

NEW AND LITTLE KNOWN DRAGONFLIES
FROM THE RYUKYUS (Odonata)

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During my Ryukyu survey in 1962 I obtained a number of new or undescribed dragonflies together with several unrecorded ones from Okinawa and Ishigaki Islands. There were, besides, two interesting species of the genus *Macromia* which will be described in a separate paper.

1. *Rhipidolestes aculeata aculeata* Ris

Coll. Asahina: 1♂3♀ Karayama, Ishigaki, 11.vi.1962, leg. Asahina; 2♂ Omoto-dake, Ishigaki, 17.vi.1962, leg. Asahina.

These are found in small numbers only around the cliff of the waterfalls in deep mountains. In Ryukyu Islands the damselflies of the genus *Rhipidolestes* are known from Yakushima (*Rh. aculeata yakusimensis* Asahina, 1951), Amami-Oshima (*Rh. okinawana* Asahina, 1962) and Okinawa (*Rh. okinawana* Asahina, 1949), but never from Yayeyama group which comprises Ishigaki, Iriomote and Yonakuni Islands. The present specimens are rather small in size (hindwing: ♂ 26-27, ♀ 22-24.5 mm) but are almost identical with the specimens taken in the lowland of Formosa. Although an analytic revision of the species of the genus *Rhipidolestes* occurring in Japan, Ryukyus and Taiwan area is being needed the present Ishigaki specimens are possibly referred to the nominate subspecies, which fact may be interesting from the geographical situation of Ishigaki Island. Noteworthy characters of these mature specimens are: 1. Thorax extensively dark with diminished yellow stripes, 2. The abdominal yellow rings are, on the contrary, always broad and distinct in both sexes, 3. Metapoststernum entirely black.

2. *Bayadera brevicauda ishigakiana* subsp. nov.

Coll. Asahina: 5♂ Omoto-dake, Ishigaki, 14.iv.1962; 12♂11♀ Do., 17.iv.1962, all leg. Asahina.

Bayadera brevicauda Fraser is the sole representative of the genus in Formosa. The present Ishigaki specimens represent a small-sized insular form of this species and is the first record of *Bayadera* in the Ryukyus. The present new subspecies differs from the nominate one: 1. Body-size consistently small, hindwing ♂ 23-25, ♀ 22-24; abdomen ♂ 27-29, ♀ 23-25, while, in the nominate subspecies, hindwing ♂ 28-32, ♀ 28-33, abdomen ♂ 30-37, ♀ 26-33, respectively, 2. Yellow markings of the body extremely reduced: ♂ body almost mat black, in a teneral specimen a dull yellowish v-shaped stripe on the metapleuron recognizable and the abdomen entirely black; ♀ in addition to the v-shaped metapleural marking a vestige of the

lower part of yellow humeral stripe present; abdomen entirely black excepting yellow lateral stripe on 1 and 2 abdominal segments.

Holotype ♂ (No. 5) Omoto-dake, Ishigaki Island, 14. vi. 1962.

Allotype ♀ (No. 25) The same, 17. vi. 1962.

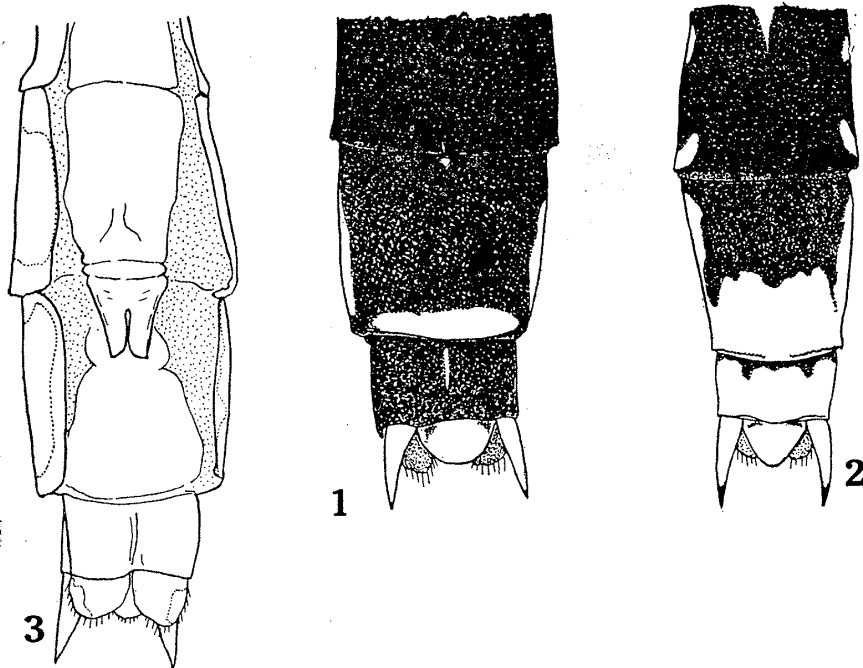
Paratypes 16♂9♀ Omoto-dake, Ishigaki Island, 14. vi. (4♂), 17. vi. 1962. (12♂9♀).

3. *Gomphus amamiensis okinawanus* subsp. nov.

Coll. Asahina: 1♀ Nago, Okinawa, 27. iv. 1962, leg. K. Kubo (Paratype); 1♀ Yona, Okinawa, 30. v. 1962, leg. Asahina (holotype).

I have recently named a *melaenops*-like *Gomphus* endemic to Amami-Oshima as *Gomphus amamiensis* (1962). The present two female specimens from the northern mountain region of Okinawa Island is very closely allied to it, but may represent a distinct geographical race of it. The distinguishing points are:

1. The 10th abdominal segment almost black. (In *amamiensis amamiensis* the dorsal side of this segment entirely yellow.) (Fig. 1, 2)
2. The black of 9th segment much more developed, there are only a distal transverse and lateral marginal stripes. (Fig. 1, 2)
3. Valvula vulvae is of similar shape to nominate subspecies, but entirely black instead of brown-shaded, and comparatively deeply divided. (Fig. 3)
4. In the forewing triangle the costal side distinctly longer (more than 1.5 times) than the proximal side, while it is only slightly longer (less than 1.5 times)



Figs. 1-3. 1, *Gomphus amamiensis okinawanus* ♀ holotype, abdominal end, dorsal view. 2, *Gomphus amamiensis amamiensis* ♀, do. 3, *Gomphus amamiensis okinawanus* ♀ holotype, abdominal end, ventral view.

than the proximal side in *amamiensis amamiensis*.

This dragonfly was first discovered by Mr. Kubo at a stream near Nago. I captured only one mature female specimen and several supposed larvae at a stream of Yona in the north of the island. As this species was named in the absence of the male insect its discovery is being extremely desired.

4. *Gomphus yayeyamensis* Oguma

Gomphus yayeyamensis Oguma, 1926, p. 94, ♀ "Riukiu (Yayeyama, Kuroiwa)".

Gomphus yayeyamensis Asahina, 1957, Shin-Konchu, 10 (4), p. 59 (Ishigaki).

Gomphus yayeyamensis Asahina, 1961, Ins. Mats., 24, p. 59 (Lectotype designation).

Coll. Asahina: 1♂1♀ Ishigaki-jima, 15. v. (♂), 25. vi. (♀) 1926, ex coll. Kagoshima Univ.; 1♂1♀ Ishigaki, 14. iv. 1962, leg. K. Kubo; 4♂2♀ Balbido, Ishigaki, 6. vi. 1962, 3♂1♀ Ditto, 7. vi. 1962 (1♂ Allotypè!); 1♀ Omoto-dake, Ishigaki, 14. vi. 1962; 1♂ Balbido, Ishigaki, 16. vi. 1962, all leg. Asahina.

Being described by Oguma (1926) only by the female insect the unknown male insect and supplementary note of females will be described as below.

♂(ad.): Body length ca. 57 mm, abd.+app. 43, hindwing 35, pt. 3.0 (fw.), 3.5 (hw.).

A representative of the "*melaenops* group" and most closely allied to *G. amamiensis* Asahina (1962) of Amami-Oshima, and to *G. cuneatus* Needham (Chekiang, Central China). Body black with yellow markings.

Head black, only the transverse stripe on the frons and the external side of mandible yellow, usually a pair of very small yellow spots present on labrum. On the postfrons internally to the lateral ocelli a pair of swollen ridges recognizable; posterior occipital edge straight and fringed with long black hairs.

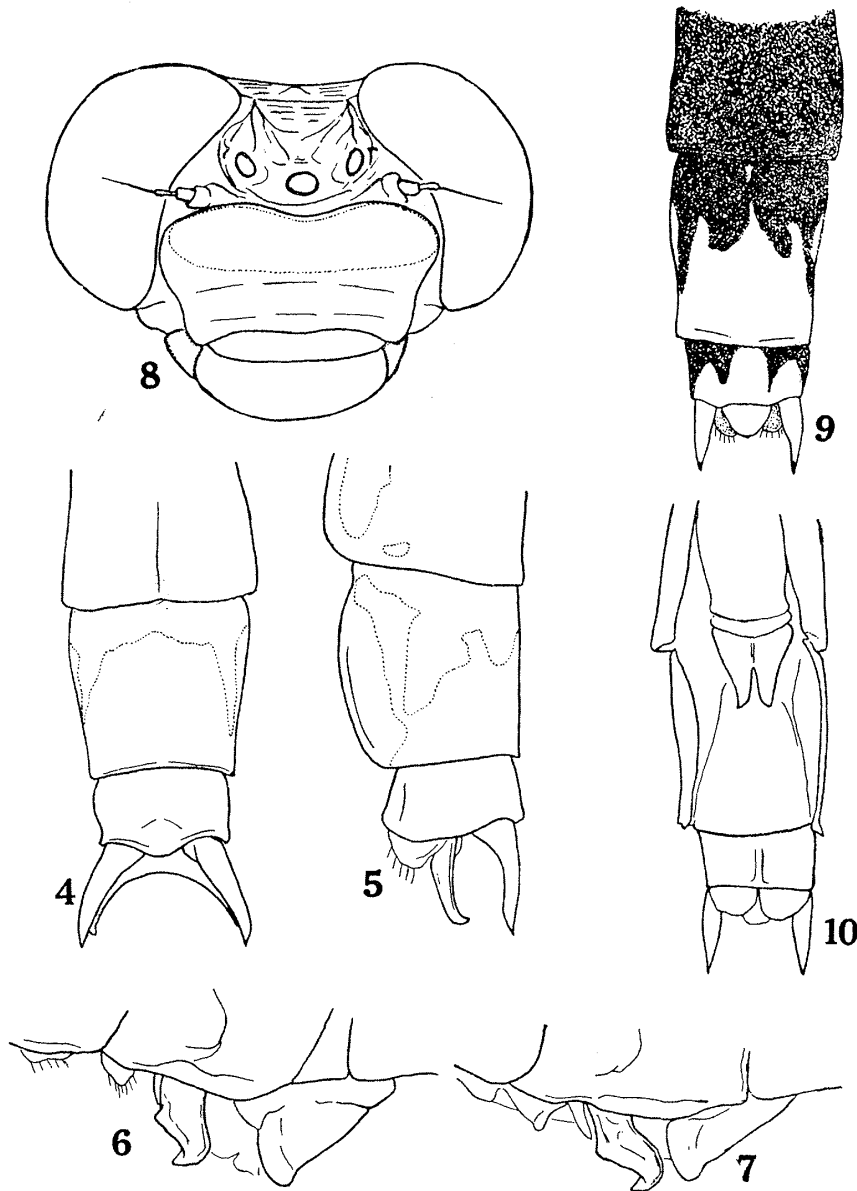
Prothoracic dorsum with small median and large lateral yellow spots; pterothorax black in front with a 7-shaped anterior stripe but the antehumeral stripe entirely absent, sometimes a minute yellow spot remaining just below antealar ridge. Sides of pterothorax broadly yellow with the vestiges of the first lateral black stripe both from above and below, second lateral stripe complete but very narrow; mesinfraepisternum with large spot, metinfraepisternum almost entirely black. Legs wholly black.

Wings hyaline, enfumed in aged insects; pterostigma brownish black; the forewing triangle with the costal side only slightly longer than the internal side. Antenodal index 15-18/12-13.

Abdomen slender, only slightly crubbed at 7-9 segment; segments 1 and 2 with narrow middorsal and broad lateral yellow stripes, auricles yellow, segment 3 with a triangular basal and a lateral spots; 4-7 each with distinct basal yellow ring which has slightly pointed projection on the middorsal line; segment 8 with a small basal triangle and a lateral oblong spot accompanying a minute spot near distal edge; segment 9 with a large yellow marking on the distal half as shown by the figure (Figs. 4, 5); segment 10 and caudal appendages entirely black, the latter are of very simple feature.

Accessory genitalia as shown in Figs. 6 and 7, the hamulus posterioris angulated at the middle on the anterior side, the apex recurved almost at right angle.

♀ (ad.): Body ca. 57, hindwing 38-39, abdomen 44-46, pt. 4 (fw.) 4.5 (hw.). Similarly coloured as the male. Labrum entirely black. A low spinal process present behind each the lateral ocellus directed backwards; posterior border of the occiput straight, with a faint swelling at the middle (Fig. 8). Thorax similarly coloured as the male, legs armed as the male but the spines of the hind femur stronger. Abdo-



Figs. 4-10. *Gomphus yayeyamensis* ♂, 4, abdominal end, dorsal view. 5, Do., lateral view. 6, 7, accessory genitalia, lateral view. 8, Do., ♀, head frontal view. 9, Do., ♀, abdominal end, dorsal view. 10, ♀, abdominal end, ventral view.

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men rather thick, slightly swollen basally and again distally, with the yellow markings as shown in the male, but basal annular ones on 4-7 larger and distinct, each occupying about one fifth the segment length; dorsum of 10th segment almost yellow, cercus and the epiproct entirely yellow (Fig. 9). Valvula vulvae black, rather deeply divided as that of *G. amamiensis okinawanus* (Fig. 10).

5. *Polycanthagyna melanictera* Selys

Coll. Asahina: 3♂2♀ 27.v., 1♂1♀ 31.v., 1♂2♀; 1.vi., Yona, 1♀ Gogayama, 2.vi.1962, Okinawa, leg. Asahina.

Until the year 1959 when I captured one male specimen in Amami-Oshima (Asahina, 1962) the southern limit of this dragonfly was Tanegashima Island, South Kyushu. But during my 1962 survey I found, again for the first time from Okinawa Island, rather plenty of the individuals of this species in the northern mountain region.

6. *Anax guttatus* Burmeister

Coll. Asahina: 1♀ Taira, Okinawa, 14.vi.1962, leg. Higashihiraji; 1♂ Karayama, Ishigaki, 8.vi.1962, leg. Asahina; 2♀ Do., 11.vi.1962; 1♂ Yonehara, Ishigaki, 12.vi.1962, leg. Asahina.

This has been known from Takarajima, in the Tokara Group, north of Amami-Oshima, and from Tokunoshima, south of Amami-Oshima as well as from Formosa, but never from Amami-Oshima, Okinawa and Yayeyama Islands. In 1962 Mr. Higashihiraji obtained and presented me one male from Okinawa, and I captured myself 2♂2♀ in Ishigaki Island.

7. *Chlorogomphus brunneus brunneus* Oguma

Chlorogomphus brunneus Oguma, Ins. Mats., 1(2), p. 87, 1926 "Formosa (Uchida)".
Chlorogomphus brunneus Fraser, Mem. Ind. Mus., 9(6), p. 253, 1932 "Formosa".
Chlorogomphus brunneus Chen, Quart. J. Taiwan Mus., 3(3), p. 139, 1950 "Loochoo Is.: Iriomote, 20.vi.1932 (T. Shiraki), 1♂ (Allotype). Kunigami, 21.iv.1932 (J. Sonan), 1♀, Okinawa, vi.1926 (I. Issiki), 1♀".
Chlorogomphus brunneus brunneus Asahina, Shin-Konchu, 10(8), p. 50, 1957 "Okinawa-honto".
Chlorogomphus brunneus brunneus Asahina, Ins. Mats., 24(1), p. 61, 1961 "1♂ Okinawa, Sakaguchi". (Lectotype designation)

During my 1931 expedition to Okinawa I got one male and two females, and later a few material were obtained, but during 1962 expedition further sufficient material of both sexes were captured. The noteworthy characteristics of the male insect which enable this subspecies to be distinguished either from northern *Ch. brunneus costalis* Asahina, or from Formosan *Ch. risi* Chen, may be summarized as follows:

1. In the superior caudal appendage the subapical lateroventral hook, seen from side, somewhat proximal. (In *Ch. b. costalis* this hook is situated almost equally distad to the apical dorsal hook.)
2. Antealar sinus black; the distal margin of the second abdominal segment provided with a pair of transverse fusiform markings. (In *Ch. risi* the antealar sinus yellow, and the distal margin of 2 abdominal segment distinctly yellow interrupted only at the middorsal ridge.)

3. In the superior caudal appendage the apex of the apical hook bluntly cut; the subapical hook situated relatively proximal. (In *Ch. risi* the apical hook ending into a pointed lower hook and the subapical hook situated more distally.)

8. *Hemicordulia mindana* Needham et Gyger

Coll. Asahina: 1♂ Balbido, Ishigaki, 6. vi. 1962, leg. Asahina.

From Ishigaki Island only a male and a female specimens have been recorded (cf. Asahina, 1947), I was fortunate enough to capture the third specimen, one male, there.

9. *Hemicordulia okinawana* Asahina

Hemicordulia okinawana Asahina, Mushi, 17(12), p. 79, 1947 "1♂ Gogayama, 11. v. 1931; 1♂ Isakawa-yama, 13. vi. 1931, 1♂ Do., 14. v. 1931, leg. Asahina; 1♂ Nago-dake, 15. v. 1935, leg. Sunabe".

Hemicordulia okinawana Asahina, Shin-Konchu, 10(12), p. 55, 1957 (Okinawa).

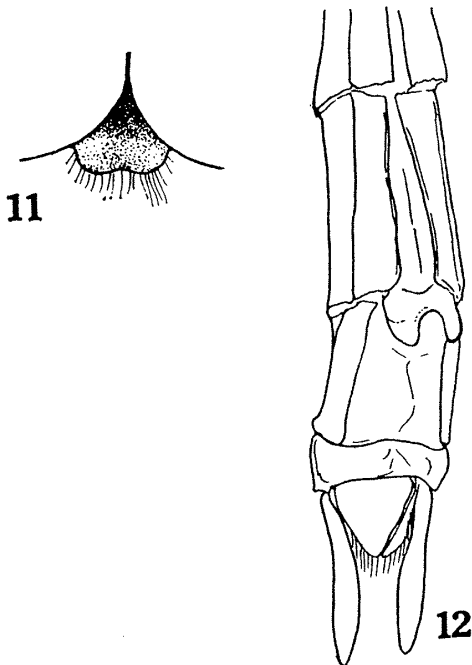
Coll. Asahina: 1♀ Nago-dake, Okinawa, 27. iv. 1962, leg. K. Kubo; 4♂3♀ 27. v., 1♀ 28. v., 2♂2♀ 30. v., 4♂2♀ 31. v., 6♂4♀ 1. vi. 1962, Yona, Okinawa, leg. Asahina; A female (No. 30) in my collection taken at Yona, Okinawa, 1. vi. 1962, was chozen as allotype.

The four male specimens used for original description were all the known material of this species, but in April, 1962, Mr. K. Kubo obtained, for the first time, a female specimen at Nago, Okinawa. During May, 1962, I myself captured a long series of both sexes on the same island. Thus the description of the female insect was made possible.

♀ (ad.): Body length ca. 55 mm, abd. + app. 43 mm, hw. 38 mm, pt. 2 mm. A coloured dark species of this genus.

Head generally olive brown; labium pale brown; labrum and antefrons in front chestnut brown, the former with two basal black spot and the latter broadly metallic green above; postfrons (vertex) raised and metallic green; occipital triangle produced backward into two lobes, brownish but paler on the lobes, fringed with soft hairs (Fig. 11).

Thorax entirely dark metallic green, ventral side pale black; legs black excepting coxae and protrochanters which are brownish. Wings hyaline but usually enfumed pale brownish, or smoky all over; base of the wings especially of the hindwing palely golden yellow, sometimes as far distal as to the arculus; an-



Figs. 11-12. *Hemicordulia okinawana* ♀. 11, occiput, dorsal view. 12, Do., abdominal end, ventral view.

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Abdomen somewhat inflated at segment 2, slightly narrowed at 3, then nearly of same width to the end; abdomen entirely bronze blue, shining 2-3 segments, only distal margin of 2 segment very narrowly yellow. Cercus, seen from dorsal side, about two times as long as the last segment. Valvula vulvae as shown by Fig. 12, black but yellowish on divided lobes.

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These female insects are characterized by the larger size, bilobed occipital triangle devoiding posterolateral bristles, entirely concolorous thoracic pleurites, and wholly bronze abdomen.

10. *Agrionoptera insignis insignis* Rambur

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Coll. Kyushu University: 1 ♀ Ohara, Iriomote Island, 22. xi. 1960, leg. Yasumatsu.

This is the second record of this species from Ryukyus, the first being made 57 years ago! It was a single specimen in Hokkaido University collection being labelled to have been taken in "Yayeyama, viii. 1903" presumably in Ishigaki Island. Oguma (1915 & 1922) recorded very briefly this first specimen as occurring in "Loochoo".

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11. *Orthetrum triangulare melania* Selys

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Coll. Asahina: 1 ♂ Omoto-dake, Ishigaki Island, 17. vi. 1962, leg. Asahina.

It was rather curious that this common Asiatic species has not been recorded from Ishigaki Island. Only one specimen was discovered in a swampy forest of Mt. Omoto-dake.

12. *Zyxomma petiolatum* Brauer

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Coll. Asahina: 1 ♀ Ishigaki, 5. viii. 1961, leg. Kubo; 1 ♀ Balbido, Ishigaki, 6. vi. 1962, 1 ♂ Yonehara, 12. vi. 1962, 1 ♀ Kainan, 16. vi. 1962, 1 ♀ Balbido, Ishigaki, 16. vi. 1962, all leg. Asahina.

New record from Ishigaki Island. In Ryukyus this has hitherto been known from Okinawa Island.

13. *Zyxomma obtusum* Selys

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Coll. Kyushu University: 1 ♂ South Borodino Island, east of Okinawa, 7. viii. 1958, leg. T. Hidaka.

Oguma (1915, 1922) recorded one specimen of this dragonfly from "Ryukyu" (Okinawa), which is a male insect now preserved in Hokkaido Univ. being labelled as "Okinawa VIII. 1902". The present capture is the second one since 56 years!

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摘 要

1962年に沖縄本島及び石垣島に赴いた際に得られた蜻蛉類のうち、数種の新種及び未記録種を記録する。この際に得られたコヤマトンボ属の種については別に報告する。

1. *Rhipidolestes aculeata aculeata* Ris トゲオトンボ 石垣島(琉球未記録).
2. *Bayadera brevicauda ishigakiana* subsp. nov. チビカワトンボ(新称)石垣島(属は琉球未記録).
3. *Gomphus amamiensis okinawanus* subsp. nov. オキナワサナエ(新称)沖縄本島.
4. *Gomphus yayeyamensis* Oguma ヤエヤマサナエ 石垣島(♂未記載).
5. *Polycanthagyna melanictera* Selys ヤブヤンマ 沖縄本島(未記録).
6. *Anax guttatus* Burmeister オオギンヤンマ 沖縄本島及石垣島(未記録).
7. *Chlorogomphus brunneus brunneus* Oguma カラスヤンマ 沖縄本島.
8. *Hemicordulia mindana* Needham et Gyger ミナミトンボ 石垣島(ここより第3頭目の標本).
9. *Hemicordulia okinawana* Asahina リウキウトンボ 沖縄本島(♀未記載).
10. *Agrionoptera insignis insignis* Rambur ホソアカトンボ 西表島(琉球, 第2回目の記録).
11. *Orthetrum triangulare melania* Selys オオシオカラトンボ 石垣島(未記録).
12. *Zyxomma petiolatum* Brauer オオメトンボ 石垣島(未記録).
13. *Zyxomma obtusum* Selys コフキオオメトンボ 南大東島(琉球, 第2回目の記録).