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TAIWANESE ODONATA TAKEN BY MR. Y. I. CHU

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Through the courtesies of Mr. Y. I. Chu, Lecturer in entomology, in the National Taiwan University, Taipei, I had an opportunity to examine a series of Odonate specimens. These are collected by Mr. Chu and are composed of nineteen species, but contain extremely interesting examples, one new species of *Merogomphus*, one undescribed female of *Anisogomphus*, a new *Macromia* and an undescribed male sex of *Macromia clio* Ris. *Merogomphus* is a Tonkinese and continental Chinese genus, this is therefore a new addition to Taiwanese fauna.

For these wonderful materials I have to express my cordial thanks to Mr. Chu for his endeavours and kindness. In this occasion I added a description of a new *Stylogomphus* collected by Mr. Chang who kindly forwarded it to me through the hand of Prof. T. Shirôzu.

CALOPTERYGIDAE

1. *Mnais tenuis* Oguma タイワンカワトンボ
1 ♀ Yangming-shan, 9. IV. 1966

GOMPHIDAE

2. *Leptogomphus sauteri formosanus* Oguma ホソサナエ
1 ♂ 1 ♀ Pinglin, Taipei Prov., 23. VI. 1965
3. *Anisogomphus koxingai* Chao タイワンミヤマサナエ (新称)
Anisogomphus koxingai Chao, Acta Ent. Sinica, 4 (3), 217-218, 1954
“♂ (teneral) Shinten, Taipei Prov., 17. V. 1940; 1 ♂ Paratype, Taiwan (Maa)”
1 ♀ Suan chi kou, Taipei Prov., 24. V. 1966.

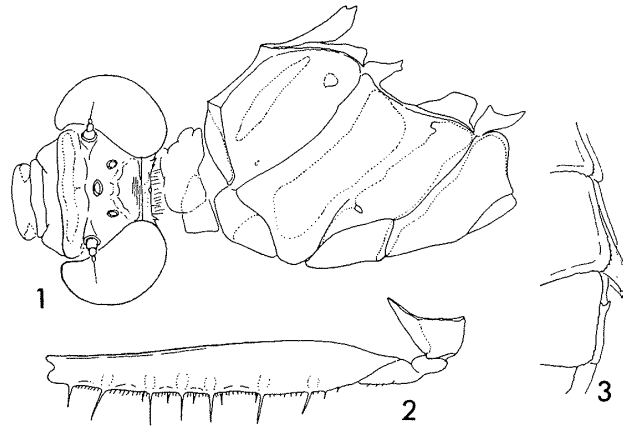
Of the dragonflies of the genus *Anisogomphus* Chao first described this species from Taiwan based on two male specimens. I believe the present female specimen can be identified as the same with it.

♀ Allotype: Teneral insect, abdomen 40 mm, hindwing 31 mm.

Head black, only two lateral spots on labrum, and a narrow transverse frontal marking yellow; occiput with minute lateral spines on the posterior margin which is fringed with long hairs (Fig. 1).

Thoracic markings are as shown in Fig. 1, the yellow collar, an isolated frontal stripe, an upper antehumeral spot, three broad yellow bands on the side may be characteristic. Legs black except the coxae, hind femora armed with strong spines (Fig. 2).

Abdomen 1-3 with narrow middorsal longitudinal stripe, lateral side mainly



Figs. 1-3. *Anisogomphus koxingai* Chao, ♀. タイワンミヤマサナエ.

- 1: Head and thorax.
 2: Right femur, external.
 3: Valvula vulvae, right side.

yellow; 4-6 black, each with a basal narrow yellowish ring, 7 the ring broader occupying basal 1/4, 8-10 black, cerci black. In this specimen the valvula vulvae is strongly deformed laterally (Fig. 3).

4. *Merogomphus chui* sp. nov.

1 ♂ Pinglin, Taipei Prov., 24. VI. 1965

A rather large-sized Gomphid, characterized by the structure of caudal appendages (Fig. 4).

♂ (Holotype) mature insect, abdomen+appendage 50+2 mm, hindwing 39 mm.

Head lustrous black, the following portions are yellow: labrum excepting the anterior and posterior margins, anteclypeus except the anterior and posterior part, two lateral spots of postclypeus, a broad transverse band on the antefrons, mandible save the apical part, basimandibular sclerite; the frons is very broad so that the eyes are situated markedly laterad. The posterior border of the occiput thinly extended backward and fringed with black hairs, there are 3-4 minute teeth on each side of the border.

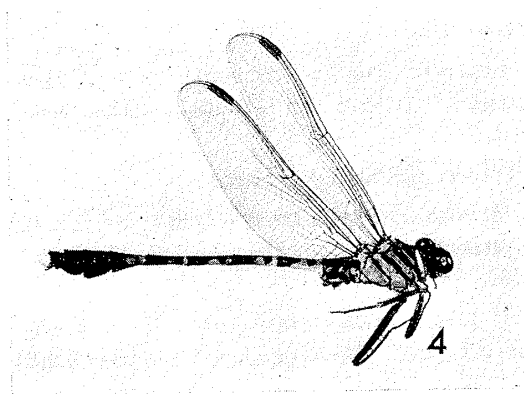


Fig. 4. *Merogomphus chui* sp. nov., ♂.
 Holotype.

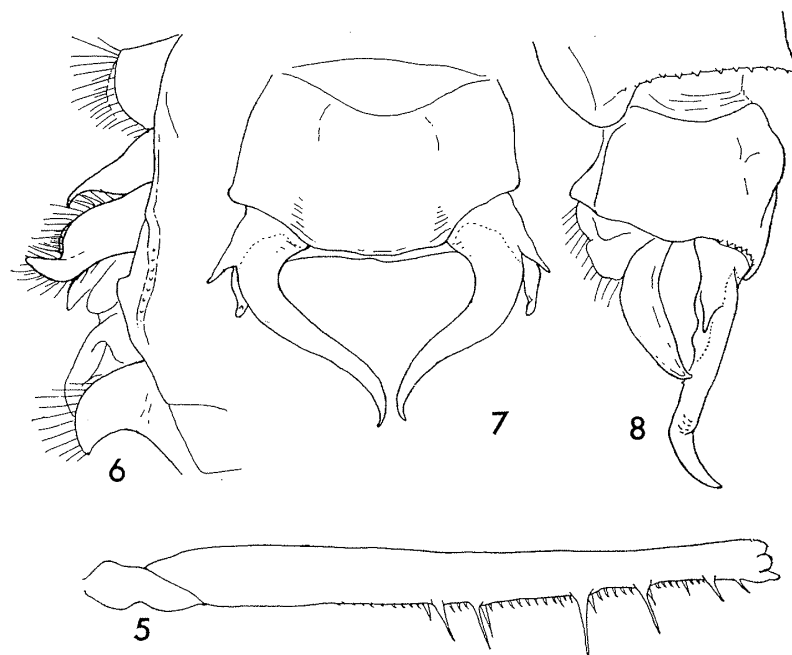
Prothorax with three spots on the posterior lobe of tergite. Pterothorax deep black anteriorly, there is an isolated narrow anterior yellow stripe and a complete yellow antehumeral stripe. Lateral sides yellow with complete first

and second lateral black stripes.

Wings hyaline, rather broad, neuration rather dense with large black pterostigma which measures 4.5 mm, covering 5-6 cell-length; nodal index $\frac{14:16}{14:10} \mid \frac{16:15}{12:14}$, all the triangles free, there is no basal subcostal cross vein.

Legs black, only coxae striped with yellow, the hind femora are long and robust, the distal end reaching the end of 2nd abdominal segment, the internal side armed with two rows of strong spines (Fig. 5).

Abdomen 1 and 2 each with a dorsal yellow spot and usual irregular lateral yellow markings, auricles black; spotted yellow dorsally; segment 3 and 4 mainly yellow spotted black subbasally and in distal half; 5 and 6 more black leaving basal yellow ring; 7 basal half yellow, distally black and abruptly widened, 8 and 9 black and foliated laterally; 10 very flat, black. Accessory genitalia of 2-3 segments as Fig. 6, entirely black.



Figs. 5-8. *Merogomphus chui* sp. nov., ♂.
5: Left femur, external. 6: Accessory genitalia, left side.
7-8: Caudal appendages.

Caudal appendages conspicuous, the superiors yellowish, strongly incurved with subbasal external spine which is dark tinted; the inferior broadly divaricate (Figs. 7, 8).

Remarks: The genus *Merogomphus* was established by Martin (1904, p. 214) based on *M. paviei* Martin, ♂♀ taken in Tonkon. It is almost same size and

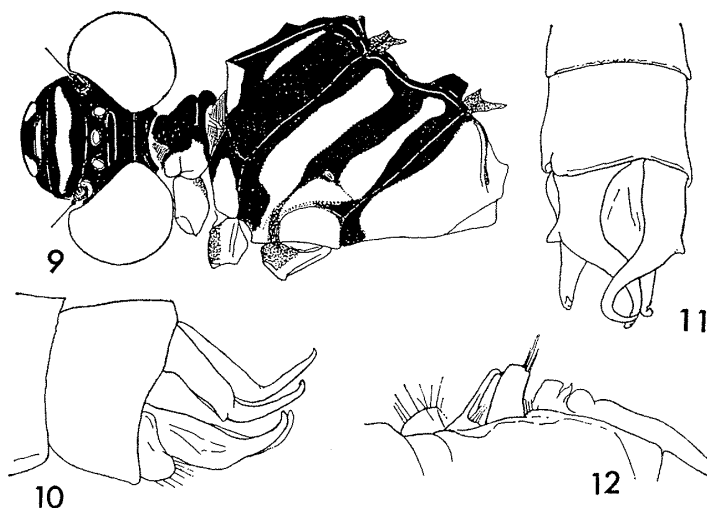
seems to be closely allied with ours but differs in some details. Other two species, *M. parvus* Krüger, 1899, first described as *Leptogomphus parvus* from Sumatra, and *M. femoralis* Laidlaw, 1931, from Malaya, are small insects. In 1930 Neeham described *M. vandykei* from Central China (Kiangsu and Chekiang) and subsequently Navas (1932) described "*Anisogomphus pieli*" which is correctly a *Merogomphus* and later synonymized by Chao (1962) with Tonkinese *M. paviei*, but not with *vandykei*!

The present author (1961) illustrated a female of *M. vandykei* taken from Chekiang and stated that *pieli* is the same with *vandykei*.

The present new species is most closely related to *vandykei*, and though there is a possibility that the former is a geographical race of continental *vandykei* the following differences led me decide to describe it as separate species for the moment.

1. The superior caudal appendage has a lateral subbasal sharp spine (Figs. 7, 8).
2. In the male accessory genitalia the hamulus posterioris has a terminal process standing upward and not curved anteriorly as shown by Chao (1962, p. 26), fig. 8, as that of *paviei*=*pieli*). The shape of hamulus anterioris is also somewhat different (Fig. 6).
3. No yellow spot on the tenth segment.
4. The first lateral stripe of pterothorax complete and distinct. (This stripe is liable to degenerate in many continental Chinese Gomphids.)
5. ***Stylogomphus changi* sp. nov.** オオオジロサナエ (新称)

1 ♂ Nan-shan-chi, Nantow Prov., 3. VI. 1965, leg. Chang



Figs. 9-12. *Stylogomphus changi* sp. nov., ♂.

オオオジロサナエ.

9: Head and thorax. 10-11: Caudal appendages.
12: Accessory genitalia, right side.

Holotype ♂, a mature insect.

A rather large species in this genus, abdomen+appendage 22+1.5 mm, hindwing 28 mm. This is undoubtedly very closely allied to *S. chunliuae* Chao of Fukien. The distinguishing characters can be listed as follows:

1. Superior caudal appendage black, rather slender with a distinct lateral angulation (Figs. 10, 11).
2. Inferior caudal appendage very long, divided distally and parallel, only slightly shorter than the superior (Figs. 10, 11).
3. Hamulus posterioris with truncated head, if seen from lateral side (Fig. 12).

Otherwise this species is very much like *S. chunliuae* especially in the whole body colouration, structure of occiput. It is also interesting to note that this new species is related to South Japanese *S. ryukyuensis* Asahina which is a very small insect but has almost similar structure and colouration with this. Another Taiwanese representative, *S. shirozui* Asahina corresponds to Japanese *S. suzukii* Oguma, a slightly smaller species than the Taiwanese congener.

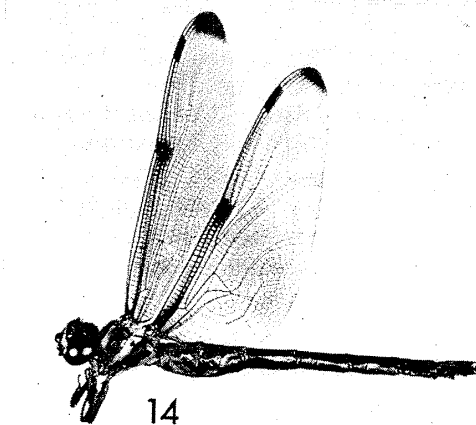
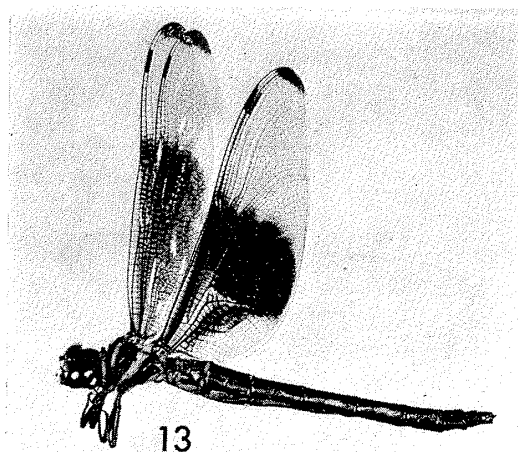
CORDULEGASTERIDAE

6. *Chlorogomphus risi* Chen
 タイワンミナミヤンマ
 1♂ 2♀ Suan chi kou, Taipei
 Prov., 24. V. 1966
 1♀ Kue shan, Taipei Prov., 21.
 VI. 1966

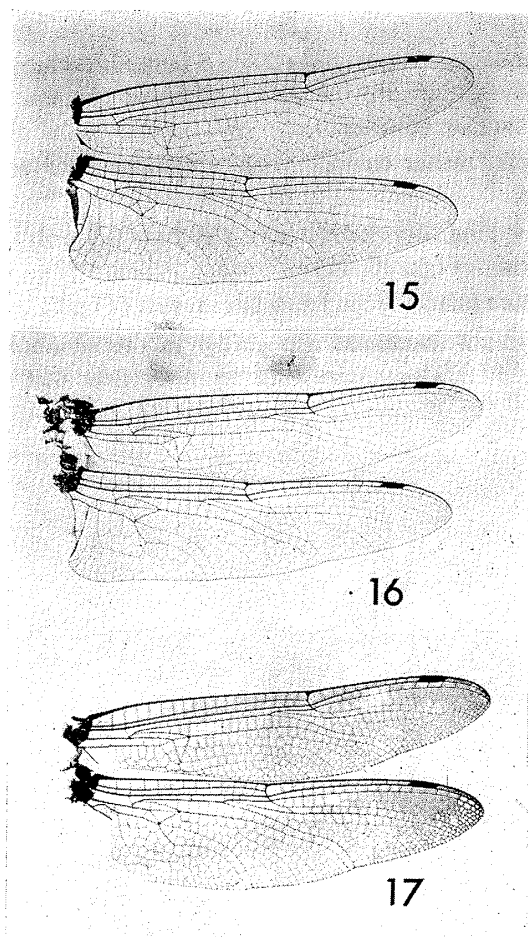
This is a widely distributed Taiwanese *Chlorogomphus*. The wings of the female insects are usually enfumed with pale brown with black tips (Fig. 14), but often tinted with deep brown proximally as shown in Fig. 13. I have another specimen with similar wing pattern in my collection. These must not be confused with *Ch. brunneus brunneus* Oguma of Okinawa which has almost entirely deep brown wings.

MACROMIIDAE

7. *Epophthalmia elegans* Brauer
 オオヤマトンボ



Figs. 13-14. *Chlorogomphus risi* Chen,
 ♀. タイワンミナミヤンマ.
 13: Dark-winged form.
 14: Hyaline-winged form.



Figs. 15-17. Wing venation of *Macromia*.
 15: *Macromia chui* sp. nov., ♂.
 16: *Macromia clio* Ris, ♂ (Yangmingshan).
 17: *Macromia clio* Ris, ♀ (Botansha).

ly developed (Fig. 18), eighth segment with a peculiar small swelling on the middle of lower tergal margin at the posterior end of the yellow patch. (Similar structure is found in *M. daimoji*.)

Anal appendages (Figs. 20, 21) rather slender, superiors not particularly curved interiorly, the inferior much longer than the superiors. Accessory genitalia as that of *M. daimoji* (Fig. 22), hamulus posterioris tapered and pointed.

Female unknown.

Remarks: Allied to *M. daimoji* found in Japan and Korea, but the extremely retarded yellow markings will make the separation quite easy. The specific name is dedicated to the collector, Mr. Y. I. Chu, for his honour.

9. *Macromia clio* Ris タイワンコヤマトンボ

M. clio Ris, Suppl. Ent., 5, p. 67, 1915 "1♀ Hoozan, Formosa (1910, H. Sauter)"

1 ♂ Fukang, Tao yuan Prov.,
 2. VIII. 1966

8. *Macromia chui* sp. nov.

1 ♂ Kue shan, Taipei Prov., 30.
 V. 1966

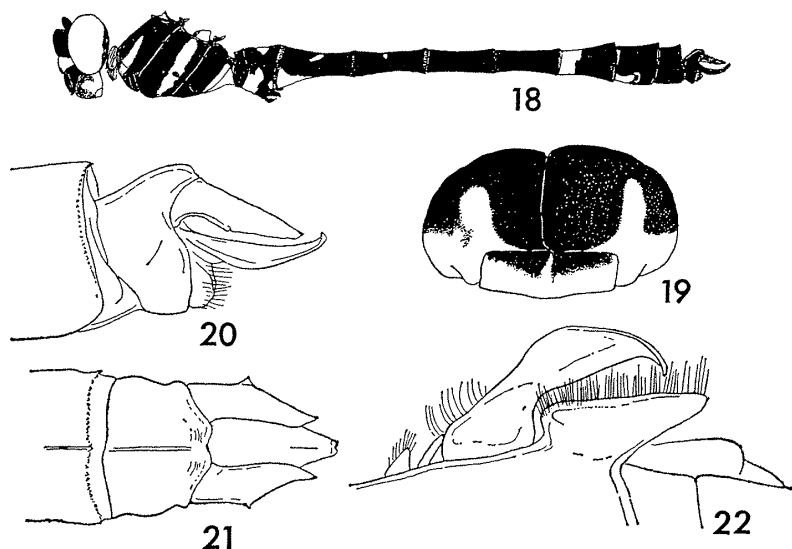
♂ Ad. (Holotype): A slender bronze-green species, abdomen + appendage 57 mm, hindwing 48 mm. In the body structure this comes nearest to Japanese *M. daimoji* but the yellow stripes are very poorly developed (Fig. 18).

Head bronze black, only post-clypeus broadly yellow, mandible all black; labium yellow marked characteristically as shown in Fig. 19.

Thoracic yellow stripes are narrower than those of *M. daimoji*. Legs with keels on the distal half of protibia and on nearly whole length of metatibia. Wings (Fig. 15) hyaline, an area covering the anal angle palely yellow. Neuration rather open as that of *M. daimoji*. Nodal index $\frac{9:17}{11:11} \left| \frac{17:9}{12:10} \right.$

all the triangles free. Triangles of hindwings extremely small. There are eight cells in the anal loop, pterostigma 3 mm, black.

Yellow stripes of abdomen poorly



Figs. 18-22. *Macromia chui* sp. nov., ♂.
 18: Body markings, lateral. 19: Labium, external.
 20-21: Caudal appendages. 22: Accessory genitalia, right side.

M. clio Asahina, Kontyû, 32, p. 304, 1964 "1 ♀ Iriomote Island, 26, V. 1963, leg. Ishida"

1♂ (caudal appendages missing) Yangming-shan, Taipei Prov., 9. IV. 1966, leg. Wong Shiao Ching.

This species has been known rather insufficiently. In this occasion, therefore, I will give a description of undescribed male insect. I have had, beside the present broken specimen, a pair of better examples taken by myself in 1936.

Firstly I will give a description of my female specimen (1 ♀ Botansha, Taiwan, 25. VII. 1936).

♀ Ad., Abdomen 55 mm, hindwing 49 mm.

Head with a yellow spot on the side of mandible, labium clearly demarcated with black and yellow as Fig. 26, there is an ambiguous yellow spot on the side of antefrons. Tibiae not keeled. Abdomen with remarkable yellow markings as shown by Fig. 24. Valvula vulvae with a conspicuous median incision (Fig. 31).

Wings narrow, densely neurated and tinted brownish by aging. Venation coincides well with that figured by Ris (Fig. 17).

I believe this female specimen exactly belongs to Ris' *M. clio*, while the male insect of which a description will follow, has the yellow stripes rather poorly developed (Fig. 23), but the general colour pattern and the head markings will prove that this pair is a single species.

♂ Ad., Allotype (1 ♂ Tipon, Taitung Prov., 30. VII. 1936).

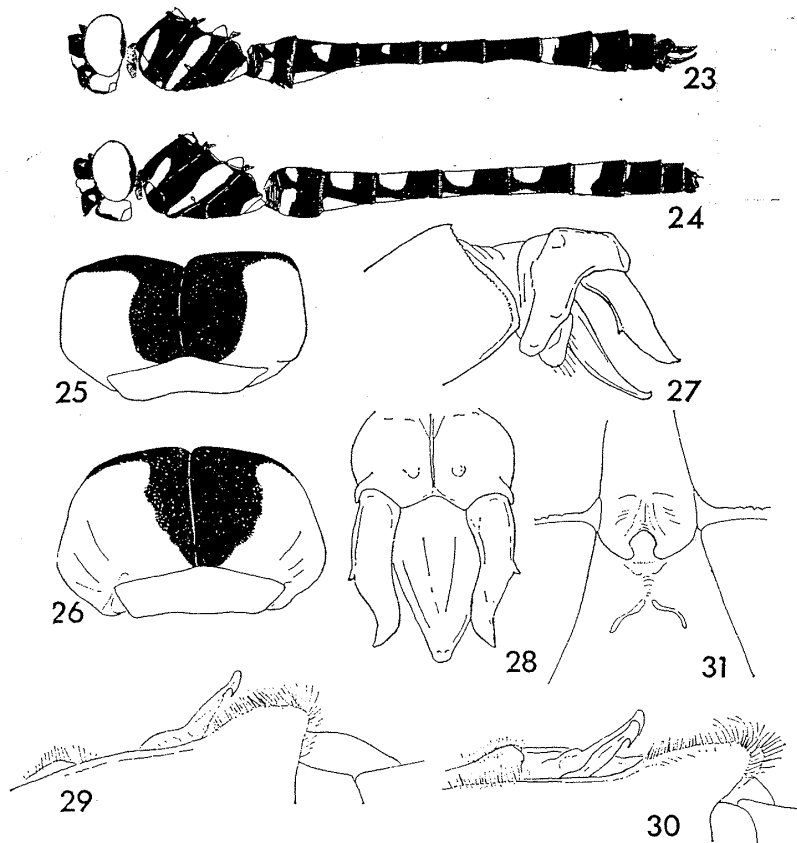
Abdomen+appendage 54 mm, hindwing 44 mm.

Head entirely bronze black excepting the pale yellowish postclypeus, labium

well demarcated with black and yellow as Fig. 23. In the thorax there is a small yellow spot on the lower edge of meso-infraepisternum. Legs keeled on the distal half of protibia and on nearly whole length of metatibia. Wings transparent but very pale suffronated around the anal angle of the hindwing in a rather

teneral specimen here added (Fig. 16). Nodal index $\frac{10:17}{11:12} \mid \frac{18:10}{12:12}$, triangles

$\frac{0}{0} \mid \frac{1}{0}$, anal loop 7-9 celled.



Figs. 23-31. *Macromia clio* Ris. タイワンコヤマトンボ.

- 23: Body markings, lateral, ♂. 24: The same of ♀.
 25: Labium, external, ♂. 26: The same of ♀.
 27-28: Caudal appendages, ♂. 29-30: Accessory genitalia, ♂, right side.
 31: Valvula vulvae, ventral.

Abdomen as Fig. 23, the broad transverse yellow stripe of the third segment broadly interrupted on the sides. In this respect this is allied rather to *M. dai-moji* but the structure of accessory genitalia and caudal appendages are nearly those of *M. amphigena*. The hamulus posterioris is slender hammer-like, apical

claw being sharply recurved (Figs 29, 30). Superior caudal appendage incurved when seen from above, the inferior only slightly longer than the superiors (Figs. 27, 28).

This species distributes both in Taiwan and Iriomote Island of Southern Ryukyus. In Taiwan we can now list three *Macromias*, *M. clio* Ris, *M. chui* Asahina, and *M. urania* Ris. One may say that the first corresponding to Japanese *M. amphigena*, the second to Japanese *daimoji* Okumura.

LIBELLULIDAE

10. *Orthetrum glaucum* Brauer タイワンシオカラトンボ
2♂ 2♀ Punpuchi, Nantow Prov., 4. VI. 1966
11. *Orthetrum luzonicum* Brauer ホソミシオカラトンボ
1♂ Kueshan, Taipei Prov., 30. V. 1966; 1♂ Hsintien, Taipei Prov., 20. V. 1966
12. *Orthetrum pruinsum neglectum* (Rambur) コフキシヨウジョウトンボ
1♀ Chu Yun shan, Taichung Prov., 15. IX. 1965; 1♀ Kueshan, Taipei Prov., 30. V. 1966
13. *Brachydiplax chalybea flavovittata* Ris アオビタイトンボ
1♀ Taipei, 4. VI. 1966
14. *Acisoma panorpoides* (Rambur) コシプトンボ
1♂ Pinglin, Taipei Prov., 23. VI. 1965
15. *Sympetrum eroticum ardens* MacLachlan オオマユタテアカネ
1♂
16. *Trithemis aurora* Burmeister ベニトンボ
1♂ Punpuchi, Nantow Prov., 4. VI. 1966
17. *Trithemis festiva* Rambur セボシトシボ
1♂ Kueshan, Taipei Prov., 30. V. 1966
18. *Zygonyx takasago* Asahina タカサゴトンボ
1♂ Punpuchi, Nantow Prov., 4. VI. 1966
19. *Hydrobasileus croceus* Brauer オオキイロトンボ
1♂ Kueshan, Taipei Prov., 21. VI. 1966; 1♀ Kueshan., 30. V. 1966
20. *Zyxomma petiolatum* Rambur オオメトンボ
1♂ Kueshan, Taipei Prov., 30. V. 1966

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四国西南端でアカギカメムシを採る

宮 武 睦 夫・伊 賀 幹 夫

筆者らは1967年7月下旬、四国西南部において昆虫の採集を行なった。7月24日、高知県の西南端、柏島に近い大堂山展望台入口付近（標高約200m）で、伊賀はアカメガシワの葉裏で抱卵中のアカギカメムシ *Cantao ocellatus* (Thunberg) 2頭を発見、採集した。そこで付近一帯のアカメガシワを注意して探したところ、別の木からは一頭も目撃できなかったけれども、カメムシを最初に発見した木から、さらに抱卵虫の3♀と花穂（雄花）に集っていた3♂を採集することができた。本種は、琉球列島には多産するが、比較的近年になつて屋久島（1952年）、種子島（1958年）、九州南端佐多岬（1959年）から記録され、逐次分布を北に伸ばし、それらの地域では定着していると考えられる。今回、四国の西南端で本種が採集されたことは、それがこの付近にすでに定着していたものか、たまたまそのとき渡来していたものかは今後の調査に俟つとしても、暖地性昆虫の北進の顕著な一例として興味深く思われる。

本種が同じ木に群棲することはすでに観察されているが、そこでも最初本種が発見された木と枝を交えるほど隣接したアカメガシワにさえ全く見出されなかつたのははなはだ不思議に思われた。母虫の卵保護についてもよく知られているが、卵塊は母虫の体形に合わせてほぼ六角形、体に充分覆われるほどの大きさで、10数列に並べて産下されていた。採集した2卵塊の卵数は185と191であつた。卵ははじめ鮮かな乳白色であつたが、やがて淡紅色をおび、5～6日後には一斉に孵化しはじめた。孵化幼虫はそのまま卵殻上に密集し、ほぼ5日後に脱皮して2令になつたがその後ほうまく育たなかつた。なお2令幼虫の口吻は長いけれども、オオキンカメムシのように腹端を超えることはなかつた。

終りに、本種の分布や生態の記録について御教示下さつた石原 保教授と長谷川 仁技官に厚くお礼申し上げる。