

## HEBRIDAE IN FORMOSA (Hemiptera)

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<https://doi.org/10.15017/7343645>

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出版情報 : Sieboldia : acta biologica . 3 (3), pp.281-290, 1965-12-30. 九州大学教養部生物学教室  
バージョン :  
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## HEBRIDAE IN FORMOSA (Hemiptera)

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Although one species of the family, *Hebrus bergrothi* Horváth, has been reported from Formosa, the author could study 6 species of 2 genera, but the above-mentioned species, in the Heteropterous material taken by the Japan-U.S. Co-operative Science Program in 1965 and the collection of Entomological Laboratory, Kyushu University. One species of *Hebrus* and 3 of *Timasius* will be described as new in the present article.

The author thanks to Dr. J. Minamikawa (=J. Sonan) of Tokyo, Mr. T. Saigusa of General Education Department, Kyushu University and Mr. H. Hasegawa of the National Institute of Agricultural Sciences, Tokyo, for their kind help in material.

Acknowledgment is made of the partial financial support of this investigation through a grant from the Japan Society for the Promotion of Science as part of the Japan-U.S. Co-operative Science Program.

### ***Hebrus megacephalus* Miyamoto, sp. nov.**

(Pl. 13, fig. a, Textfigs. 1—4)

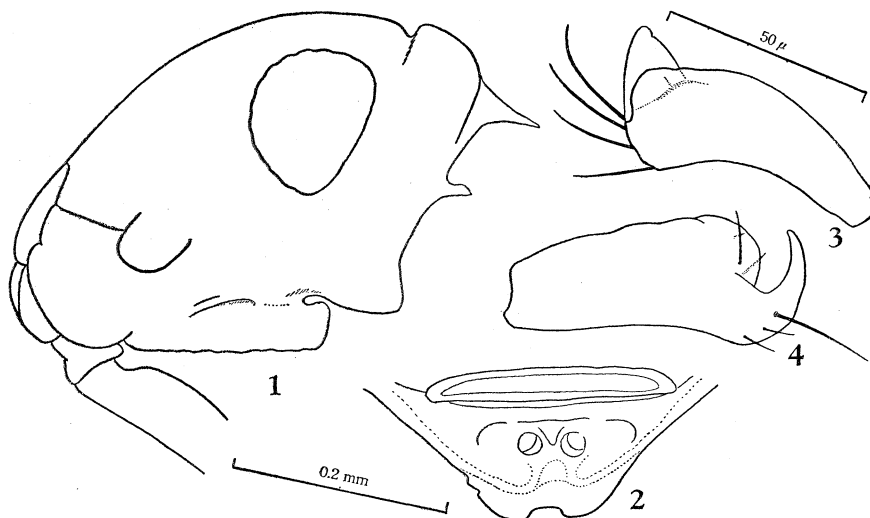
*Size:* For male length of body 1.40 mm. and greatest width across metathorax 0.55 mm.; those for females 1.44—1.50 mm. long and 0.58—0.60 mm. wide.

Pale yellowish brown. Head somewhat brown along median line of vertex, infusate inside of ocelli, with eyes dark brown and with antennae brownish. Hemelytra with apical parts of veins infusate and membrane clouded and without pale spots. Legs pale on femora but darkened toward apex. Dorsal surface of abdomen a little darker than on pronotum.

Body furnished with fine pubescence. Head (Textfig. 1) relatively large, declivous, slightly wider than long (.34 : .29), about two-thirds as much as wide across humeri (.34 : .53), not depressed behind clypeal base; bucculae (Textfig. 1) simple, with lower margin broadly straight, posterior projection broad and the apex gently round; eyes small, shortest distance

between eyes about three-fifths as much as head wide. Antennae somewhat short, 1st segment short, subequal to 2nd, 4th segment with a pseudarticulation at one-third from base; relative lengths of antennal segments: I to IV=.14 : .13 : .21 : .29. Rostrum a little extending over apex of hind coxae.

Pronotum constricted at middle; pronotal width not more than twice as much as median length or anterior collar width, the disc with sparse



Textfigs. 1—4. *Hebrus megacephalus*, ♂. 1 head, lateral view, 2 scutellum, 3 & 4 right- & left-hand parameres respectively.

punctures and without longitudinal furrows connecting punctures; scutellum (Textfig. 2) broad and short, with the apex shallowly notched. Hemelytra short, not reaching hind margin of 5th abdominal tergite, corium pubescent. Relative lengths of leg segments: femur: tibia: tarsus (2 segments put together)=.34 : .36 : .11 in fore legs, .36 : .33 : .11 in middle ones, .44 : .45 : .13 in hind ones.

Right-hand paramere (Text-fig. 3) with a thin triangular lobe at dorsal apex and furnished with 4 long bristles along abical margin; left-hand one (Textfig. 4) with an upwardly curved claw-like projection at apex and furnished with a long bristle and a few shorter ones near apex.

Holotype ♂, mounted on the slide, allotype ♀ and 3 ♀♀, all brachypterous, Sōzan (Yan-min-shan near Taipei), N. Formosa, 12. vii. 1940, S. Miyamoto, in moss on the inside wall near a spouting part of hot

All measurements are in mm. and appendages were measured in dried specimens.

spring. Holotype, allotype and some paratypes are kept in the collection of Entomological Laboratory, Kyushu University.

This species may be closely allied to *H. bergrothi* Horváth but distinguished from it in much paler colour, particularly on hemelytra, venter and on basal parts of corial veins, and concaved apex of scutellum.

### ***Hebrus nipponicus* Horváth, 1929**

*Hebrus nipponicus*: Esaki, 1932, Icon. Ins. Jap.: 1638, f. 3235.

*Hebrus nipponicus*: Lundblad, 1933, Arch. Hydrobiol. Suppl. 12: 269—272, textfigs. 75, 76, 77B & C & 78B.

*Hebrus nipponicus*: Miyamoto et Lee, 1963, Kontyû 31: 33—34 (Korea).

Specimens examined: 1 ♀, Hokuto (Peito) near Taihoku, N. Formosa, 9. ii. 1940, S. Miyamoto; 1 ♀, Taihoku, 30. vii. 1940, S. Miyamoto.

Distribution: Sumatra, Java, Formosa (new record), Korea and Japan (Honshu—type loc., Kyushu & Shikoku).

### ***Hebrus hasegawai* Miyamoto, 1964**

(Pl. 13, fig. b; Textfigs. 5—13)

*Hebrus hasegawai* Miyamoto, 1964, Sieboldia 3 (2): 198—199, pl. 10.

As the previous description depended on females from Iriomote I. of the Ryukyus, a supplementary description is given below.

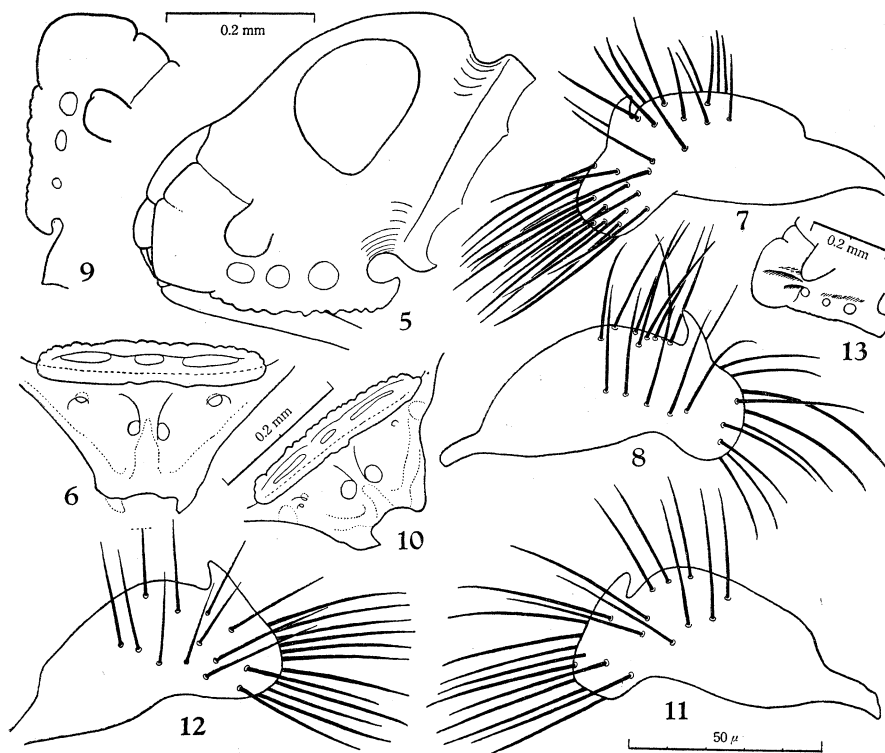
For males body length 1.90—1.95 mm. and greatest width, across humeri, 0.11 mm. Colour on pronotum varied from dark brown to yellowish brown. Bucculae (Textfigs. 5, 9 & 13) with lower margin minutely irregularly waved, hind apex truncate in the type (Textfig. 13) and some of the Formosan material or obliquely truncate (Textfigs. 5 & 9). Hemelytra of male reaching tip of abdomen. Relative lengths of leg segments (♂) from femur to tarsus (2 segments combined) = .49 : .47 : .13 in fore legs, .51 : .48 : .17 in middle ones and .65 : .69 : .20 in hind ones.

Parameres (Textfigs. 7, 8, 11 & 12) of similar shape, furnished with the apex produced roundly and postero-ventrally, and armed with a hook-like subapical projection on dorsal side.

Specimens examined: 2 ♂♂, 4 ♀♀, 1 nymph, Chu-chi (Takesaki), C. Formosa, 15. iv. 1965, S. Miyamoto; 2 ♀♀, Kuan-tzu-ling (Kanshirei), C. Formosa, 6. iv. 1965, S. Miyamoto; 1 ♂, Taihoku (Taipei), N. Formosa, 21. iv. 1940, S. Miyamoto; 1 ♀, Shinten near Taihoku, 7. x. 1933, R. Takahashi; 1 ♀, Sōzan (Yan-min-shan) near Taihoku, 12. vii. 1940, S. Miyamoto, in moss near a spouting part of hot spring; 2 ♂♂, 2 ♀♀, Chipon, E. Formosa, 18. vii. 1941, H. Hasegawa.

On the basis of the structure of scutellum and parameres this species is related to *H. cruciatus* (Distant) of Philippines but distinguished from

it by the smaller body, 3 narrower pale markings on membrane, relatively shorter tarsus to tibia in hind legs and ventrally curved apex of parameres.



Textfigs. 5—13. *Hebrus hasegawai*. 5—8 ♂ from Chu-chi, C. Formosa, 9—12 ♂ from Chipon, E. Formosa, 13 ♀ type from the Ryukyus; 5 head, lateral view, 9 & 13, lower halves of heads, lateral view, 6 & 10 scutellum, 7 & 11 right-hand parameres, 8 & 12 left-hand parameres.

### **Timasius** Distant

*Timasius* Distant, 1906, Ann. Mag. Nat. Hist. (8) 3: 498—499; the type of genus: *T. splendens* Distant, 1909, 1. c.: 499.

*Timasiellus* Lundblad, 1933, Arch. Hydrobiol. Suppl. 12: 283—285; the type of genus: *T. chinai* Lundblad, 1933, 1. c. (*syn. nov.*)

There are 3 species of the genus *Timasius* from Formosa; 2 out of them have head and pronotal longitudinal carinae distinguishable, though they are not very sharp, while the remaining one has no carinae on head. Dr. Lundblad established *Timasiellus* based upon a new species from Java and separated it from *Timasius* Distant by the absence of paired

longitudinal carinae both on head and pronotum and the shape of bucculae. But these characters seem to be infrageneric.

The following characters may be added to the generic diagnosis. Hemelytra with 3 corial veins and 2 closed-cells; abdominal segments, flattened dorso-ventrally, particularly so in genital ones; parameres distinctly asymmetrical. Head and pronotum with paired longitudinal carinae in *Timasius* and without in *Timasiellus*.

Hemelytral venation of *Timasius* is most related to that of *Perittopus* (Perittopinae, Veliidae), and more over, vestigial veins on membrane show a transition to the most usual feature of venation of the Veliidae.

***Timasius distant*** Miyamoto, sp. nov.

(Pl. 14, fig. a; Textfigs. 14–19)

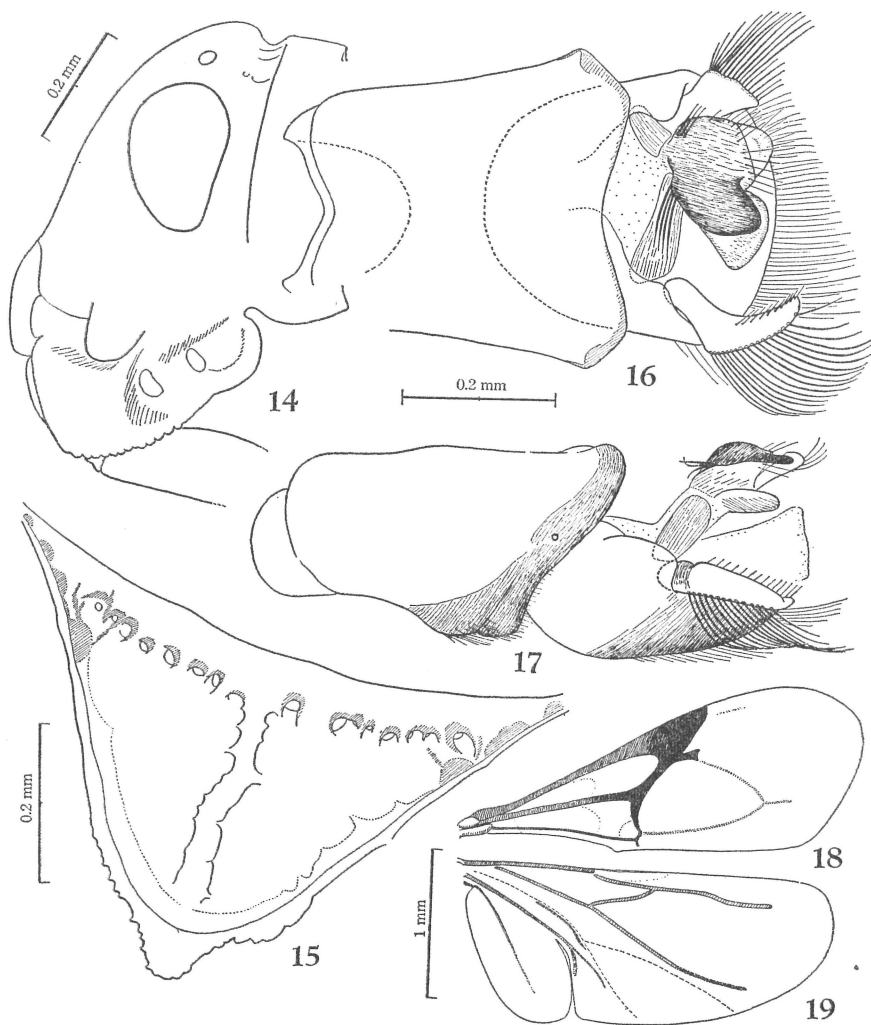
*Size*: For males length of body 3.40–3.73 mm. and width between humeri 1.35–1.51 mm.; those for females 3.5–3.6 mm. long and 1.35–1.4 mm. wide.

*Coloration*: Black, with scattered golden hairs on dorsum. Antennae dark brown, bucculae broadly pale, rostrum pale brown. Hemelytra dark, with an elongate grayish blue marking on each corial cell, that on posterior cell much larger, and with darker veins and piceous black apical parts of cells; membrane blackish on apical half, with 2 black markings, the one representing short membrane vein and the other before centre, and with 2 bluish markings, the one behind centre and another near posterior corner. Legs pale brown on 3 basal segments, dark or blackish brown on tibiae and tarsi; femora darkened at apex, with scattered dark spots. Thoracic venter covered with grayish hairs, abdominal venter with pale brown hairs.

*Structure*: Body somewhat elongate, moderately flattened dorso-ventrally. Head (Textfig. 14) declivous, produced in front, depressed behind clypeal base; eyes prominent, wider than half as long as interocular distance (.165 : .27); ocelli distinct; 2 longitudinal carinae on vertex obsolete on anterior part, a pit at base of sulcus between carinae; bucculae (Textfig. 14) tall, slightly concaved behind middle, broadly round on hind end. Antennae a little longer than half the length of body, 1st segment the thickest, equal to 3rd in length, narrowed near base, 2nd somewhat widened toward apex, 4th with a pseudarticulation somewhat behind middle; relative lengths of the segments: I : II : III : IV = .48 : .36 : .48 : .69. Rostrum long, reaching apex of mesocoxae.

Pronotum more than twice as wide as head with eyes (1.51 : .60), nearly three times of anterior collar width (1.51 : .57), about twice of the median length (1.51 : .74), constricted before middle, humeral angles produced, the disc distinctly punctured, with a paired median carinae which are obscure on posterior parts; scutellum (Textfig. 15) triangular,

broader at base than long, with distinct median and lateral carinae, with lateral sides suddenly narrowed near apex. Hemelytra (Textfig. 18) very little surpassing over tip of abdomen, corium with a longitudinal vein (Cu) near hind margin and 2 closed-cells; membrane broad, with short longitudinal membrane vein (R+M) and with trace of elongations of M and Cu-veins and a membrane cell enclosed by them; hind wings (Textfig. 19) bilobed, with 4 longitudinal and one accessory veins and one closed-cell. Legs with hind femora slenderer than in anterior two pairs



Textfigs. 14—19. *Timasius distanti*, ♂. 14 head, lateral view, 15 scutellum, 16 & 17 genital segments with anal conus, dorsal & lateral views respectively, 18 & 19 hemelytron & hind wing respectively.

and slightly sinuate, tibiae straight; relative lengths of leg segments: femur: tibia: tarsus (2 segments put together) = .87 : .88 : .28 in anterior legs, .98 : 1.00 : .33 in middle ones and 1.20 : 1.56 : .37 in posterior pair.

Genital segments (Textfigs. 16 & 17) dorso-ventrally flattened. Male 9th abdominal segment somewhat asymmetrical, furnished with long hairs on ventral hind portion, longer on left side. Parameres (Textfigs. 16 & 17) asymmetrical; right-hand one stump-like; left-hand one long, curved, widened at middle of outer side, with 2 rows of bristles along outer and dorsal margins respectively, bristles of outer margin very long. Anal conus\* distinctly asymmetrical, with dorsal and ventral lateral lobes on the left side.

Holotype ♂, allotype ♀ and 4 paratypes, Fen-chi-hu (Funkiko), ca. 1400 m. in height, 13. iv. 1965, S. Miyamoto, on rocks near water of rapid stream; 1 ♀, the same place, 12. iv. 1965, T. Saigusa; 1 ♂, 1 ♀, Ko-tzu-lin (Kashirin), 1,400 m. in height, 14. iv. 1965, T. Saigusa; 3 ♀♀, Chi-hsin-liao (Keishinryō), ca. 800 m. in height, near Chu-chi (Takesaki), 15. iv. 1965, T. Saigusa; all these habitats are in the western lower mountain region of Alishan, C. Formosa. The type is preserved in the collection of Entomological Laboratory, Kyushu University. This insect inhabits on wet rocks in shaded parts and in disturbance it can fly short distance and rapidly slide water surface by fluttering.

The present species is easily separated from the recorded species in the distinctly larger size, from *T. splendens* Distant by the absence of semicircular incision near posterior end of bucculae.

### **Timasius minamikawai Miyamoto, sp. nov.**

(Textfigs. 20 & 21)

*Size:* For male body length 3.07 mm. and width across humeri 1.31 mm.; those for female 3.10 mm. long and 1.30 mm. wide.

Coloration alike to that of the preceding species but antennae and legs slightly paler, pale markings on hemelytra wider and bluish gray, base of vertex brownish and femora devoid of dark spots.

Eyes nearly two-thirds as wide as interocular distance (.155 : .24); 2 longitudinal carinae on head obscure, no median pit on base of vertex; bucculae (Textfig. 20) with lower margin broadly round and posterior end produced below, forming a small lobe. Antennae distinctly more than half as long as body; relative lengths of the segments from I to IV = .44 : .36 : .45 : .67; 4th segment with a pseudarticulation a little behind middle. Rostrum just reaching apex of middle coxae.

Pronotum not more than twice as wide as long (1.31 : .66),

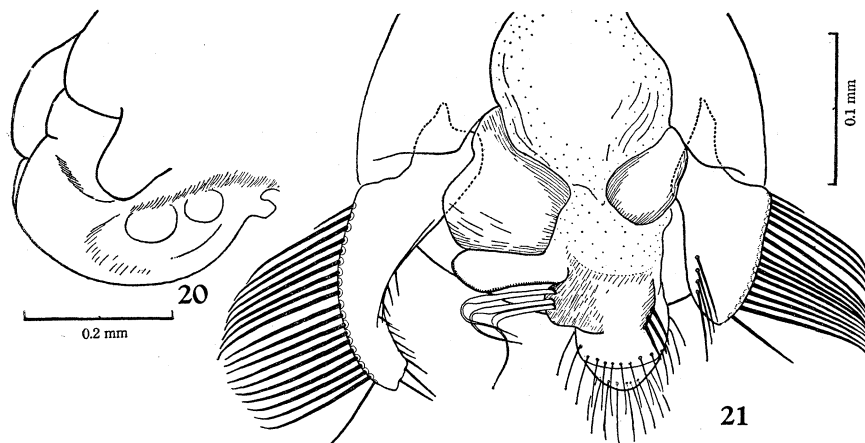
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\* This may represent 10th abdominal segment and a pair of lateral sclerites, lying between base of anal conus and middle of side walls of genital capsule, may represent 9th tergite.

pronotal carinae less distinct than in the preceding species. Relative lengths of the leg segments from femur to tarsus (2 tarsal segments combined), .72 : .75 : .29 in fore legs, .87 : .98 : .29 in middle ones and 1.06 : 1.31 : .36 in hind ones.

Male abdominal venter along median line with a distinct oval depression which occupies from 3rd to 7th ventrites and the border furnished with dense brown hairs. Right-hand paramere (Textfig. 21) distinctly narrowed near base; left-hand one (Textfig. 21) gently curved, dilated before middle and tapering toward apex. Anal conus on the left side with a dorsal semicircular lobe, which is furnished with 3 peculiar bristles, and with a ventral spatulate lobe.

Holotype ♂ and allotype ♀, Sekitei, N. Formosa, 6. viii. 1924, J. Sonan; these are preserved in the collection of Entomological Laboratory, Kyushu University.



Textfigs. 20 & 21. *Timasius minamikawai*, ♂. 20 lower half of head, lateral view, 21 9th abdominal segment, excepting base, and anal conus, dorsal view.

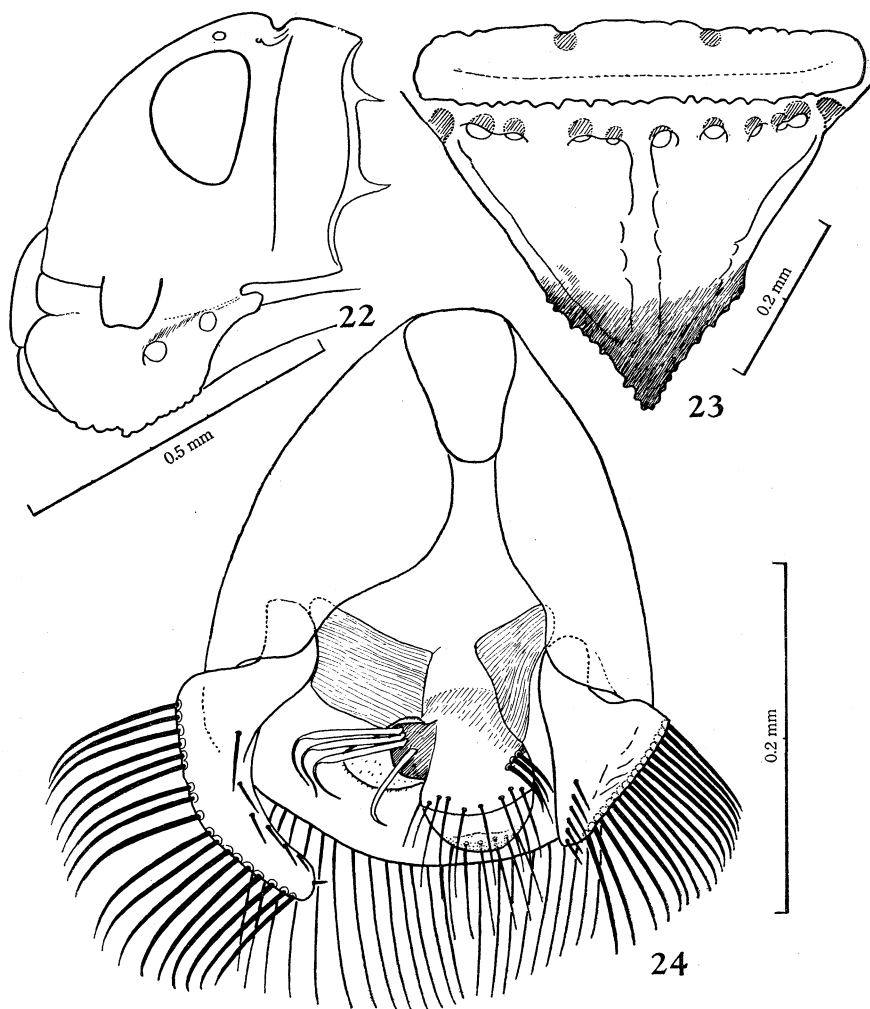
*Minamikawai* is easily distinguish from *distanti* by the smaller body, an oval depression on abdominal venter, shape of bucculae, structure of parameres and anal conus, etc. From *splendens* this is different in obscure paired longitudinal carinae both on head and pronotum and no semicircular excavation near hind end of bucculae. The specific name is dedicated to Dr. J. Minamikawa, whose old name was J. Sonan and he had worked on the insects in Formosa for many years.

***Timasius* (*Timasiellus*) *lundbladi* Miyamoto, sp. nov.**

(Pl. 14, fig. b; Textfigs. 22–24)

*Size and measurements:* For males length of body 2.7–2.92 mm. and

width across humeri 1.1–1.2 mm.; those for females 2.75–3.05 mm. long and 1.15–1.22 mm. wide. Measurements of a male—Body length 2.90 mm.; head width including eyes 0.51 mm., synthripsis 0.24 mm., median length of pronotum 0.58 mm., width across humeri 1.16 mm., scutellum 0.33 mm. long and 0.52 mm. wide; relative lengths of antennal segments: I to IV = .36 : .27 : .36 : .67; those of leg segments: femur: tibia: tarsus (2 segments combined) = .58 : .60 : .23 in fore legs, .72 : .70 : .25 in middle legs and .95 : 1.09 : .31 in hind legs.



Textfigs. 22–24. *Timasius lundbladi*, ♂. 22 head, lateral view, 23 scutellum, 24 9th abdominal segment with anal conus, dorsal view.

Coloration and structure very similar to those of *T. minamikawai* but different from it as follows: Legs from coxae to femora paler. Vertex slightly depressed in middle near base but without longitudinal elevations; bucculae (Textfig. 22) concavely sinuate behind middle and with posterior end lobed and directed behind; rostrum reaching a little beyond apex of middle coxae. Pronotum twice as wide as long, paired longitudinal carinae on the disc feeble and confined to anterior lobe or between calli. Abdominal venter of male along median line somewhat flat but not depressed.

Paramers (Textfig. 24) somewhat similar to those of *minamikawai* but narrower at base and the left-hand one a little more strongly curved. Dorsal semicircular lobe on anal conus (Textfig. 24) furnished with 4 basally flattened bristles.

Holotype ♂, allotype ♀ and paratypes 7 ♂♂, 8 ♀♀, 3 nymphs, Kuan-tzu-ling (Kanshirei), 250 m. in height, C. Formosa, 6. iv. 1965, S. Miyamoto; on rocks in mountain stream in shaded parts; 1 ♂, the same locality, 6. iv. 1965, S. Miyamoto, at light; holotype, allotype and some paratypes are kept in the collection of Entomological Laboratory, Kyushu University. Habitat and behaviour are quite similar as in *T. distanti*.

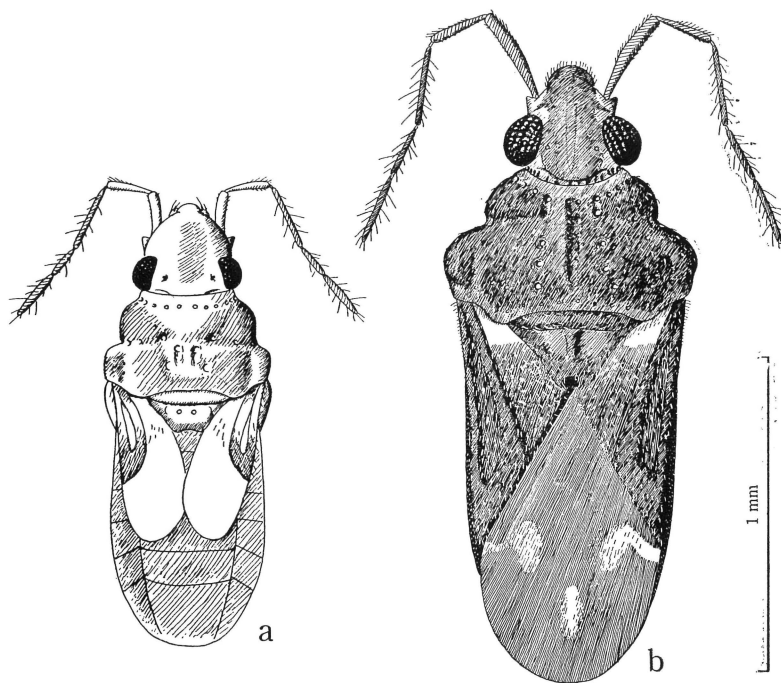
This is different from *T. chinai* of Java in black body and well-defined bluish gray markings on corium.

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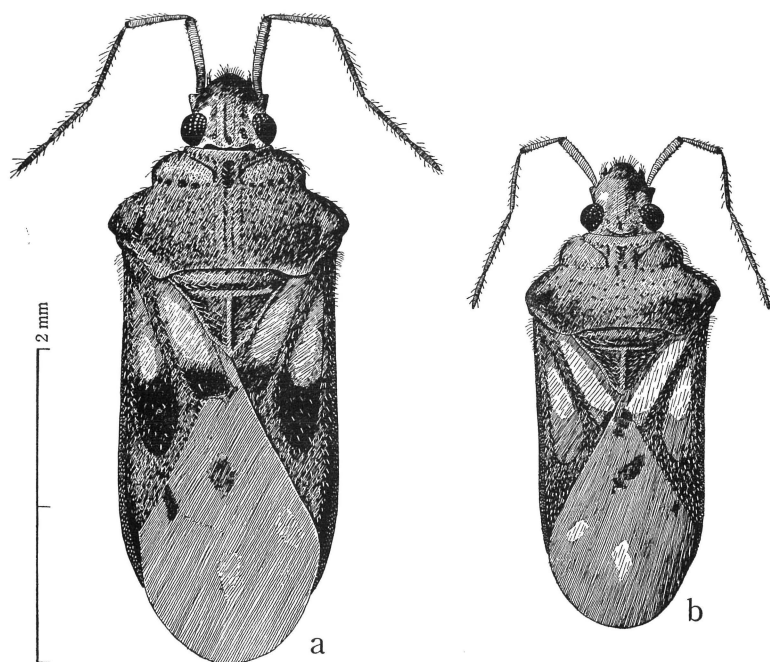
### Explanation of plates 13 & 14

- Plate 13. a *Hebrus megacephalus* Miyamoto, ♂.  
 b *H. hasegawai* Miyamoto, ♂ from Chu-chi.  
 Plate 14. a *Timasius distanti* Miyamoto, ♂ from Kuantzuling.  
 b *Timasius lundbladi* Miyamoto, ♂ from Fen-chi-hu.



Hebridæ in Formosa





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