

**THE PLATYSTICTIDAE OF HONG KONG AND GUANGDONG,
WITH DESCRIPTIONS OF A NEW GENUS
AND TWO NEW SPECIES
(ZYGOPTERA)**

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5 taxa are detailed. Sinostictinae subfam. n. and *Sinosticta* gen. n. are established to receive *Drepanosticta ogatai* Matsuki & Saito, 1996. *Protosticta beaumonti* sp. n., from Guangdong and Hong Kong is described (holotype ♂, allotype ♀: Hong Kong, Keung Shan, 22-V-1994; to be deposited at BMNH), *Drepanosticta hongkongensis* sp. n., is described (holotype ♂: Hong Kong, Tai Mo Shan, 15-V-1994; to be deposited at BMNH), and compared with *D. brownelli* (Tinkham) from Guangdong.

INTRODUCTION

The tropical zygopteran family Platystictidae TILLYARD & FRASER (1938) is divided into two subfamilies; the Platystictinae TILLYARD & FRASER (1938) and the Palaemnematinae TILLYARD & FRASER (1938). The Platystictinae is comprised of three genera: *Platysticta* SELYS (1860), with two representatives from Sri Lanka and one from India; *Drepanosticta* LAIDLAW (1917), containing numerous representatives from the Oriental region including Micronesia (Palau), Papua New Guinea and the Philippines; and *Protosticta* SELYS (1885), whose members are restricted to the Oriental region from India to Indonesia. Only three platystictid species are presently known from the Chinese region. These comprise *Protosticta kiautai* ZHOU (1986a), described from Zhejiang province; *P. taipokauensis* ASAHINA & DUDGEON (1987) known from Hong Kong and possibly Fujian; and *Drepanosticta brownelli* (TINKHAM, 1938) described from Guangdong and hitherto known from Hong Kong. ASAHINA (1987, p. 16) remarked that the platystictid from Hainan, originally described as the female of the *D. brownelli* by ZHOU (1986b), is another, as yet unnamed, species.

All five species treated are found closely associated with shaded mountain streams or seepages in mature forest or wooded ravines. They are on the wing in southern China during the hot, humid summer months from May to September. Often located in difficult terrain, they are generally cryptically coloured and easily overlooked. Many more species are likely to occur in southern and south-western China.

Drepanosticta ogatai (MATSUKI & SAITO, 1996) has been recently described from Hong Kong. This species, which does not belong to Platystictinae, has been erroneously placed in *Drepanosticta*. Three additional populations of this platystictid have been found in Hong Kong. This is the first Old World platystictid species with primitive wing venation similar to the venation found in the Palaemnematinae subfamily. A new subfamily, Sinostictinae, and a new genus, *Sinosticta*, are erected here to receive it. In addition, a new *Protosticta* species, found in Guangdong and Hong Kong, is described. An examination of *Drepanosticta brownelli* material from Guangdong reveals that Hong Kong material, previously treated by ASAHINA (1987, p. 15, figs 39-47) as true *D. brownelli*, belongs to a distinct taxa, which is described here as a new species.

SINOSTICTINAE SUBFAM. NOV.

Old World forms with CuP extending beyond the mid-point of the wing. Males with stout, relatively simple caudal appendages. One genus: *Sinosticta*.

SINOSTICTA GEN. NOV.

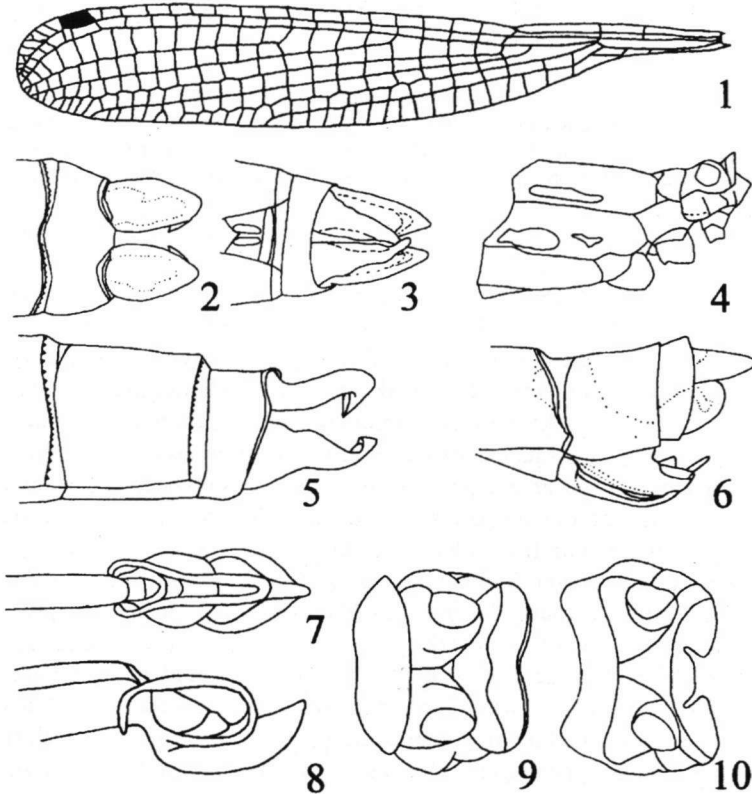
Figure 1

Sinosticta is characterised by CuP extending well beyond the mid-point of the wing; the presence of one or more basal supplementary postcubital cross-veins in addition to the postcubital vein (pcv) and the anal crossing; males with stout, relatively simple, caudal appendages.

The 1A vein of *Sinosticta* is reduced, with the vestigial anal bridge (ab) present, linking the anal crossing (Ac) at the junction of the wing border to the lower margin of the quadrilateral cell (see Fig. 1). IR_2 arises four cells from the junction of R_3 with R_2 as compared with IR_2 arising, typically, two cells from the junction of R_3 with R_1 in *Palaemnema*. The CuP vein of *Sinosticta* extends well beyond the mid-point of the wing. This primitive feature is shared with the Palaemnematinae. A pcv is always present plus, typically two or even as many as four, supplementary postcubital cross-veins, basal to Ac, joining CuP to the border of the wing (1A). Intercalated sectors are present between the costa + subcosta and R_1 distal to the pterostigma in common with many species of *Palaemnema*. The body form is large and extremely robust with stout and relatively simple caudal appendages compared to other platystictid genera (see Figs 2-5).

Type species: *Sinosticta ogatai* (Matsuki & Saito, 1996)

DISCUSSION – The Palaemnematinae contains the single New World genus *Palaemnema* SELYS (1860). The subfamily is characterised by the length of the CuP vein which extends well beyond the mid-point of the posterior border of the wing and the origin of IR₂ and R₃ which arise about midway between the subnodus and the pterostigma. The IR₂ of *Sinosticta* arises closer to the pterostigma than the subnodus but R₃ arises closer to the subnodus. However, R₃ is also closer to the subnodus in some *Palaemnema* species e.g. *P. picicaudata* Kennedy (cf. BRIDGES, 1994: XIII, 47, fig. 397). The superior appendages of *Palaemnema* are spindly, complex structures which are similar to many species of *Drepanosticta* and *Protosticta*. The superior appendages of *Sinosticta* are quite different being stout, broad and relatively simple in structure.



Figures 1-10. *Sinosticta ogatai* Hong Kong: (1) ♂, fore wing; – (2) ♂, caudal appendages, dorsal; – (3) ♂, caudal appendages, ventral; – (4) ♂, synthorax, lateral; – (5) ♂, caudal appendages, lateral; – (6) ♀, caudal appendages, lateral; – (7-8) penile organ; – (9) ♂, prothorax; – (10) ♀, prothorax.

The wings of *Sinosticta* possess a minimum of one basal supplementary postcubital cross-vein in addition to the pcv and anal crossing. TILLYARD & FRASER (1938) regards the presence of the pcv as an extremely archaic feature of the Platystictidae. The presence of supplementary postcubital cross-veins in *Sinosticta* appears to be a unique characteristic amongst the platystictids and indeed amongst the Coenagrionoidea.

SINOSTICTA OGATAI (MATSUKI & SAITO, 1996)

Figures 1-10

Platystictidae sp.: WILSON, 1995: 21, 23, 79-81, 85, "♂, ♀, col. photo., key, Hong Kong".

Drepanosticta ogatai: MATSUKI & SAITO, 1996: 39-43, figs 1-16, "holotype: ♂, Ng Tung Chai (Tai Mo Shan), Hong Kong, 21-V-1994; allotype: ♀, do., 29-IV-1995; 2 ♂, do., 21-V-1995; 1 ♂, 1 ♀, do., 29-IV-1995; 1 ♂, do., 1-V-1995; 2 ♂, 1 ♀, do., 20-V-1995 (all specimens S. Ogata leg.)"

Material.—2 ♂, 1 ♀, Tai Mo Shan (Youth Hostel), Hong Kong, 15-V-1994; —3 ♂, 1 ♀, Tai Mo Shan (Youth Hostel), Hong Kong, 21-V-1994; —9 ♂, 2 ♀, Keung Shan (Lantau), Hong Kong, 28-V-1994; —1 ♂, Ng Tung Chai, Hong Kong, 25-VI-1995; —4 ♂, 4 ♀, Sunset Peak (North), Lantau Island, Hong Kong, 25-V-1996; —2 ♂, Sunset Peak (West), Lantau Island, Hong Kong, 26-V-1996.

Measurements (mm). — ♂ total length 46.5-55, abd. + app. 37-44, hind wing 27-32; ♀ abd. + app. 34.5-40, hind wing 30.0-32.

DESCRIPTION: MATSUKI & SAITO (1996) have provided an excellent description of this species. However an additional description is provided here to accompany the introduction of the Sinostictinae subfamily. — A large robust platystictid, predominantly black with bright blue markings on the prothorax and tip of abdomen.

Male. — Labium blackish brown. Labrum is bright yellow with fine black distal border enlarged into a U-shaped mark centrally. The labrum is markedly protruded. Base of mandibles and anteclypeus bright yellow. Postclypeus and frons black. Vertex black with an oblong pale spot outside of the posterior ocelli. Prothorax (Fig. 9) dark brown with frontal lobe cyan blue and two large cyan blue spots on dorsum of middle section. Synthorax (Fig. 4) dark brown with short, pale white antehumeral stripe and rounded oblong pale blue or white spot on the metepisternum. Legs, pale yellowish white with dark spines and distal tip of femora and knee joint dark brown. Wings hyaline. Fore wing illustrated Figure 1. Abdomen predominantly dark brown. Segments 3-7 with basal pale white ring. Dorsum of segments 8-10 pale cyan blue (creamy blue in young adults). Secondary genitalia, as illustrated, Figures 7-8. Caudal appendages as illustrated in Figures 2-3, and 5. Upper surfaces of superior anal appendages white. Upper surfaces of inferior appendages white with black tips and ventral surfaces dark brown. The superior appendages are stout, broad structures which exceed the length of the tenth abdominal segment. Dorso-

ventrally the superior appendages are flattened with the tip acutely reflexed to form a stout inward and downward directed, sharply pointed hook. The inferior appendages are also stout structures which are gently reflexed apically to form a short, blunt upwardly directed hook.

F e m a l e. – Similar to male. Labrum, mandibles and anteclypeus ivory white. Prothorax (Fig. 10) dark brown with pale frontal lobe and two round pale spots on dorsum of middle section. Two narrow slots present in centre of frontal lobe. Blue markings on abdomen reduced to dorsum of segment 10 and dorsal, posterior half of segment 9. Styles half the length of superior appendage. Superior appendages black. The styles are apparently broken off in Matsuki & Saito's drawing (1996, p. 41, fig. 13). Tip of abdomen illustrated Figure 6.

PROTOSTICTA BEAUMONTI SP. NOV.

Figures 11-16

Protosticta sp.: WILSON, 1995: 21, 23, 78-79, 81, 83, 85, "♂, ♀, col. photo., key, Hong Kong".

M a t e r i a l. – **H o l o t y p e:** ♂, Keung Shan (Lantau), Hong Kong, 22-V-1994. **A l l o t y p e:** ♀, Keung Shan, (Lantau), Hong Kong, 22-V-1994. – **A d d i t i o n a l m a t e r i a l:** 10 ♂, 3 ♀, do., 28-V-1994; – 4 ♂, Dinghu Shan, Guangdong Province, China, 13-VI-1994; – 3 ♂, do., 14-VI-1994; – 2 ♂, Keung Shan (Lantau), Hong Kong, 21-V-1995; – 2 ♂, Dinghu Shan, Guangdong, China, 3-VI-1995; – 3 ♂ 1 ♀, Shek Pik Reservoir (Lantau), 8-VI-1996; – 2 ♂, Tei Tong Tsai (Lantau), 8-VI-1996; – 6 ♂, Big Wave Bay, Hong Kong Island, 20-VI-1996. Holotype and allotype to be deposited at the BMNH.

E t y m o l o g y. – I am pleased to name this damselfly in honour of the late J a c k B e a u m o n t who greatly encouraged my interest in Odonata.

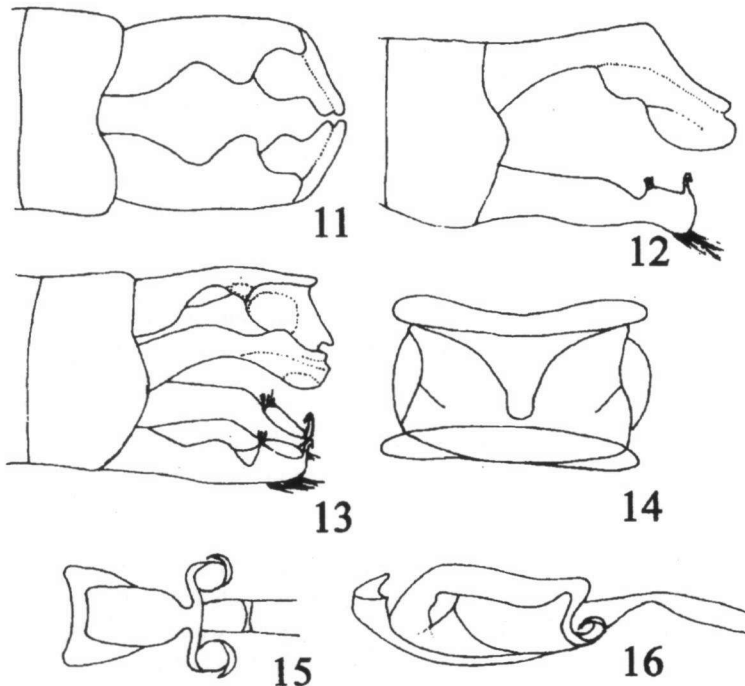
M e a s u r e m e n t s (mm). – ♂ total length 50-51, abd. + app. 44-45, hind wing 22-22.5; ♀ abd. + app. 34-35, hind wing 20-21.

D E S C R I P T I O N. – **M a l e.** – Labium a translucent pale brownish white. Labrum ivory white with distal border finely black. Clypeus ivory white and upper margin of mandibles which are otherwise black. Frons and remainder of head black. Prothorax yellowish white with anterior border of fore lobe smoked dark brown and hind lobe blackish. Legs and coxae yellowish white with fine black ridge at outer face of femora. Dorsum and upper sides of thorax black. Lower half of side of thorax yellowish white with heavy broad smudged blackish marking along metapleural suture. In some specimens the mesepimeron is predominantly blackish with pale white areas reduced to two small spots. Dorsum and upper side of abdominal segments 1-2 dark brown basal half yellowish white. Segments 3-6 dark brown with pale brownish white rings at base and towards distal border at 3/4 length segment. Segment 7 dark brown with pale ring at base only. Segment 8 blackish with pale white triangular spot at side occupying basal half. Segment 9 creamy white finely bordered blackish. Segment 10 and anal appendages black.

Secondary genitalia as illustrated in Figures 15-16. Terminal filaments of penile organ broadened towards tip to form cups. Caudal appendages (Figs 11-13) with inferior appendages, cupped with prominent, curved terminal spine.

F e m a l e. – Similar to male. Prothorax illustrated Figure 14. Body much shorter than male but colouration very similar. Dorsum of abdominal segment 9 blackish brown, rather than white of male, with paler brown markings at side.

DISCUSSION. – *Protosticta beaumonti* is closely allied to *P. curiosa* FRASER (1934) known from Burma and Thailand. The abdomens of the males of both *curiosa* and *beaumonti* are extremely long relative to the short wings, with a ratio of more than 2:1. ASAHINA (1984, pp. 586-588, figs 1-7) describes the male prothorax of *curiosa* as pale brown with pairs of dark spots on the anterior, median and posterior lobes unlike male *beaumonti* which has a yellowish white prothorax with anterior border of fore lobe smoked dark brown and hind lobe blackish. The caudal appendages are complex and broadly similar but the tips of the inferior appendages of *curiosa* lack the stout curved terminal spine of *beaumonti* and are not as markedly cupped (cf. ASAHINA, 1984, p. 587, figs 5-7). Further differences are apparent in the



Figures 11-16. *Protosticta beaumonti* sp. n., Keung Shan, Hong Kong: (11) ♂, superior appendages, dorsal; – (12) ♂, caudal appendages, lateral; – (13) ♂, caudal appendages, dorsal oblique; – (14) ♀, prothorax; – (15-16) ♂, penile organ.

secondary genitalia with *curiosa* lacking the cup-shaped curled tip of the terminal filaments of *beaumonti* (cf. ASAHINA, 1984, p. 587, figs 3-4)

PROTOSTICTA TAIPOKAUENSIS ASAHINA & DUDGEON, 1987

? *Protosticta* sp.: ASAHINA, 1978: 4 & 12, figs 2 & 40, (1 ♂, Foochow, Fujian)

Protosticta taipokauensis: ASAHINA & DUDGEON, 1987: 2-6, figs 1-18 (14 ♂, 9 ♀, 7 larvae, Tai Po Kau, Hong Kong, VI-1987); MATSUKI et al., 1990: 12-13, figs 1, 3-4 (15 ♂, 13 ♀, Tai Po Kau, Hong Kong, 5-V-1989); WILSON, 1995: 21, 23, 76, 79, 81, 83, "♂, col. photo., key, Hong Kong".

Material. – 2 ♂, Hoi Ha, Hong Kong, 3-V-1992; – 1 ♂, Tai Po Kau, Hong Kong, 23-V-1992; – 2 ♂, Mid Levels, Hong Kong, V-1993; – 2 ♂, 1 ♀, Tai Mo Shan, Hong Kong, 15-V-1994; – 4 ♂, 1 ♀, Tai Mo Shan, Hong Kong, 21-V-1994; – 2 ♂, 2 ♀, Ng Tung Chai, Hong Kong, 30-IV-1995; – 1 ♂, 1 ♀, Pat Sin Leng, Hong Kong, 7-V-1995; – 2 ♂, Big Wave Bay, Hong Kong Island, 18-V-1996; – 2 ♂, 1 ♀, Sha Lo Tung, I-VI-1996.

DREPANOSTICTA BROWNELLI (TINKHAM, 1938)

Figures 26-27, 30-31

Drepanosticta brownelli: TINKHAM, 1938: 17-19, figs 1-2 (♂, type loc.: Tai-wa-tsz {Monastery}, 5 mi. NW of Ts'ing-Yuen city {Qingcheng, Guangdong}, 28/29-VII-1935, Chauncey W. Brownelli leg., paratype 1 ♂, do., 28/29-VII-1935; 1 ♂, Loh Fau Shan, Guangzhou, Guangdong, 24-VII-1935).

Material. – 1 ♀, Dinghu Shan, Guangdong, China, 3-VI-1995; – 1 ♂, do., 11-VI-1994; – 2 ♂, do., 16-VI-1994; – 7 ♂, do., 2-VI-1995; – 8 ♂, do., 3-VI-1995. ♂ and ♀ material to be deposited at the BMNH.

Measurements (mm). – ♂ abd. + app. 37.0-42.0, hind wing 24.5-27; – ♀ abd. + app. 35.5, hind wing 24.5.

DESCRIPTION. – **Male.** – TINKHAM (1938, p. 18) provided a full description of the male but did not mention the colour of the distal segments of the abdomen. He described the prothorax as, "shining black with the anterior lobe dull ochreous buff" and the caudal abdominal segments as, "7 black with paler basal fifth and segments 8-10 and the anal appendages black." ASAHINA (1987, p. 15) remarked that Tinkham's figures, which are reproduced here (Figs 26-27), suggest the presence of pale bluish parts and points out that such bluish markings are often darkened by decomposition in many specimens. Observations of live *D. brownelli* at Dinghu Shan, Guangdong, which is near the type locality, confirms the presence of pale anterior lobe of prothorax and white abdominal segments 8-10. In dull light these distal segments are pale white, with an extremely faint hint of pale blue, but under strong light the colour of these segments is greyish white with no trace of blue. The colour of these distal segments is pale grey in specimens treated with acetone and preserved.

The horn-like process of the penile organ (Figs 30-31) is divided into two short projections which are acutely reflexed at almost 90°, shortly after their origin, and have acutely curved tips.

F e m a l e. – Similar to male. Labium dark brown, labrum ivory white with distal border black, anteclypeus ivory white. Rest of head black. Prothorax black with anterior lobe entirely ivory white. Thorax black. Coxae and legs pale cream. Femora with dark tip at tibial joint. Wings clear. Pterostigma black. Abdomen as male with less extensive white markings on distal segments. Only the distal two-thirds of the ninth abdominal segment is white (dark grey in preserved specimen).

DREPANOSTICTA HONGKONGENSIS SP. NOV.

Figures 17-25, 28-29

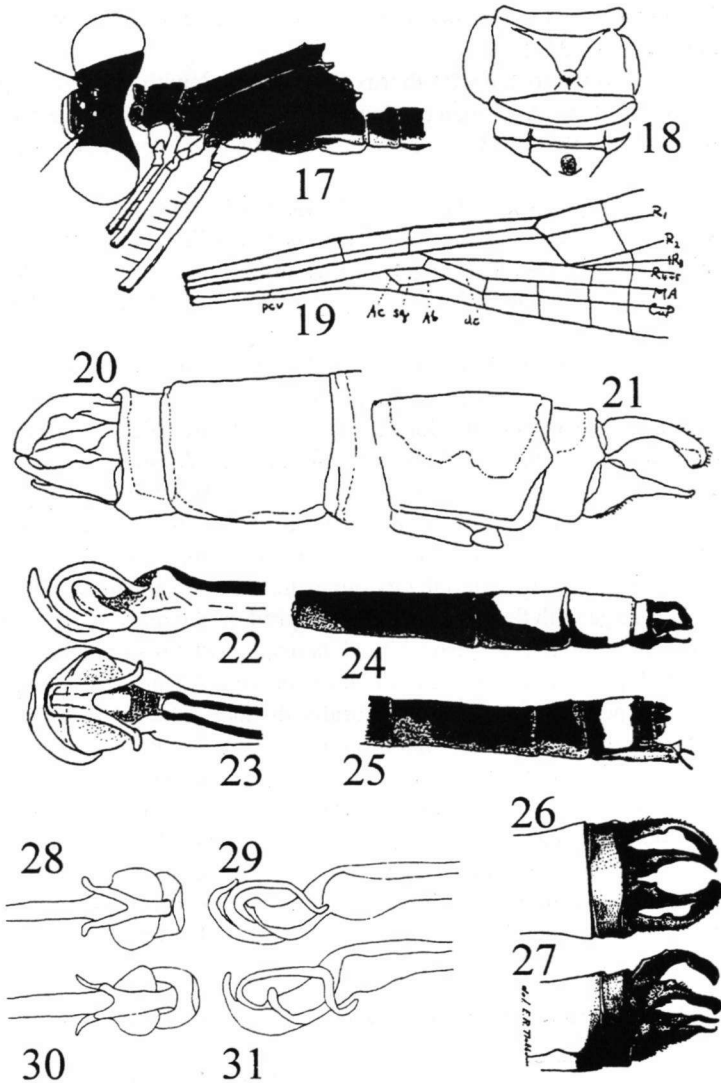
Drepanosticta brownelli: ASAHINA, 1987: 15-16, 22, figs 39-47, 70-71 (5♂, 1♀, Tai Po Kau, Hong Kong, 17-VI-1987; – 2♂, 1♀, do., 22-VI-1987); – MATSUKI et al., 1990: 13, figs 2, 5-6 (1♂, 5♀, Tai Po Kau, Hong Kong, 5-V-1989); – WILSON, 1995: 21, 23, 74, 79, 81, “♂, col. photo., key, Hong Kong”; – MATSUKI & SAITO, 1996: 41-42, fig. 17, “key, Hong Kong”.

M a t e r i a l. – **Holotype:** ♂, Tai Mo Shan, Hong Kong, 15-V-1994. – **Additional material:** 1♀, Tai Mo Shan, Hong Kong, 15-V-1994; – 1♀, Ma On Shan, Hong Kong, 27-VI-1992; – 1♂, Tai Po Kau, Hong Kong, 23-V-1992; – 3♂, Sam A Chung, 30-V-1993; – 3♂, Tai Lam Country Park, Hong Kong, 23-V-1995; – 5♂, Tai Mo Shan, Hong Kong, 21-V-1994; – 6♂, do., 15-V-1995; 2♂, Sha Lo Tung, Hong Kong, 27-V-1995; – 2♂, 2♀, Sunset Peak (Lantau), Hong Kong, 25-V-1996. Holotype to be deposited at the BMNH.

M e a s u r e m e n t s (mm). – ♂ abd. + app. 31-36, hind wing 21-25; – ♀ abd. + app. 26-35, hind wing 20-25.

DESCRIPTION. – A predominantly blackish species with a bright cyan blue dorsal marking at the tip of the abdomen. ASAHINA (1987) fully described and illustrated both male and female material of this taxa from Hong Kong and designated a female as the *D. brownelli* allotype. There is no need to add to Asahina's comprehensive description. ASAHINA's (1987) drawings of the head and thorax, the prothorax, the base of the fore wing, distal abdominal segments and the male secondary genitalia are reproduced here. A brief summary description is provided here.

M a l e. – Labrum ivory white with black distal border. Anteclypeus white. Postclypeus, frons, vertex black. Prothorax and thorax very dark blackish brown. Thorax (Fig. 17) black. Legs and coxae pale creamy yellow. Wings hyaline (Fig. 19). Abdomen dark brown. Bases of segments 3-7 ringed pale whitish yellow. Dorsum of segments 8-10 bright cyan blue with base of segment 8 and lateral borders broadly black. The colour of these distal segments is retained in specimens treated with acetone and preserved. Distal border of segment 10 finely black. Distal segments of abdomen illustrated by ASAHINA (1987), Fig. 24. Caudal appendages



Figures 17-31. [17-25] *Drepanosticta hongkongensis* sp. n., Hong Kong [from ASAHINA, 1987]: (17) ♂, head and thorax; - (18) ♀, prothorax; - (19) base of fore wing; - (20-21) ♂, caudal appendages; - (22-23) penile organ; - (24) ♂, colour pattern of distal abdominal segments; - (25) ♀, colour pattern of distal abdominal segments. - [26-27] *D. brownelli*, Qingcheng, Guangdong [from TINKHAM, 1938]: (26) caudal abdominal segments and caudal appendages, dorsal; - (27) caudal abdominal segments and caudal appendages, lateral; - [28-29] *D. hongkongensis* sp. n., Hong Kong: penile organ. - [30-31] *D. brownelli*, Dinghu Shan, Hong Kong: penile organ.

(Figs 20-21) black. Penis with smoothly curved horn-like processes with slightly angled tips (see Figs 22-23, 28-29).

F e m a l e. – Similar to male. Prothorax (Fig. 18) black with dark brown patches and black anterior lobe. Abdomen predominantly black with bright cyan blue spot on dorsum of distal two-thirds of segment 9 and distal border of segment 8 (see Fig. 25).

DISCUSSION. – *Drepanosticta brownelli* (TINKHAM, 1938) was described from three males; the holotype and one paratype collected at Tai-wa-tsz (Monastery), 5 miles NW of Ts'ing-Yuen City (Qingcheng), Ts'ing-Yuen District, 28/29-VII-1935 and the other paratype collected at Loh Fau Shan, Big Pool (2,800'), 24-VII-1935. The size range given for these males was: total length 45-46.5 mm, abd. 38.5-42 mm, fore wing 27.5-28 mm, hind wing 26.0-27 mm. Tinkham did not mention the colour of the abdomen but his illustrations of the caudal appendages (Figs 26 & 27) indicate that segment 9 and the dorsum of segment 10 are pale. He also described the prothorax as black with frontal lobe dull ochreous buff. Asahina, understandably, assumed the Hong Kong species to be identical with Tinkham's Guangdong *D. brownelli*. Having obtained fresh material of *brownelli* from Dinghu Shan, Guangdong, which is approximately 20 km from Qingcheng the type locality, and compared with Hong Kong material, obvious differences are apparent. Guangdong *D. brownelli* is large with the frontal lobe of the prothorax white and the dorsum of abdominal segments 8-10 is greyish white. *D. hongkongensis* is significantly smaller with an all dark prothorax, and the dorsum of abdominal segments 8-10 is bright cyan blue. The penile organs are structurally distinct. The penile organ of *D. hongkongensis* is divided into two smoothly curved horn-like processes with slightly angled tips whereas these processes in *brownelli* are sharply reflexed, at almost 90°, near the divide, and have acutely curved tips. Females are separated by the colour of abdominal segment 9 which is predominantly white in *brownelli* and predominantly bright cyan blue in *hongkongensis*. In addition the colour of the anterior lobe of the prothorax is bright ivory white in *brownelli* and dark brown in *hongkongensis*. The principle differences are summarised in Table I. All specimens

Table I

Principle differences between *Drepanosticta brownelli* Tinkham and *D. hongkongensis* sp. n.

Feature	<i>brownelli</i>	<i>hongkongensis</i> sp. n.
Size:	♂ abd. + app. 37-42, hind wing 24.5-27; ♀ abd. + app. 35.5, hind wing 24.5	♂ abd. + app. 31-36, hind wing 21-25; ♀ abd. + app. 26-35, hind wing 20-25
Prothorax:	♂ black with pale anterior lobe. ♀ black with ivory white anterior lobe	♂ and ♀ dark blackish brown
Abdomen:	♂ abdominal segments 8-10 greyish white	♂ abdominal segments 8-10 bright cyan blue
Penile organ:	Figs. 30-31. Acutely reflexed (almost 90°) near the divide	Figs. 22-23, 28-29. Divided into two smoothly curved horn-like processes

from Hong Kong previously identified as *D. brownelli* should be recognised as *D. hongkongensis*.

As stated by ASAHINA (1987, p. 16) the platystictid from Hainan, originally described as the female of the *D. brownelli* by ZHOU (1986b) is another, as yet, unnamed species.

ACKNOWLEDGEMENT

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