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MACROMIAS FROM GUANGXI PROVINCE, CHINA, WITH THE DESCRIPTION OF *M. FULGIDIFRONS* SPEC. NOV. (ANISOPTERA: CORDULIIDAE)

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M. fulgidifrons sp. n. is described from Guangxi (holotype ♂, Shi Wan Da Shan, Guangxi, 10-V-1997). The ♀ of *M. hamifera* Lieftinck is described for the first time. *M. moorei malayana* Laidlaw and *M. hamifera* Lieftinck are newly recorded from Guangxi.

INTRODUCTION

Ten specimens attributable to three *Macromia* species were captured at Shi Wan Da Shan, Guangxi in May 1997. The specimens were either caught by myself or by Graham Reels. Of these, two males and one female belong to an undescribed species, two males and two females to *M. hamifera* Lieftinck and three males to *M. moorei malayana* Laidlaw. The new species is described here and the female of *hamifera,* which was hitherto unknown, is also described. A small fourth species, probably *M. urania* Ris, was observed at Shi Wan Da Shan, but not captured. Previously only *M. urania* and *M. berlandi* have been recorded from Guangxi (ZHOU et al., 1994). The number of *Macromia* species now recorded from China totals fifteen. The Chinese species and their distributions are listed in Table I.

MACROMIA FULGIDIFRONS SP. NOV.

Figures 1-5

M a t e r i a l. — **Holotype** ♂: Shi Wan Da Shan, 10-V-1997, coll. K.D.P. Wilson. — **Paratypes**: allotype ♀, ditto, 10-V-1997, G. Reels leg.; 1 ♂, Shi Wan Da Shan, 10-V-1997, coll. K.D.P. Wilson. The holotype and allotype material will be deposited with the BMNH.

E t y m o l o g y. — From the Latin *"fulgidus"* = shining, gleaming, glittering.

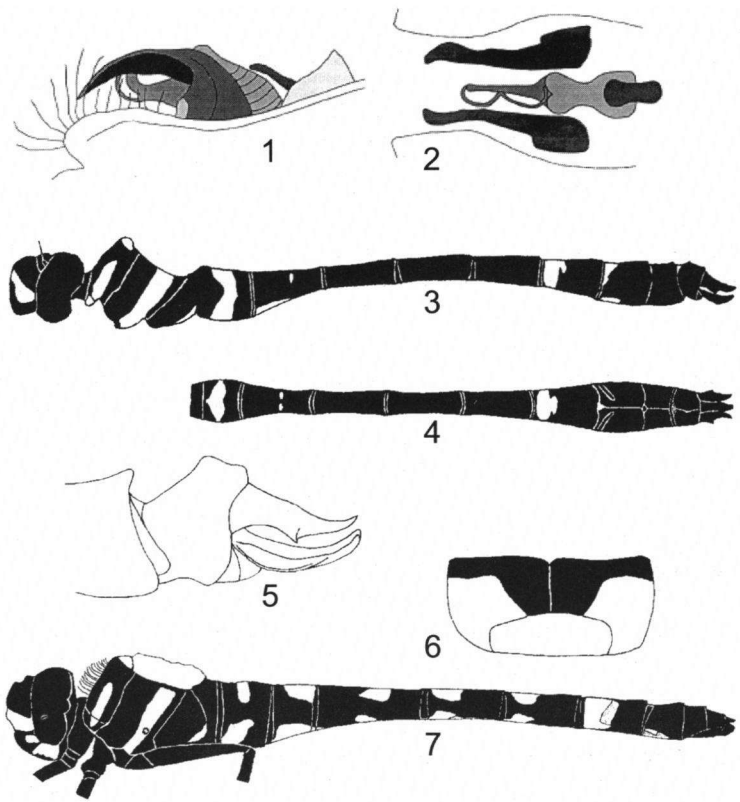
Table I
Macromia species recorded from China

Species	Author	Distribution
M. berlandi	LIEFTINCK, 1941	China (Hong Kong, Guangxi) Vietnam
M. chui	ASAHINA, 1968	China (Taiwan)
M. clio	RIS, 1916	China (Taiwan), Japan
M. flavocolorata	FRASER, 1922	Burma, China (Yunnan), India, Laos, Nepal, Thailand, Vietnam
M. fulgidifrons	sp. nov.	China (Guangxi)
M. hamifera	LIEFTINCK, 1955	China (Fujian, Guangxi)
M. icterica	LIEFTINCK, 1929	China (Guangdong)
M. katae	WILSON, 1993	China (Hong Kong)
M. kiautai	ZHOU et al., 1994	China (Yunnan)
M. malleifera	LIEFTINCK, 1955	China (Fujian, Zhejiang)
M. macula	ZHOU et al., 1994	China (Zhejiang)
M. manchurica	ASAHINA, 1964	China (Heilongjiang)
M. moorei malayana	LAIDLAW, 1928	Burma, China (Sichuan, Guangxi), India, P. Malaysia, Thailand, Vietnam
M. urania	RIS, 1916	China (Hong Kong, Guangdong, Guangxi, Taiwan, Zhejiang), Japan, Vietnam
M. yunnanensis	ZHOU et al., 1993	China (Yunnan)

MALE (Figs 1-5). — A relatively small *Macromia* with sparsely marked blackish abdomen. Labium creamy brown. Labrum, anteclypeus, mandibles black. Postclypeus bright yellow. Frons black at sides with anterior face bordered black at base. Anterior surfaces of frons heavily pitted and coloured bright metallic green. Upper surfaces of frons comparatively smooth with brilliant metallic green reflections. The strength of colour of the upper frons is stronger and brighter than is typical in Chinese macromias. Vertex is dull metallic green with barely discernible twin peaks. Thorax matt black with faint metallic green highlights (Fig. 3). Antealar sinus yellow. Antehumeral stripe bright yellow falling short of the wing bases by one quarter of the length of the mesepisternum and continuing onto the mesokatepisternum. Coxae black. Fore-leg with half of tibia keeled and hind leg with tibia keeled along the entire length apart from basal 1/6th. Middle leg with no trace of keel. Abdomen predominantly black with poorly developed yellow colouration (Figs. 3-4). Segments 1, 4-6, 9-10 all black. Basal half of segment 2 with yellow ring covering the auricle. The yellow ring is invaded laterally with a triangular black area basal to the auricle. Base of segment 3 with small yellow spot at lateral ventrum and two small yellow spots at distal margin of dorsum. Base of segment 7 with yellow band extended on dorsum with a smaller yellow spot (Fig 4). Segment 8 with basal yellow spots on dorsum and ventrum. Dorsal carina of segment 10 strongly angled and keeled (Fig. 5). Posterior hamulus elongate and obliquely flattened, when viewed laterally, with tip slightly reflexed inwards (Figs. 1-2). Penile organ bificated, dorso-ventrally, at tip to form a downward pointing,

perpendicular spike and a long, loose, spiralled tendril (Figs 1-2).

FEMALE. – Single teneral specimen. Apart from head similar to male but with much more extensive yellow markings on the abdomen. Labium pale creamy brown. Labrum, anteclypeus, mandibles black. Postclypeus bright yellow. Base of frons finely bordered yellow which extends onto the ventral half of the sides of the frons. Frons otherwise black with heavy pitting on anterior surface. The two pyramidal peaks of the frons are deeply divided; considerably more so than the male. Vertex as male but black. Occiput black and raised. Thorax as male. Legs black, unkeeled. Abdomen black with well developed yellow pattern. Segment 1 black. Basal half of segment 2 ringed yellow. Segments 3-6 with a pair of yellow spots sited anterior to the mid-dorsal, transverse carina. These spots decrease in size from segment 3 to segment 6. Basal third of segment 7 ringed yellow. Anterior ventral base of seg-



Figs 1-7. [1-5] *Macromia fulgidifrons* sp. n., Shi Wan Da Shan, Guangxi: (1-2) male secondary genitalia; (3) male body, lateral view; (4) male abdomen, dorsal view; (5) male caudal appendages, lateral view. — [6-7] *Macromia hamifera,* Shi Wan Da Shan, Guangxi: (6) female labium; (7) female body, lateral view.

ment 7 and 8 yellow.

Measurements (mm). – Male: abd. + app. 50.5 – 53.0, hw. 46.0 – 48.5; – female: abd. + app. 46.0, hw. 48.0.

DISCUSSION. – The closest Chinese congener to *fulgidifrons* appears to be *M. chui* (cf. ASAHINA, 1968: 94-95, figs 15, 18-22) which also has a dark face with a bright yellow postclypeus, a similarly shaped yellow antehumeral stripe, poorly developed yellow markings on the male abdomen, and an angled, strongly keeled, dorsal carina on the tenth abdominal segment. The posterior hamulus of *chui* is dorso-ventrally broader than *fulgidifrons* and the inferior appendage is proportionally longer. ASAHINA (1968) remarks that *M. chui* is closely allied to the Japanese and Korean *M. daimoji*. I have examined a male specimen of *M. daimoji*, taken from Aichi Prefecture, Japan kindly given to me by K. Ikeda. It is a comparatively larger species with proportionately larger, more robust, posterior hamuli and the transverse yellow stripe of the second abdominal segment is interrupted laterally. This latter feature is also shared with *chui*.

MACROMIA HAMIFERA LIEFTINCK, 1955

Figures 6-7

Macromia hamifera LIEFTINCK, 1955: 253-256, figs 1-4, "1 ♂, type loc.: Kuantun, Fukien Province".

Material. – First ♀: Shi Wan Da Shan, Guangxi, 10-V-1997, coll. K.D.P. Wilson. – Additional material: 1 ♂, 1 ♀, Shi Wan Da Shan, 10-V-1997, coll. K.D.P. Wilson; – 1 ♂, ditto, 10-V-1997, G. Reels, leg. The first ♀ will be deposited with the BMNH.

LIEFTINCK (1955) considered that *hamifera* approached *M. amphigena* most closely in details of colouring, armature of tibiae, and genital organs. The middle tibia of the males of *hamifera* and *amphigena* are keeled along nearly half their length. The lateral yellow markings of the third abdomial segment form a complete ring in *amphigena* but are widely separated in *hamifera*. In addition the second abdominal segment has a complete yellow ring in *amphigena* but this ring is widely interrupted at the mid lateral point in *hamifera*.

FEMALE (Figs 6-7). – Very similar to LIEFTINCK's (1955) description of the male. Median lobe of labium yellow and lateral lobes yellow with anterior border and inner half black (Fig. 6). Mandibles black with yellow spot at base. Labrum and anteclypeus black. Postclypeus bright yellow with lower margin finely black. Face of frons, black, punctate with faint metallic reflections on pyramidal processes. Dorsal surface of frons deeply divided with the surfaces of the pyramidal processes flat and roughly punctate with blue-green metallic reflections. Two small dull yellow circular spots at anterior base of dorsal surface of frons immediately adjacent the central ocelli. Vertex black with two sharply pointed tubercles. Occiput glossy black and markedly raised. Back of head glossy black. Thorax large, matt

black, hirsute, with faint isolated, metallic blue-green reflections (Fig. 7). Broad yellow antehumeral stripe which falls short of the wing bases by one third of the thoracic metepisternum. The antehumeral stripe extends onto the mesokatepisternum where it is a much paler yellow. Ante-alar sinus yellow. Metepisternum with broad yellow stripe traversing the spiracle. Rear corner of metepimeron finely yellow. Legs black and very long. Posterior femora extend to mid-point of abdominal segment 2. Abdomen very stout, black with large yellow dorsal spots (Fig. 7). Segment 1 black. Segment 2 with yellow transverse spot occupying mid basal quarter of dorsum not extending very far laterally. Basal half of ventrum of segment 2 with large yellow spot, widely separate from dorsal yellow spot. Ventral base of segment 3 with triangular yellow spot which tapers towards a point not quite extending to the transverse suture. This spot is widely separated from a large dorsal triangular yellow spot which tapers towards mid dorsal base of segment. Segments 4-6 with large yellow spots commencing near base of dorsum and extending to the transverse suture. Small ventral spots occupy the corresponding basal latero-ventral margins of segments 4-6. These triangular spots are narrowest basally and widest posteriorly. Segment 7 with transverse yellow ring occupying basal third of segment. Segments 8-10 entirely black.

Measurements (mm). – Male: total length 71.5, abd. + app. 52.0, hw 44.0; – female: total length 76.5, abd. + app. 54.5, hw. 49.0.

MACROMIA MOOREI MALAYANA LAIDLAW, 1928

Macromia m. moorei: ASAHINA, 1978: 246, figs 27-30, "1 ♂, Sichuan"; – ZHOU et al., 1994: 155, "1 ♂, Sichuan".

Material. – 3 ♂. Shi Wan Da Shan, 10-V-1997, coll. K.D.P. Wilson.

ASAHINA (1987: 358-361, figs 18-20) discussed the diagnostic characters of the three described subspecies of *M. moorei*. These include *m. moorei* Selys (Darjeeling, Nepal, Kumaon), *moorei fumata* Krueger (Java) and *moorei malayana* Laidlaw (Assam, Burma, Thailand, Malaya, Sichuan). ASAHINA (1996) has recently recorded *m. malayana* from north Vietnam. The entire upper surface of the frons is metallic green in *m. malayana*. The groove separating the flat surfaces of the upper frons is yellowish, or occasionally with metallic spot in *m. moorei* and the top of the frons has a bluish reflection in *m. fumata*. The upper frons of the Guangxi specimens are entirely metallic green. The Chinese *m. malayana* are much larger than Malay specimens. ASAHINA (1987) tentatively reidentified his Sichuan *moorei* specimen, originally identified as *m. moorei* in ASAHINA (1978), as *m. malayana*.

Measurements (mm). – Male:- abd. + app. 54 - 55.5, hw. 47.0 - 48.

BIOLOGICAL NOTES. – The main rivers at Shi Wan Da Shan are broad, swift and shallow. The width varies from approximately 10-20 metres with the rivers domi-

nated by cobble strewn riffles. Males of *M. hamifera* regularly patrolled these broad rivers throughout the day with females appearing in the late afternoon to oviposit. The favoured oviposition sites for *M. hamifera* were relatively slow flowing sections adjacent to emergent, marginal vegetation. Males of *M. m. malayana* were found during the day patrolling slightly smaller tributary streams. *M. fulgidifrons* were found associated with the smallest streams in the area with channel widths of less than 3 metres.

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