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A Revised List of the Odonata of Hong Kong

Part II. Anisoptera

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Abstract Thirty-eight species of anisopterous dragonflies from Hong Kong area are enumerated. These include four previously undetermined and three newly added species. In place of "*Leptogomphus perforatus* subsp. (?)", *L. elegans hongkongensis* subsp. nov. is proposed.

In this second part of a revision of the odonate fauna of Hong Kong, thirty-eight species belonging to the suborder Anisoptera are treated. One of the previously undetermined forms, "*Gomphus* sp." revealed to include two species, "*Asiagomphus hainanensis* (CHAO)" and "*Asiagomphus septimus* (NEEDHAM)", both have not exactly been recorded from Hong Kong. Another undetermined form, "*Gynacantha* sp." was proved to be *Gynacantha saltatrix* MARTIN. "*Leptogomphus perforatus* subsp. (?)" was re-examined, and it was concluded to belong to the species *L. elegans* LIEFTINCK described from Kuatun, Fukien, and the former is here treated as subsp. *hongkongensis* nov. based on the structure of the inferior appendage. Here are three new additions: *Heliogomphus scorpio* (RIS), *Tetracanthagyna waterhousei* MACLACHLAN and *Rhyothemis triangularis* KIRBY, the second one having been bred out by Dr. DUDGEON.

Here again the cooperation of Dr. DUDGEON and Mr. K. MATSUKI is sincerely acknowledged. The immature stage of these dragonflies will be studied in future by Mr. MATSUKI regarding the forms of which a sufficient material became available. I am also indebted to Dr. Masami HAYASHI and Mr. Kiyoshi INOUE for their help in studying some interesting materials.

I. Gomphidae

1. *Asiagomphus hainanensis* (CHAO)

Gomphus sp.: ASAHINA, 1965, p. 499, "1 ♂, Tai Po Kau, 21. IV. 1965, leg. HIRASHIMA; 1 ♀, Tai Mao Shan, 21. IV. 1965, leg. S. AE; 1 ♂, Lam Tsuen Valley, 30. V. 1965.

Gomphus hainanensis: ASAHINA, 1966 (partim), p. 111, figs. 12–16 (♂ app., acc. gen. ♀ postfrons + occiput, ♀ abd. end) "Hong Kong material (2 ♂ 1 ♀ same as noted in 1965)."

In my 1965 list I recorded 2 ♂ 1 ♀ specimens as "*Gomphus* sp.", and in 1966 I placed the same material in "*Gomphus hainanensis* CHAO." However, I have found now that the Hong Kong female "1 ♀, Tai Mao Shan, 21. IV. 1965, leg.

S. A." is misidentified. Indeed, the figures 15 and 16 of female characters are those of *Asiagomphus septimus* (NEEDHAM). The posterior part of the female head is here illustrated for *A. hainanensis* for the first time, based on a Taiwanese specimen.

In this female, the postfrontal tubercle is prominent, making a widely divided ridge directed backwards, and the apices are obtusely pointed. There are further, on the lateral side, small sharply pointed spines. The posterior border of the occiput is not roundly produced, but is rather flat with a small median cleft (Fig. 1).

2. *Asiagomphus septimus* (NEEDHAM)

Gomphus sp.: ASAHINA, 1965, p. 499 (partim), "1 ♀, Tai Mao Shan, 21. IV. 1965, leg. S. A."
Gomphus hainanensis: ASAHINA, 1966, p. 111 (partim), figs. 15–16, "1 ♀, Tai Mao Shan, 21. IV. 1965, leg. S. AE."

This is an additional species as stated in the description of the preceding species.

3. *Heliogomphus scorpio* (RIS)

Leptogomphus scorpio RIS, 1912, pp. 72–73, fig. 12 a–b (♂ app.), fig. 13 (♂ acc. gen.), Taf. 5, fig. 2 (♂ thoracic pattern); "1 ♂ 1 ♀, Tsa-Yiu-San, 23 & 20. VII. 1910, leg. MELL, Mus. Koenigsberg."
Heliogomphus scorpio: LAIDLAW, 1925, p. 560 (list only).
Heliogomphus scorpio: FRASER, 1942, p. 334 (list), 335 (key), 339 (figs. 3–12: pteroth. pattern), pl. 1, fig. 9 (♂ app.), "South China."
Heliogomphus scorpio: CHAO, 1954, pp. 227–230, figs. 321–322 (♂ wings), figs. 323–331 (♂ occiput, ♀ occiput, ♂ app., acc. gen., penis, ♀ v.v., pteroth. pattern), "Fukien, Kwangtung."

Material examined. 1 ♀, Tai Po Kau, 31. X. 1977, leg. DUDGEON; 1 ♂, Kwangtung, China, leg. Dr. MELL (Erich Schmidt Collection).

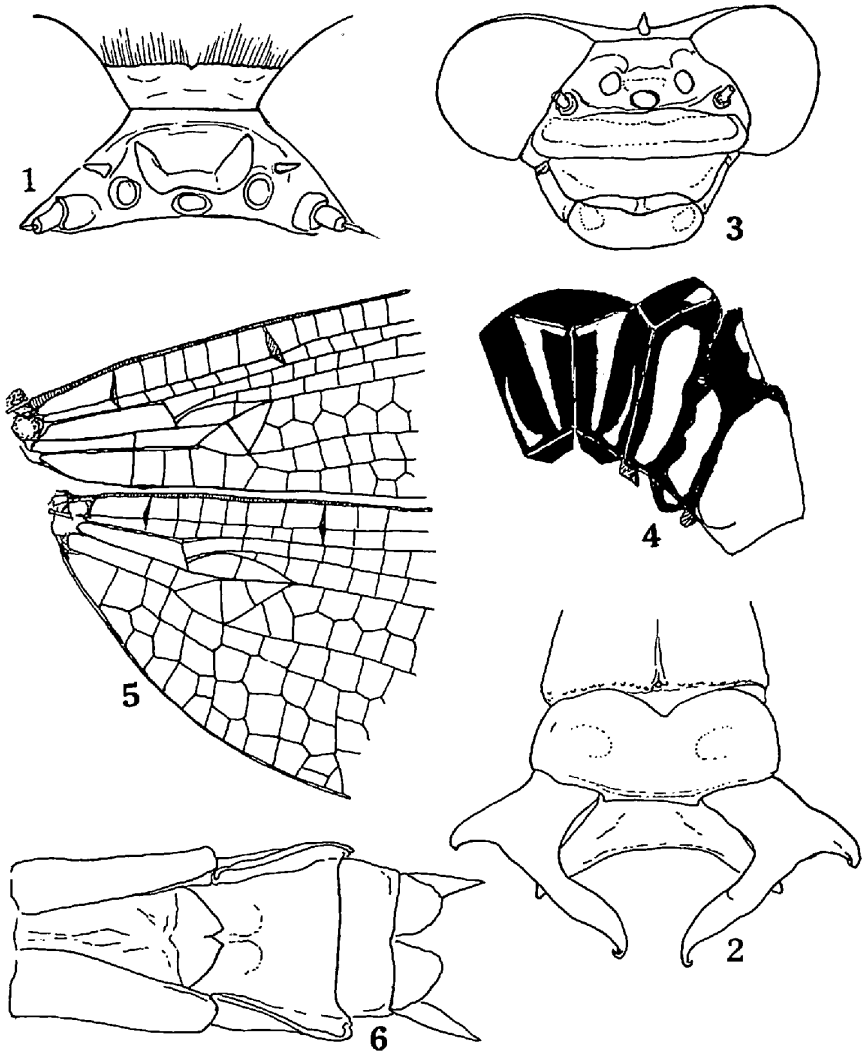
This is a remarkable species already known from Kwangtung area since the first record by MELL (1910) and the description of RIS (1912). Although it has not been found in our collection, a number of its larval specimens were taken by Dr. DUDGEON at Tai Po Kau. These are remarkable larvae with broadly expanded antennal segments, which is a peculiar character of *Heliogomphus*. Now, we found a female specimen taken at Tai Po Kau Forest, and this is described herein briefly. On this occasion the remarkable male caudal appendages are also illustrated based on a male specimen taken at Kwangtung by MELL (Fig. 2).

♀ (ad.): Abd.+app. 46 mm, hindwing 41 mm. A slender insect, body deep black striped with yellow.

Head black, labrum with paired small spots on the sides, anterior frons striped narrowly with yellow, occiput with a remarkable short median spine (Fig. 3).

Pterothorax striped as shown in Fig. 4; legs entirely black, distal end of hind femur reaching only the end of the first abdominal segment, femoral spines not very strong.

Wings narrow, venation close, all the supertriangles are crossed, and the triangle of hindwing also crossed as that of a *Davidius* species (Fig. 5). Nodal-index: 14: 20:: 21: 16/15: 15:: 16: 15.



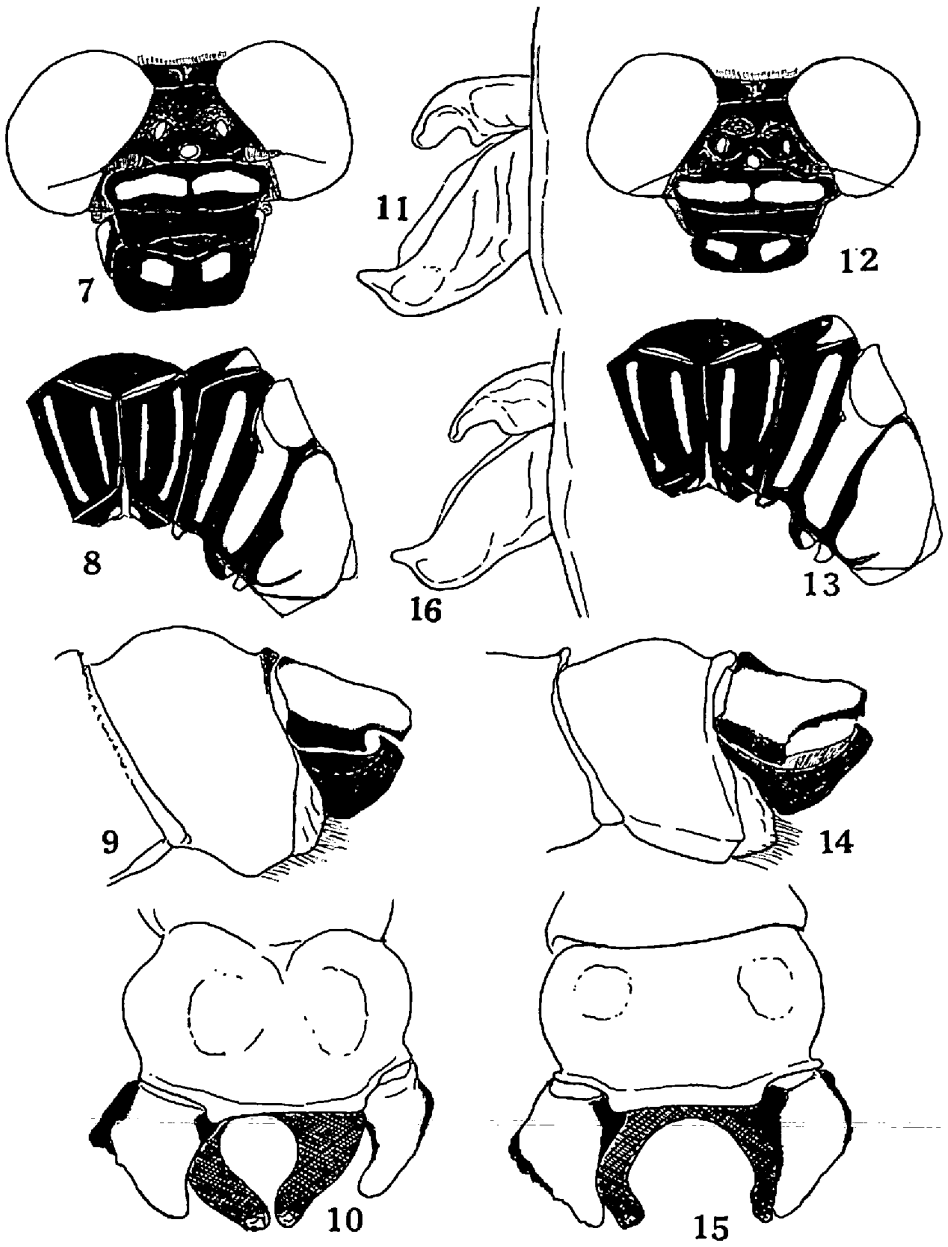
Figs. 1–6. —— 1. *Asiagomphus hainanensis* (CHAO), ♀, Hong Kong, frons and occiput, dorsal. —— 2–6. *Heliogomphis scorpio* RIS, Kwangtung ♂, Hong Kong ♀. —— 2, ♂ Caud. app.; 3, ♀ head, frontal; 4, ♀ pterothoracic pattern; 5, ♀ wing base; 6, ♀ distal abdominal segments, ventral.

Abdomen slim and black, sides of basal three segments yellowish striped, 4–7 segments with a basal yellow spot on the side, 8–10 segments and cerci very short, and entirely black; valvula vulvae also deep black, short and bilobed distally (Fig. 6).

A male specimen in the Schmidt Collection shows a similar colour pattern and wing venation, but the three terminal abdominal segments are broadened with enormously developed caudal appendages (Fig. 2).

4. ***Leptogomphus elegans hongkongensis*** subsp. nov.

Leptogomphus perforatus subsp. (?): ASAHINA, 1965, p. 500, fig. 16 (♂ acc. gen.), fig. 17 (♂ caud. app.), "1 ♂, Lam Tsuen Valley, 24. VII. 1964 (paratype); 1 ♂ (paratype), Tai Po Kau, 29. V.



Figs. 7–16. —— 7–11. *Leptogomphus elegans hongkongensis* nov., ♂. —— 12–16. *Leptogomphus elegans elegans* LIEFTINCK, Kuatun, Fukien, ♂. —— 7, 12, Head markings, frontal; 8, 13, pterothoracic pattern; 9, 14, caudal appendages, lateral; 10, 15, do., dorsal; 11, 16, accessory genitalia, lateral.

1965; 1 ♂ (Holotype), Lam Tsuen Valley, 30. V. 1965."

No additional material taken.

In my previous paper I briefly treated with some doubt these three males to be something closely allied to *L. perforatus* RIS. Since Dr. CHAO discussed this

group in his recent paper (CHAO, 1982, p. 298), however, I checked the Erich Schmidt Collection at my hand where I found a number of *L. elegans elegans* LIEFTINCK (1948 a) taken from Kuatun, Fukien. I now inclined to treat our Hong Kong males to be a local race of *L. elegans*. The similarity to and the differences from *elegans* may be summarized as noted below.

♂ (ad.): Abd.+app. 46–48 mm, hindwing 39–40 mm (*elegans* 45–46, 37–40 mm).

Head and pterothorax patterned as shown in Figs. 7–8. The paired yellow spots on the labrum are subquadrangular. Occiput slightly swollen at the centre, with almost straight posterior border fringed with hairs (Fig. 7).

All the yellow stripes on the front of pterothorax are very narrow, the antehumeral (juxtaposed) yellow stripe is entire (Fig. 8), while it is interrupted in the case of *elegans elegans* (Fig. 13).

Inferior appendage black, as long as the superior. The divided arms are almost enclosing a round area, ending in an attenuated apices which are almost touching each other (Fig. 10). In *elegans elegans* the arms are widely open (Fig. 15).

Accessory genitalia is shown in Fig. 11, almost the same as those of *elegans elegans* (Fig. 16).

Female unknown.

5. *Onychogomphus sinicus* CHAO

Onychogomphus sinicus CHAO, 1954, p. 264 (Fukien and Kiangsu).
Onychogomphus sinicus: ASAHINA, 1965, p. 459, "1 ♀, Lam Tsuen Valley, 24. VII. 1964; 2 ♂, Tai Po Kau, 27. VII. 1964; 1 ♀, Tai Po Kau, 29. V. 1965."

In my 1965 record, I stated "compared with the original description this is slightly smaller in size and the black of the thorax is more extended." Now I am giving a brief description of our specimens.

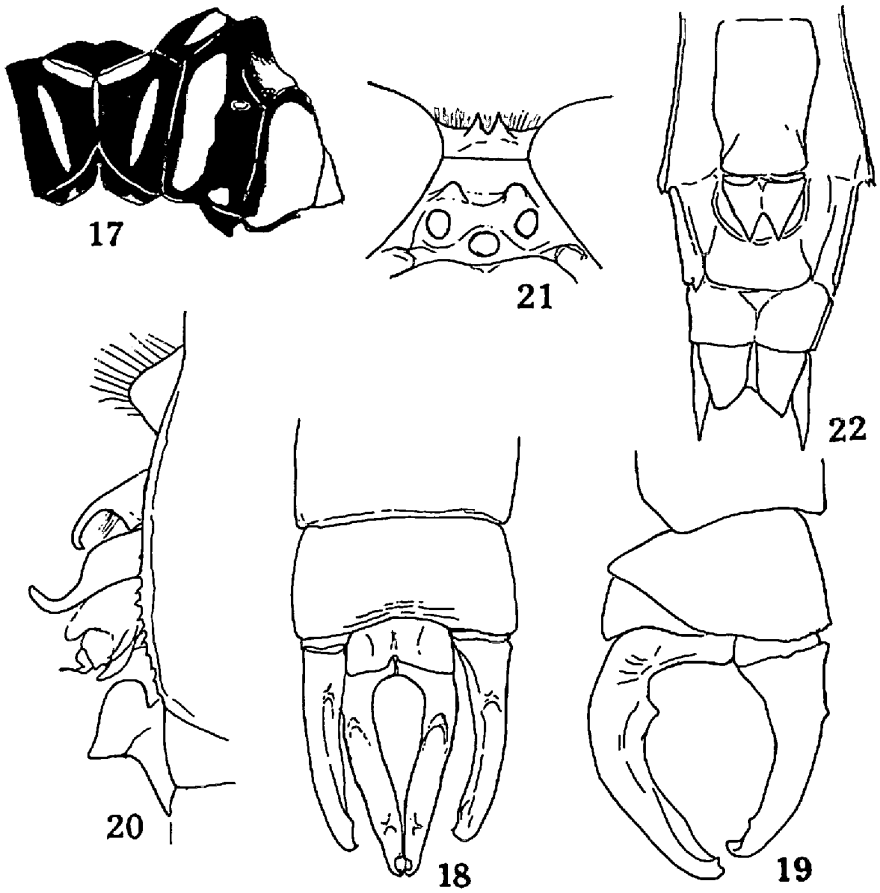
♂ (ad.): Abd.+app. 43–46.5 mm, hindwing 33–38 mm.

Head shing black, labrum with a pair of long spots basally, anteclypeus entirely yellow, postclypeus and antefrons black with a broad upper stripe on the dorsal side of the latter, postfrons with a paired eyebrow-like swelling behind the lateral ocelli, occiput margined with long hairs posteriorly.

Pterothorax patterned as shown in Fig. 17. The pattern is the same as that illustrated by CHAO (1954, p. 264, fig. 444), but the yellows are more degenerated. Wings hyaline, nodal-index in one specimen: 13: 15:: 16: 12/13: 12:: 11: 13.

Abdomen deep black, striped yellowish, segment 1 with lateral spots, 2 with middorsal streak broadened anteriorly and pointed posteriorly, lateral side with two spots, the anterior one including the auricle. Segments 3–7 with basal yellow ring, the last one occupying the anterior half of 7th segment. Last three segments strongly expanded with ventral fringe on 8 and 9.

Caudal appendages as shown in Figs. 18 and 19, the superior palely browned



Figs. 17–22. *Onychogomphus sinicus* CHAO, ♂ ♀, Hong Kong; 17, ♂ pterothoracic pattern; 18, 19, ♂ caudal appendages; 20, ♂ accessory genitalia; 21, ♀ postfrons and occiput, dorsal; 22, ♀ distal abdominal segments, ventral.

at the basal 1/4, then much yellowish tinted externally. Low processes are present on the dorsum at the basal 1/3, and subapically.

Interior appendage longer than the superiors and broadly divided embracing a median gulf, with subapical process and a rather divided hook.

Accessory genitalia is shown in Fig. 20. The anterior hamulus is a claw but its anterior process is not sharply pointed as illustrated by CHAO (fig. 440).

♀ (ad.): Abd.+app. 40 mm, hindwing 34 mm.

In this single specimen, the head is coloured as that of the male insect. On the head, the eyebrow-like ridges behind the lateral ocelli are stronger and the occiput is provided with paired and sharply pointed spines, standing upright (Fig. 21).

Abdomen coloured and patterned as in the male insect; there is a single large lateral spot on the side of the second segment. The yellow basal rings on 3–6 segments narrowed at the middorsal line.

Cerci longer than the length of 10th abdominal segment, narrow, and sharply pointed. Valvula vulvae of a bilobed process with pointed apices, coloured shining

brownish entirely (Fig. 22).

Remarks. Our Hong Kong material is slightly smaller in size and the yellow pattern is more diminished than those described by CHAO (1954), but I believe these are exactly identical species.

II. Aeschnidae

6. *Anaciaeschna jaspidea* (BURMEISTER)

ASAHINA, 1965, p. 500, "2 ♂, Castle Peak Station, 23. VII. 1964; 1 ♀, Kam Tsien, 23. VII. 1964."

No additional material taken.

7. *Anax guttatus* (BURMEISTER)

ASAHINA, 1965, p. 500, "1 ♂, Lam Tsuen Valley, 24. VII. 1964; 1 ♂, Saikung, 25. VII. 1964."

No additional material taken.

8. *Anax parthenope julius* BRAUER

Anax julius BRAUER, 1866, p. 61 (key), "China (Hong Kong)."

No additional material available.

9. *Anax immaculifrons* RAMBUR

RIS, 1916, p. 63, "1 ♂, Victoria Peak, Hong Kong (9. V. 1881).
NEEDHAM, 1930, p. 73, "Hong Kong southward" (ex RIS, 1916).
ASAHINA, 1965, p. 500, "1 ♀, Pok Fulah, 20. V. 1965, leg. THORNTON."
ASAHINA, 1986, pp. 100–104.

No additional material. For the details of Hong Kong material, refer to my 1986 paper.

10. *Gynacantha saltatrix* MARTIN

Gynacantha sp.: ASAHINA, 1965, p. 500, "2 ♀, Tai Po Kau, 2. VII. 1964,"

No additional material obtained.

In my previous list this species was left undetermined as to the species. For the details of this species, refer to my recent paper on Thai Aeschnidae (Tombo, **29**: 89–91, 1986). I also listed this species from "Foochow" based on the Kellogg Collection (ASAHINA, 1978, Tombo, **21**: 7).

11. *Tetracanthagyna waterhousei* MACLACHLAN

Material studied. 1 ♀ (teneral), Tai Po Kau, in spring 1980, bred out!

A quite teneral specimen. This species is a new addition to the Hong Kong fauna. For this species I have recently described and illustrated a female specimen taken in Thailand (ASAHINA, 1986).

III. Corduliidae

12. *Epophthalmia elegans* (BRAUER)

ASAHINA, 1965, p. 500, "1 ♀, Belcheis st., Hong Kong, 4. IX. 1953, leg. D. ROMER."

No additional material available. This single female specimen recorded in 1965 is characterized by the expanded yellow markings which appear to be common with some other examples taken in the Asiatic continent.

13. *Macromidia rapida* MARTIN

Macromidia rapida MARTIN, 1906, pp. 79–80, fig. 92 (♂ wings), 93 (♂ app.), pl. 3, fig. 18 (♂ total figure), "Habitat: Tonkin."

Macromidia rapida: ASAHINA, 1965, p. 500, "1 ♂ 1 ♀, Ho Chung, 31. V. 1965."

Additional material. 1 ♀, Tai Po Kau, 17. VI. 1973, leg. M. HAYASHI.

As this species has been neither described nor illustrated after the original record of MARTIN (1906), the following will be of interest.

♂ (juv.): Abd.+app. 38 mm, hindwing 32 mm. Dark metallic greenish tinted and distinctly striped with yellow.

Head dark reddish brown, upper part of antefrons and postfrons dark metallic green, occiput shining black, labium pale brownish.

Pterothorax shining metallic green, lower portion of mesepisternum dark reddish brown. A broad stripe present broadly covering metepisternum; posterior margin of metepimeron and meta-postepimeron, as well as interalar sclerite, entirely yellow (Fig. 23).

Legs dark brownish, coxae paler. Wings hyaline, extreme base of both wings very slightly browned, pterostigma long, 3 mm, black coloured. Antenodal-index: 10: 16:: 17: 11/13: 11:: 11: 13.

Abdomen bronze black, paler in proximal three segments. Yellowish striped on the middorsal line (Fig. 24), and lateral side of basal two segments (Fig. 23).

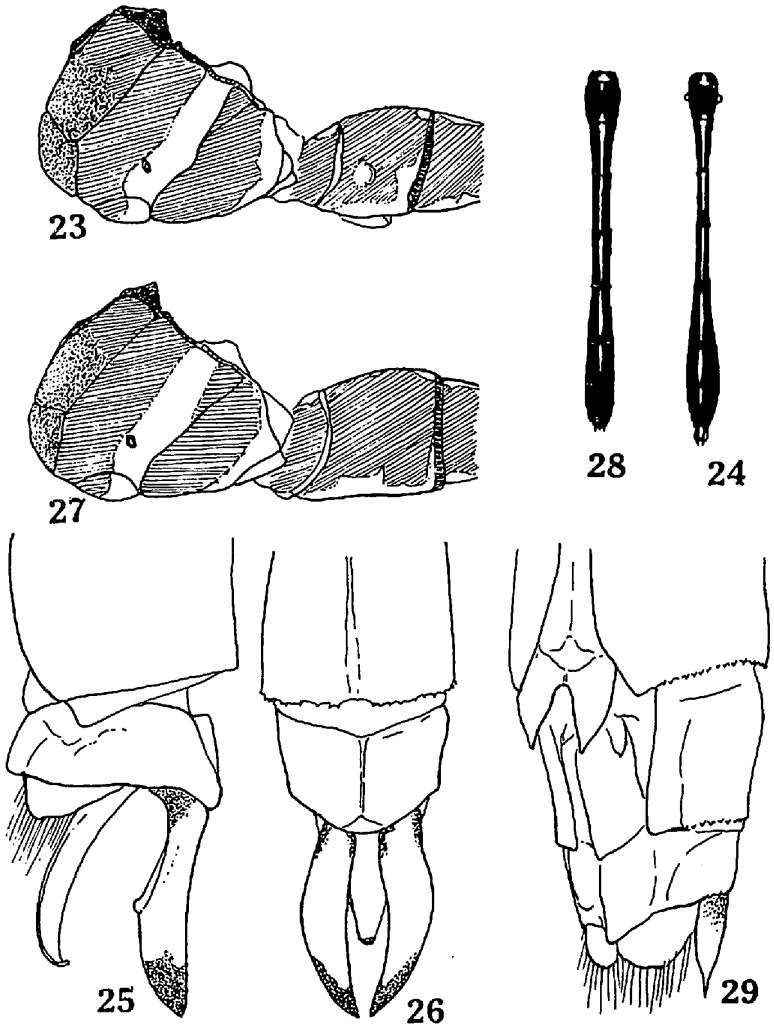
Caudal appendages of typical macromidid type (Figs. 25–26), the superior dark yellowish with dark base and apex. Inferior appendage pale brownish with dark tinted apex. Accessory genitalia on the second segment is badly twisted in this specimen.

♀ (ad.): Abd.+app. 40 mm, hindwing 36 mm.

Head and thorax patterned as those of the male insect. Wings hyaline and broad. The maximum width at the nodus 11.5 mm (in ♂ 10.2 mm). Wing bases with deep brownish striae in the space *sc* and *cu*, the striae almost reaching the second antenodal cross-vein. In the hindwing the brownish patch extends along the membranule.

Abdomen bronze black striped as shown in Figs. 27–28. Cerci yellowish with black tip.

Valvula vulvae well produced in our females, black and deeply divided with pointed lobes (Fig. 29).



Figs. 23–29. *Macromidia rapida* MARTIN, ♂ ♀, Hong Kong; 23, ♂ markings of pterothoracic and basal abdominal segments, lateral; 24, ♂ abdominal pattern, dorsal; 25, 26, ♂ caudal appendages; 27, ♀ markings of pterothoracic and abdominal segments, lateral; 28, ♀ abdominal pattern, dorsal; 29, ♀ distal abdominal segments, oblique ventral.

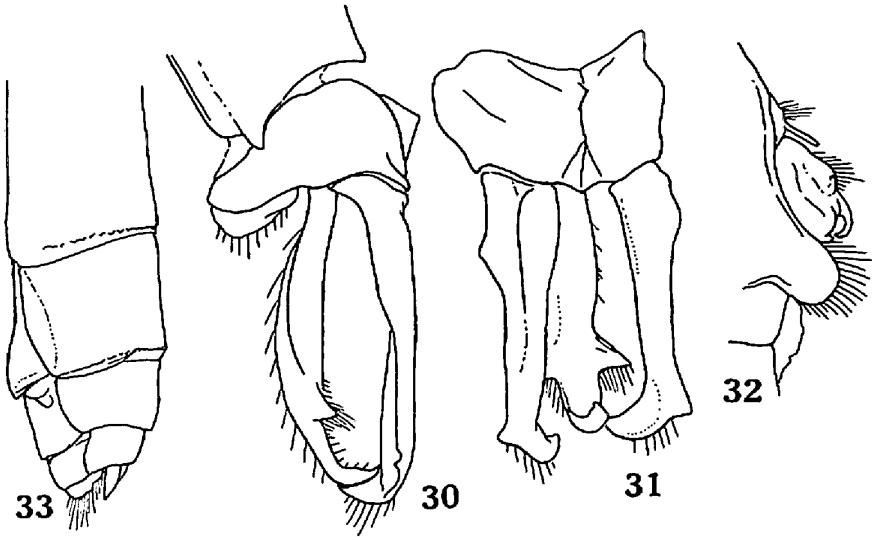
Remarks. This species is easily separated from *M. genialis* and its races by the body patterns.

14. *Idionyx yolanda* SELYS

ASAHINA, 1965, p. 501, "1 ♂ 1 ♀, Tai Po Kau, 29. V. 1965"; "Coll. Bishop Mus.: 1 ♂, Sha Tin, N. T., V. 1958, leg. H. L. H. KRAUSS,"

No additional material taken.

This Malaysian species has been known from Malaya, Sumatra, Billiton, Borneo, and Basilan, so that its occurrence in Hong Kong may be of considerable interest. In addition to my previous figures of the male insect (Figs. 30–32), the female valvula vulvae is illustrated here (Fig. 33).



Figs. 30–33. *Idionyx yolanda* SELYS, Hong Kong; 30, 31, ♂ caudal appendages; 32, ♂ accessory genitalia; 33, ♀ distal abdominal segments, lateral.

IV. Libellulidae

15. *Lyriothemis elegantissima* SELYS

ASAHINA, 1965, p. 501, "1 ♂, Tai Po Kau, 27. VII. 1974; 1 ♂ 1 ♀, Do., 29. V. 1965."

Additional material examined. 1 ♂, Tai Po Kau, 17. VI. 1987, leg. S. ASAHINA; 1 ♂, Do., 17. VI. 1987, 2 ♂ 1 ♀, Do., 22. VI. 1987, leg. K. MATSUKI.

16. *Orthetrum sabina* (DRURY)

ASAHINA, 1965, p. 501, "1 ♂, Castle Peak Station, 23. VII. 1965."

17. *Orthetrum luzonicum* BRAUER

ASAHINA, 1965, p. 501 (High Altitude Station, Tai Mao Shan, Pak Kong, Lam Tsuen Valley, Ho Chung).

Additional material taken. 3 ♂, Sam A Chung, 20. VI. 1987, Leg. S. ASAHINA; 3 ♂, Do., 20. VI. 1987, leg. K. MATSUKI.

18. *Orthetrum glaucum* BRAUER

Orthetrum glaucum: RIS, 1910, p. 233, "Coll. RIS: —1 ♂ Victoria Peak, Hong Kong, (RIS, 9. V. 1891)." —— NEEDHAM, 1930, p. 132, "From the Amer. Mus. Nat. Hist., I have a pair collected in Hong Kong." —— ASAHINA, 1965, p. 501 (Lam Tsuen Valley, High Altitude Station, Tai Po Kau, Tai Po Market, Pokfulum Reservoir, X. 1958 (leg. THORNTON), Sha Tin).

Additional material taken. 1 ♂, Sam A Chung, 20. VI. 1987, leg. S. ASAHINA; 1 ♂, Do., leg. K. MATSUKI.

20. *Orthetrum triangulare melania* SELYS

Orthetrum melania: NEEDHAM, 1930, p. 134, "From R. LEFEVRE collected in Tsingtao and Hong Kong."

Orthetrum melanium: KLOTS, 1947, p. 10, "Kwangtung, Hong Kong, ♀ Sept. 22, '20, Peak Hotel (H. E. CARPENTER)."

Orthetrum triangulare melania: ASAHINA, 1965, p. 502 (High Altitude Station, Lam Tsuen Valley, Tai Po Kau).

Additional material taken. 1 ♂, Tai Po Kau, 22. VI. 1987, leg. S. ASAHINA.

21. *Orthetrum chrysis* (SELYS)

ASAHINA, 1965, p. 502, "1 ♂, Tai Po Kau, 27. VII. 1964; 2 ♂, Ho Chung, 31. V. 1965."

Additional material taken. 2 ♂, Tai Po Kau, 17. VI. 1987; 1 ♂, Do., 22. VI. 1987; 1 ♂, Sam A Chung, 20. VI. 1987, all leg. K. MATSUKI.

22. *Potamarcha congener* RAMBUR

Potamarcha obscura: ASAHINA, 1965, p. 502 (Castle Peak Station, Hong Lok Yuen, Pak Ngnau Shek, Lam Tsuen Valley, Tai Po Kau).

23. *Palpopleura sexmaculata* (FABRICIUS)

ASAHINA, 1965, p. 502 (Tai Po Market, Tai Po Kau, Lam Tsuen Valley).

24. *Acisoma panorpoides panorpoides* (RAMBUR)

ASAHINA, 1965, p. 502 (Tai Po Market, Ho Chung, Pak Kong, Saikung).

Additional material taken. 1 ♂ 1 ♀, Sam A Chung, 20. VI. 1987, leg. K. MATSUKI.

25. *Brachydiplax chalybea flavovittata* RIS

ASAHINA, 1965, p. 502, "1 ♀, Hochung, 22. IV. 1965, leg. T. SHIRÔZU."

Additional material taken. 1 ♂, Sam A Chung, 20. VI. 1987, leg. S. ASAHINA; 1 ♂, Do., leg. K. MATSUKI; 2 ♂ 2 ♀, Mai Po Marsh, 20. VI. 1987, leg. S. A.; 1 ♂ 2 ♀, Do., leg. K. MATSUKI.

26. *Brachythemis contaminata* (FABRICIUS)

ASAHINA, 1965, p. 502, "3♂, Castle Peak Station, 23. VII. 1965."

Additional material taken. 2 ♂, Mai Po Marsh, 23. VI. 1987, leg. S. ASAHINA.

27. *Diplacodes trivialis* (RAMBUR)

Diplacodes trivialis: RIS, 1916, p. 76, "5 ♂ 1 ♀, Fangling, Südchina, 24. VII. 1914, Dr. L. MARTIN."
—— ASAHINA, 1965, p. 502, "2 ♀, Hong Kong, X. 1958, leg. THORNTON."

28. *Neurothemis tullia tullia* (DRURY)

N. tullia tullia: RIS, 1910, p. 561, "Coll. RIS: —1 ♀ Hong Kong (IV. 91, RIS); 1 ♂ Hong Kong

(7. VII. 1891, Dr. A. SEITZ)." —— ASAHINA, 1965, p. 502, "Castle Peak Station, Tai Mon Tsai, Ho Chung, Pok Kong)."

N. tullia: RIS, 1916, p. 76, "12 ♂ 1 ♀, Fangling bei Kaulun, Südchina (24. VII. 1914, Dr. L. MARTIN)."

Additional material taken. 1 ♂, Sam A Chung, 20. VI. 1987, leg. S. ASAHINA; 1 ♂, Mai Po Marsh, 23. VI. 1987, leg. K. MATSUKI.

29. *Neurothemis fulvia* (DRURY)

ASAHINA, 1965, pp. 502–503 (Lam Tsuen Valley, Tai Mon Tsai, Tai Po Kau, Tai Po Market, Ho Chung).

Additional material taken. 1 ♂, Sam A Chung, 20. VI. 1987, leg. S. ASAHINA.

30. *Crocothemis servilia* (DRURY)

C. servilia: RIS, 1916, p. 76, "5 ♂ 2 ♀, Fangling, Südchina (24. VII. 1914, Dr. L. MARTIN)." —— ASAHINA, 1965, p. 503 (Castle Peak Station, Tai Po Kau; Hong Kong, X. 1958, leg. THORNTON).

Additional material taken. 1 ♀, Mai Po Marsh, 23. VI. 1987, leg. S. ASAHINA; 2 ♂ 1 ♀, Do., leg. K. MATSUKI.

31. *Trithemis aurora* (BURMEISTER)

T. aurora: RIS, 1912, p. 775, "Coll. RIS: Victoria Peak, Hong Kong (RIS, 9. 5. 91)." —— ASAHINA, 1965, p. 503 (Kam Tsin, Fish Pond, Hong Lok Yuen. Tai Po Kau, Pak Ngnau Shek, Saikung, Pokfulum Reservoir, X. 1958, leg. THORNTON; Lam Tsuen Valley).

Additional material taken. 1 ♂, Tai Po Kau, 17. VI. 1987, leg. K. MATSUKI.

32. *Trithemis festiva* (RAMBUR)

ASAHINA, 1965, p. 503 (Tai Po Kau, High Altitude Station, Pak Ngnau Shek, Tai Po Market, Lam Tsuen Valley, Ho Chung).

Additional material taken. 1 ♂ 1 ♀, Lam Tsuen Valley, 18. VI. 1987, leg. K. MATSUKI.

33. *Zygonyx iris insignis* (KIRBY)

Zygonidia insignis KIRBY, 1900, pp. 533–534, pl. XII, fig. 1 (♂ total fig.), "Two specimens only obtained" (♂ Hainan Island).

Zygonyx iris insignis: ASAHINA, 1965, p. 504 (Tai Po Kau, Tai Po Market, Tai Mao Shan, Lam Tsuen Valley, Ho Chung).

Additional material taken. 1 ♂, Tai Po Kau, 17. VI. 1987; 1 ♂, Do., 22. VI. 1987, leg. S. ASAHINA; 1 ♂ 1 ♀, Sam A Chung, 20. VI. 1987, leg. S. ASAHINA; 2 ♂ 3 ♀, Do., 20. V. 1987, leg. K. MATSUKI.

In my 1965 list I tentatively identified our Hong Kong specimens with the subspecies *insignis* KIRBY (1900) which was described as indigenous to Hainan Island. Through the kindness of Mr. K. INOUE, I had a good opportunity to compare our Hong Kong material with real Hainanese specimens which were taken

in recent years by Mr. K. KITAWAKI. We now believe that both Hainan and Hong Kong specimens are taxonomically identical.

KIRBY's original description of "*Zygonidia insignis*" is of very old style, but I noted some peculiarities observed in Hong Kong material (ASAHINA, 1965, p. 504). In the present paper a revised description based mainly on Hong Kong material will be given below.

♂ (ad.): Abd.+app. 38–45 mm, hindwing 46–50 mm.

I believe this is, along with Taiwanese *Z. takasago*, the largest species in the *iris* series, ranging most northeastern area of the group distribution. Ground colour of the body is largely pale orange yellow striped extensively with metallic green, changing much darker by the reduction of yellowish patterns.

Head pale orange yellow, marked dark metallic violet. Labrum dull yellowish, the median lobe and the inner side of lateral lobe, ca. 1/3 or 1/2 width of the lateral lobe black, but less darkened in teneral stage. Labrum deep brown with the centre paler tinted, changing entirely shining black in aged stage. Ante- and postclypeus up to the height of antefrons light yellow, changing into dark yellow; a semicircular black stripe developed on the front border of postclypeus. Postfrontal vesicle deep violet, occipital triangle shining black.

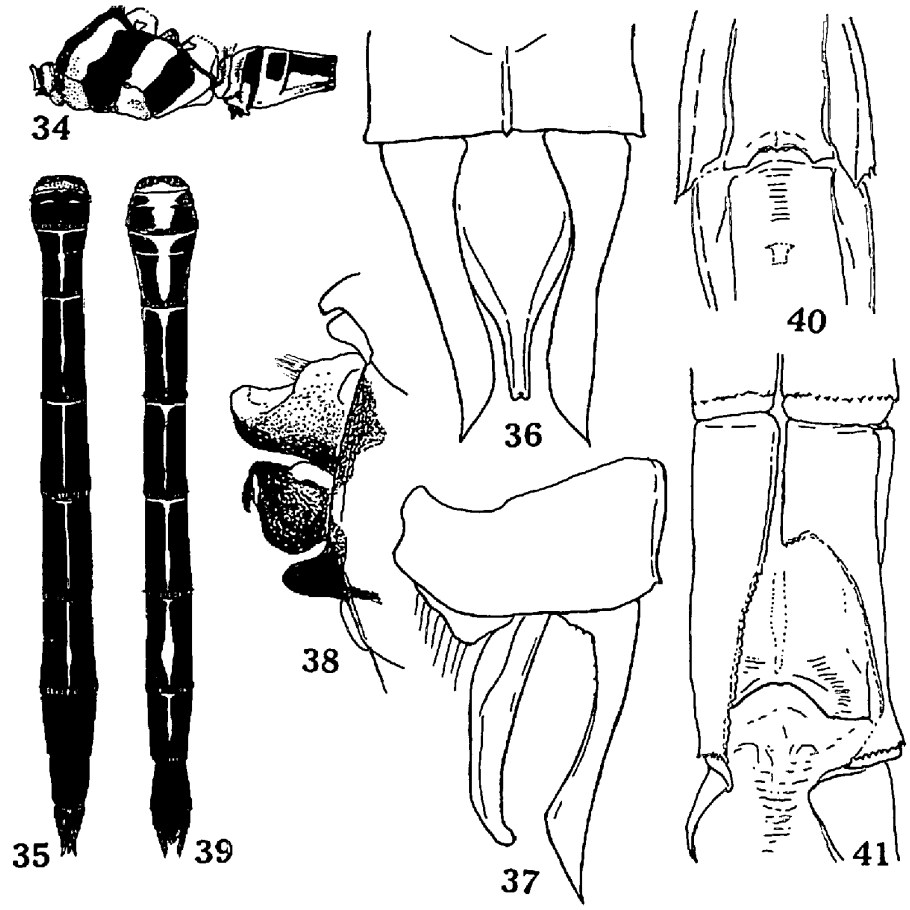
Pterothorax broadly striped with yellow and metallic green (Fig. 34), but in aged males the yellow bands are almost entirely darkened leaving only dirty brownish vestiges. Legs black, forefemora and coxae brownish in teneral stage, changing into black entirely. Some authors stated the presence of three longer spines at the inner distal ridge of metafemur.

Wings hyaline, narrow and long. The extreme bases faintly browned, its extent being variable, fairly broadly but palely in teneral stage; in aged stage degenerating into 2–3 cells along the membranule in the hindwing. Wing apices generally smoked entirely distal to the pterostigma. All the triangles with a single cross-vein. There are three cell-rows in the discoidal field. In the hindwing usually four cell-rows present between the anal loop and wing margin. Pterostigma long, 4 mm, and coloured black. Nodal-index in one example: 9: 17:: 17: 10/12: 11:: 12: 11.

Abdomen long, parallel sided, three basal segments provided with lateral yellowish markings (Fig. 34), in the 4th segment no lateral stripe present excepting a small lateral spot which is connected with a very narrow ring at the extreme base. Similar basal circle is present up to 7th segment, respectively, but often disappearing in distal segments. There is a very narrow yellowish middorsal ridge through 3–7 or 3–8 segments, usually interrupted at the segment end. Distally 8–10 segments are all dull black (Fig. 35).

Caudal appendages are as shown in Figs. 36–37. Accessory genitalia as shown in Fig. 38. These genitalic structures do not seem to afford any good point for subspecific differentiation.

♀ (ad.): Abd.+app. 45–47 mm, hindwing 51–54 mm.

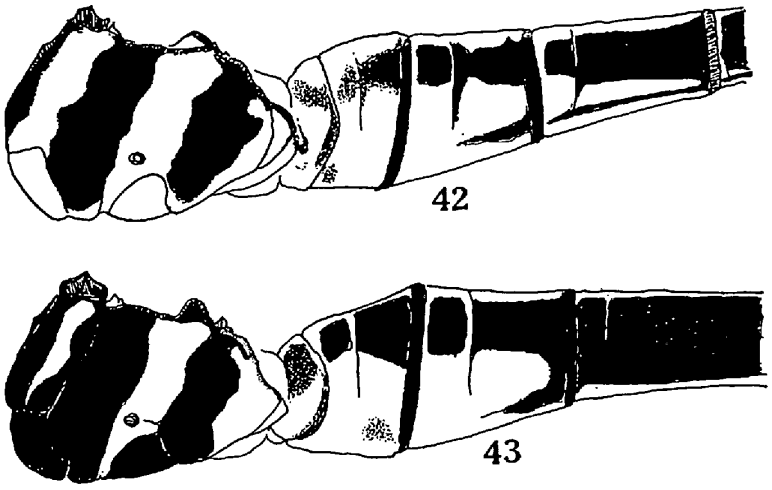


Figs. 34–41. *Zygonyx iris insignis* (KIRBY), Hong Kong; 34, ♂ markings of pterothorax and basal abdominal segments, lateral; 35, ♂ abdominal pattern, dorsal; 36, 37, ♂ caudal appendages; 38, ♂ accessory genitalia; 39, ♀ abdominal pattern, dorsal; 40, 41, ♀ valvula vulvae, ventral.

Head coloured as that of teneral male insect, not extensively darkened on labrum and clypeus. Pterothorax striped as shown in Fig. 42. Legs pale brownish at the basal part of femora. Wings slightly more broadened than those of the male, and palely smoked all over, with deep brownish basal tint usually up to the arculus or more distally. Wing apices deeply smoked distal to the pterostigma in aged females, often with smoky stripe along the Sc and R_1 veins.

Abdomen coloured as shown in Fig. 39, teneral females show broader yellow markings. Valvula vulvae is difficult to examine as it is covered with folded abdominal tergites. Figure 40 is drawn on one aged female, and Fig. 41 on one teneral female. In the latter figure the site of valvula vulvae is much advanced!

Remarks. While sorting out our material, I found two remarkable specimens with extensively orange-tinted wings. These are very much dark-coloured mature insects: 1 ♀, Lam Tsuen Valley, Hong Kong, 30. V. 1965, leg. S. ASAHINA; 1 ♀, Plains near Foochow, Fukien Province, 1929?, C. R. KELLOGG. These females



Figs. 42–43. *Zygonyx iris insignis* and an undeterminable female, Hong Kong; 42, normal markings of pterothorax and basal abdominal segments; 43, the same of an undeterminable female.

look very different from typical *Z. iris insignis* in the following respects:

1. Labium entirely black in the Hong Kong specimen; or orange spotted in the Foochow specimen.

2. Labrum entirely black as that of the male of typical *insignis*. Postclypeus entirely black in the Hong Kong specimen, dark margined in the Foochow specimen.

3. The antehumeral yellow stripe is very narrow, well outlined, and not obscured by aging, and both infraepisterna darkened entirely (Fig. 43).

4. Wings extensively orange yellow tinted in the basal one-fourth, distal to the level of triangles. In the Hong Kong female the basal two cell-length in *c* and *sc* are deeply browned. Wing apices are deep brownish coloured distal to the pterostigma in forewings, less browned in hindwings. Hindwing length: 50 mm (Hong Kong) and 52 mm (Foochow).

5. Abdomen strongly tinted with bronze green, the basal three segments are illustrated in Fig. 43. It is remarkable that the pattern of the fourth segment is entirely different from that of normal *insignis*. The middorsal ridge is only very narrowly yellowish marked down to fifth segment, then all bronze black.

6. The valvula vulvae was examined on the Hong Kong female, which gives no particular feature different from that of typical ones.

Since we have no male specimen corresponding to these females, I will leave them unnamed for the present.

34. *Rhyothemis variegata arria* (DRURY)

ASAHINA, 1965, p. 504, "1 ♂ 1 ♀, Hong Lok Yuan, 23. VII. 1964."

Additional material taken. 1 ♂, Mai Po Marsh, 23. VI. 1987, leg. K. MATSUKI.

35. *Rhyothemis triangularis* KIRBY

Material examined. 1 ♂, Sam A Chung, 20. VI. 1987, leg. S. ASAHINA. This is a new addition to the Hong Kong fauna.

36. *Zyxomma petiolatum* RAMBUR

ASAHINA, 1965, p. 504, "1 exuviae, Castle Peak Station, 23. VII. 1964."

37. *Tramea virginia* (RAMBUR)

Tramea virginia: RIS, 1916, p. 77, "3 ♀, Hong Kong (26. VIII. 1914, Dr. L. MARTIN)." —— ASAHINA, 1965, p. 504, "1 ♂ 1 ♀, Pak Ngnau Shek, 24. VII. 1964, 2 ♂ 1 ♀, Pokfulum Reservoir, 31. X. 1958, leg. THORNTON,"

Additional material taken. 1 ♂, Mai Po Marsh, 23. VI. 1987, leg. S. ASAHINA.

38. *Pantala flavescens* (FABRICIUS)

ASAHINA, 1965, pp. 504–505.

This is a common tropical migratory insect.

Appendices

1. *Pseudothemis zonata* (BURMEISTER)
   One male was observed flying at Tai Po Kau, 17 & 22. VI. 1987.
2. *Macromia* (?) sp.
   One immature larva was taken in Tai Po Kau Forest, 17. VI. 1987, by ASAHINA.

References

ASAHINA, S., 1965. The Odonata of Hong Kong. *Kontyû, Tokyo*, **33**: 493–506.

———— 1966, Taiwanese Odonata taken by 1965 field works. *Ibid.*, **34**: 105–121.

———— 1986. A list of the Odonata recorded from Thailand, Part XV. Aeschnidae. *Tombo*, **19**: 71–106.

BRAUER, F., 1866. Reise der oesterreichische Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859. Zoologischer Theil, 2 Bd., Neuropteren, 1–104, 2 Tafn. Wien.

CHAO, Hsiu-fu, 1954. Classification of Chinese dragonflies of the family Gomphidae (Odonata). I, III. *Acta ent. sin.*, **3**: 375–434; **4**: 213–275.

FRASER, F. C., 1942. Notes on the genus *Heliogomphus* LAIDLAW, with descriptions of two new species (Odonata). *Trans. r. ent. Soc. London*, **92**: 333–341, 1 pl.

KIRBY, W. F., 1900. On a small collection of Odonata (dragonflies) from Hainan, collected by the late John WHITEHEAD, *Annls. Mag. nat. Hist.*, (VII), **5**: 530–539, 1 pl.

KLOTS, E. B., 1947. Chinese dragonflies (Odonata) in the American Museum of Natural History. *Amer. Mus. Novit.*, (1341): 1–15.

LAIDLAW, F. F., 1925. Two new species of dragonflies (Odonata) from the Philippine Islands, with remarks on the genus *Heliogomphus*. *Philip. J. Sci.*, **28**: 559–565.

LIEFTINCK, M. A., 1948 a. Descriptions and records south-east Asiatic Odonata. *Treubia*, **19**: 221–278.

LIEFTINCK, M. A., 1948 b. Entomological results from the Swedish Expedition 1934 to Burma and British India. *Ark. Zool.*, **41A** (10): 1–23.
MARTIN, R., 1906. Coll. Zool. Selys-Longchamps, Fasc. 17, Cordulines. 94 pp., 3 pls.
NEEDHAM, J. G., 1930. A manual of the dragonflies of China. *Zool. sin.*, **11**(1): 344+11 pp., 20 pls.
RIS, F., 1909–'16. Coll. Zool. Selys-Longchamps, Fasc. 1–16b, Libellulinen. Bruxelles.
——— 1912. Neue Libellen von Formosa, Südchina, Tonkin und den Philippinen. *Suppl. ent.*, **1**: 44–85, 3 pls.
——— 1916. H. SAUTER's Formosa Ausbeute, Odonata, mit Notizen über andere ostasiatische Odonaten. *Ibid.*, **5**: 1–81, 3 pls.

Kontyû, Tokyo, **56**(4): 705. December 25, 1988

復刊雑誌紹介

The Entomologist, Vol. 107, No. 1, July 1988. [A Journal of the Royal Entomological Society of London.] 国外購読料 £18.50.

英国で，Monthly Magazine と並んで，1840 年から 1973 年まで刊行されていた小判のポピュラー誌 Entomologist が廃刊 (?) になって大分久しいが，このタイトルを引きついで，本年 7 月からクォータリーで，その第 107 巻が，ロンドン昆虫学会から発行されることになった．

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編集主任は Rothamsted Experimental Station の H. D. LOXDALE 氏で，10 名の編集陣が加わり，事務はロンドン昆虫学会の事務長 G. G. BENTLEY 氏が引き受けているので，同氏宛てに申し込めばよいらしい．

(朝比奈正二郎)