not only as habitat but also as breeding grounds and thus rearing under driftwood may not be suitable for them. The latter subgenus was never discovered on pebble and gravel beaches in the present study. In contrast, the former subgenus, *Emplenota*, was found on both sandy and shingle beaches.

Our data also demonstrate the taxonomic foundations of littoral *Aleochara* in Japan. Additional studies focusing on their nocturnal habits and the tidal phases, and zonation patterns of their habitat (and seasonal changes thereof) are needed. In addition to these factors, the macrofaunal assemblages associated with wrack patches, with special attention to patch size and age (e.g., Olabarria *et al*., 2007), may also be important.

Yamazaki (2012) reported seasonal changes in seaweed deposition, seaweed fly abundance, and parasitism at the pupal stage along sandy beaches. Yamazaki (2012) also provided the parasitism rate for pupae of seaweed flies by staphylinids (*A. fucicola*, *A. trisulcata*) in central Japan, and showed that the low rate varied greatly among three beaches in Japan.

Further accumulation of information is required to assess the coastal biodiversity of these species and their controlling activities of seaweed pest flies as natural enemies.

The impact of humans and the tsunami on invertebrates including rove beetles

It is now apparent that many marine-related environments are threatened by human activity. In Japan, destruction of the seashore due to construction (e.g., ports, wharves, artificial beaches), pollution, dredging, and other human activities has had a large impact on marine habitats for decades. As a result, natural coastlines rapidly declined. In addition, the use of motocross bikes on beaches can affect some littoral habitats, as can the cleaning of beach-cast organic material, which is important to seashore organisms. To protect invertebrates, it is necessary to consider the abovementioned human activities.

Fortunately, observations of the *Emplenota* and *Triochara* species revealed that manmade debris, such as plastic, is not having a large impact on these species, compared to some vertebrates (e.g., sea turtles, seabirds).

The Japanese fauna of coastal rove beetles is very rich (60 species), second to the USA (79 species), in a recent checklist (Frank & Ahn, 2011; present study), hence a faunal investigation in Japan might be important.

It should also be noted that it is important to study the aftermath of the Great East Japan Earthquake (March 11, 2011), which resulted in a massive tsunami disaster, especially around the Pacific coastal regions of the Tôhoku and Kantô districts. Several specimens collected from localities that were subsequently affected by the tsunami were used in this paper. An assessment of the effects of the tsunami should be conducted similar to the insect-faunal research held in the aftermath of the 2004 Indian Ocean earthquake and tsunami (Sites & Vitheepradit, 2010).

Systematic position of *Emplenota* and *Triochara*

The subfamily Aleocharinae is notorious as a taxonomically difficult group and the phylogenetic relationships remain unclear even at the tribal level. Phylogenetic analysis based on molecular data within the genus *Aleochara* were already attempted by Maus *et al*. (2001). The study resolved the genus as being monophyletic and subdivided *Aleochara* into two monophyletic clades. Maus *et al*. (2001) largely support the idea that the subgenus *Emplenota* is a sister group to the subgenus *Triochara* (*A. trisulcata*). Studies based on morphology by Assing (1995) also affirmed the same result and revealed several shared characters (e.g., presence of tibial spines, short tarsi, resemblance of male aedeagi). We agree with the view based on these molecular and morphological investigations. The presence of a pair of subapico-ventral projections on the median lobe of the aedeagus in males of both subgenera is quite notable as well as other peculiar characteristics noted by Assing (1995).

Klimaszewski (1984) revised all of the Nearctic species of *Aleochara*, and proposed the redefinition of *Emplenota*. Assing (1995) already suggested the morphological differences that distinguish the eastern Palaearctic and Nearctic group, and from the western Palaearctic. However, some of the characters defined by Klimaszewski

(1984) do not match with the Japanese species. For example, the Nearctic species are regarded as having the following characters: mesoventrite not carinate, fourth antennal segment spherical, and spermatheca of female with short and erect duct. However, these characters are not shared by some Japanese species. Also, the morphological characters of the subapico-ventral projections on the median lobe of the aedeagus greatly differ between Japanese species and Nearctic taxa. The former species have straight or gently curved subapico-ventral projections, while the Nearctic ones have clearly angled projections (see, Klimaszewski, 1984: Figs. 193, 195). The first author observed some specimens of the Nearctic species *Aleochara* (*Emplenota*) *littoralis* (Mäklin, 1853) and *Aleochara* (*E.*) *pacifica* (Casey, 1894) and confirmed that these two groups may belong to different lineages. The taxonomic study of seashore aleocharines are rather complicated due to the convergence of many taxonomically important mouthpart characters (Maruyama, 2011) and the *Emplenota* complex is no exception. Therefore, to establish a precise phylogeny, studies focusing on DNA and worldwide research are needed to resolve these problems. In particular, DNA data would help to construct a more precise phylogeny of the subgenera, in particular the relationships amongst the eastern and western Palaearctic, and Nearctic regions.

Observed specimen data of Nearctic species

A. littoralis: 1 ♂, J. H. Emerton/Grafton/Y-15-05 MS. [HW]//Aleochara/(Emplenota)/maritima (Csy.)/det. J. Klimaszewski. [FMNH].
A. pacifica: 1 ♂, Redondo,/Cal./Dr. A. Fenyes//Sept.//634. [HW]//Aleochara/(Emplenota)/pacifica (Csy.)/det. J. Klimaszewski//Chicago NHMus/M. Bernhauer/Collection. [FMNH].
Genital parts of the above specimens were also examined.

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APPENDIX 1. Species list of Japanese names of *Aleochara* (subgenera *Emplenota* and *Triochara*).

Subgenus *Emplenota*	
Scientific name	Japanese name
Aleochara (*Emplenota*) *fucicola* Sharp, 1874	Tsuyakeshi-higebuto-hanekakushi
A. (*E.*) *puetzi* (Assing, 1995)	Kita-tsuyakeshi-higebuto-hanekakushi
A. (*E.*) *segregata* n. sp.	Nise-tsuyakeshi-higebuto-hanekakushi
A. (*E.*) *hayamai* n. sp.	Hayama-tsuyakeshi-higebuto-hanekakushi
A. (*E.*) *yamato* n. sp.	Ô-tsuyakeshi-higebuto-hanekakushi
Subgenus *Triochara*	
Scientific name	Japanese name
Aleochara (*Triochara*) *trisulcata* Weise, 1877	Hoso-sesuji-higebuto-hanekakushi
A. (*T.*) *zerchei* (Assing, 1995)	Nise-sesuji-higebuto-hanekakushi
A. (*T.*) *nubis* (Assing, 1995)	Ezo-sesuji-higebuto-hanekakushi