

NOTES ON AFRICAN GOMPHIDAE WITH
DESCRIPTIIONS OF FOUR NEW SPECIES AND
A NEW GENUS (Order ODONATA)

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From time to time, new species of Odonata come to me from various places and from various collectors; descriptions of these are made at the time and put aside to be dealt with under their separate families along with any topical notes which may have been jotted down during the same period. The present paper is one of such papers dealing exclusively with species belonging to the family Gomphidae. This family has hitherto been regarded as an archaic one, probably on account of the separated eyes, in which respect they approach the Zygoptera. The persistence of the primary and the non-coinciding secondary-antennodals are further archaic characters, but, apart from these, the absolute atrophy of the endophytic ovipositor and the adoption of an exophytic mode of ovipositing stamps them overwhelmingly as comparatively recent; in this respect they are ahead of the Aeshnidae and on a par with the Cordulegasteridae. In distribution they are essentially a palaearctic and tropical group, becoming increasingly scarce in the neotropics and still more so towards the south of the African continent and Madagascar, only seven species being known from the Cape and only five from the great island of Madagascar; New Guinea can boast of only a single species!

I am indebted to Mr Elliot Pinhey for the present material.

SYSTEMATIC
Family GOMPHIDAE
Subfamily EPIGOMPHINAE

Genus *Nepogomphoides* n.

Nepogomphoides pinheyi n.sp. (Figs. 1a, b, 2a-d)

MATERIAL EXAMINED. Seven males, all from Kimboza Forest, Uluguru Mountains, Tanga Territory, October 1951, E. Pinhey collected.

GENERIC CHARACTERS. Medium-sized, melanotic gomphines closely similar in general appearance to species of *Microgomphus*, and, by the anal appendages, to *Nepogomphus*, but belonging to the subfamily Epigomphinae by the number of cross-veins between the sectors of arculus proximal to the forking of Rs, 3-4 in the forewings, 2-3 in the hind. Anal triangle three- to four-celled, only two rows of cells between this triangle and the discoidal cell; anal-loop absent or formed of a single cell; base of hindwing

sinuous, very oblique but deeply excavated just above tornus; one to two rows of cells in anal field of forewing, four rows in the hind; all triangles entire, venation close; pterostigma large, swollen, strongly braced. Head in proportion to body, frons sharply angulated but with a deep sulcus in the middle. Legs very short and stout, rows of

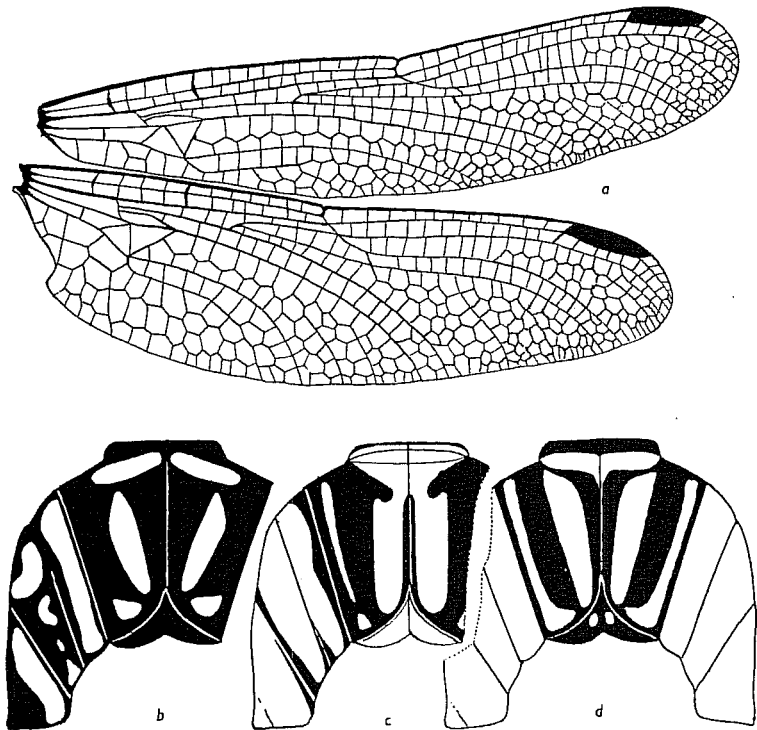


Fig. 1. a, wings of *Nepogomphoides pinheyi* n.sp. Thoracic markings of: b, *Nepogomphoides pinheyi*; c, *Notogomphus flavifrons* n.sp.; d, *Notogomphus butoloensis* n.sp. (diagrammatic).

closely-set, short spines on the femora. Abdomen narrowly cylindrical but dilated at base and more markedly so from apical end of segments 7-10; rudimentary dilatation of the sides of segments 8 and 9. Anal appendages long, curved, forcipate, the inferiors longer than the superiors, which latter possess a unique horn on the dorsum at extreme base. Genotype: *Nepogomphoides pinheyi* n.sp. Its description follows:

MALE. Abdomen with appendages 30 mm. Hindwing 26 mm. Pterostigma 3 mm. (Female unknown.)

Head glossy black with the following markings: two small medial wedge-shaped yellow spots on labrum, the anteclypeus and bases of mandibles of the same colour; frons bluish white on crest, its base above black and connected with the black on front by a fine line in the medial sulcus. Occiput black, its crest shallowly bilobate, raised and emarginate at its middle. Prothorax black with a dorsal citron yellow spot on each side of middle lobe posteriorly. Thorax black marked dorsally with bluish white and laterally with greenish yellow; a slightly interrupted mesothoracic collar well separated from

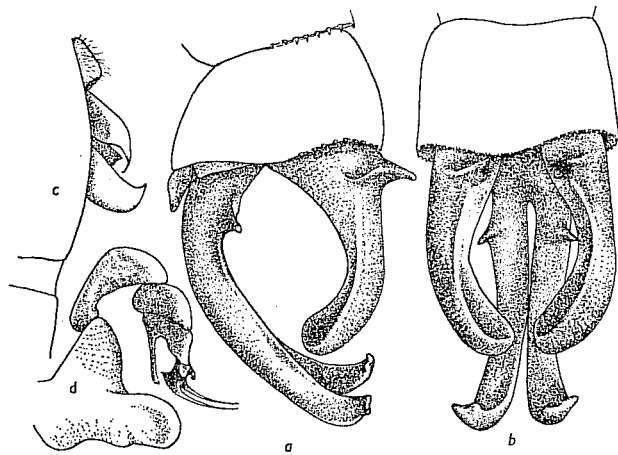


Fig. 2. *Nepogomphoides pinheyi*. a, anal appendages of male seen from the left side. b, dorsal view of same. c, male genitalia. d, penis of same.

narrow oblique divaricate antehumeral stripes which are narrow above but broaden below and are flanked above by a small triangular spot. Laterally a narrow linear posthumeral stripe, a mesepimeral stripe broken up into four spots, a broader, complete stripe on the middle of metepimeron and a small posterior spot bordering the same. Legs black, anterior femora bluish green on the inner side, middle and posterior femora castaneous for their proximal halves. Abdomen black, marked with citron yellow—a triangular spot on each side of segment 1, the oreclites and a narrow middorsal stripe which tapers apically on segment 2, narrow basal annules on segments 3-6, which are confluent with a fine middorsal yellow line, the basal half of segment 7 where the yellow is prolonged on to the apical end of the lateral borders. The rudimentary wings on the sides of segments 8 and 9 and the whole of segment 10 ferruginous. Anal appendages

dark ferruginous, the superiors forcipate, as long as segment 10, broad at base which is surmounted dorsally by a very large robust spine, from the outer base of which runs a ridge hollowed out anteriorly; the appendages triquetral in section with the inner lower surface deeply grooved throughout, the apices, which nearly meet, very obtuse or rounded. Inferior considerably longer than the superiors, deeply fissured into two long branches which are closely apposed except at base and for the apical third, which is curled strongly up in between or behind the apices of superiors and sharply divaricate, the apices truncated and exhibiting two obtuse spines or tubercles. At the base and on the outer side of the dorsal surface of the two branches, shortly posterior to the origin of the fissure, a short stout nipple-like spine directed upwards and somewhat outwards. (These appendages are closely similar to those of *Nepogomphus modestus* (Selys), the chief difference being that the spines of the inferior appendage are at the base instead of subapical. Appendages, genitalia and penis shown in Fig. 2 a-d.

Genus *Paragomphus* Cowley

Paragomphus magnus n.sp. (Fig. 3 a-f)

MATERIAL EXAMINED. A single female from the Shimba Hills, Kenya, December 1950, E. Pinhey collected. (Male unknown.)

FEMALE. Abdomen 40 mm. Hindwing 35 mm. Pterostigma 5-5.5 mm.

Head: labium citron yellow, labrum greenish yellow finely bordered with black and with a basal trilobate black band enclosing a small triangular yellow spot; rest of face and frons greenish yellow with a narrow black transverse line across the upper part of frons connected medially at a point with a broad trilobate black band on the upper surface and at the base of frons; upper surface of rest of head, save the outer angles of occiput, which are yellow, black (Fig. 3 a, b). Prothorax black with a medial geminate spot of greenish yellow on the dorsum of posterior lobe and a small lateral point of the same colour. Thorax black marked with bright citron yellow; a stout slightly interrupted mesothoracic collar which is narrowly separated from rather broad antehumeral stripes which taper to a point below; a large triangular upper spot followed by a narrow linear stripe from which it is just separated and representing a broken humeral stripe. Laterally three broad stripes, the medial one broken up into an upper triangular spot followed by a small oval one and this by a semilunar one just above the trochanter. In addition, there are small trilobate spots in the interalar sinus and on the posterior border of metepimeron. Legs black or dark castaneous on the femora, the anterior pair of which are citron yellow on the inner surface. Wings hyaline, costa, venation and the pterostigma black, the latter covering six cells and braced. Venation close, membrane small, white, nodal index $\frac{10-14}{9-11} \mid \frac{14-9}{11-9}$, 1 Cu_q to all wings, no basal incomplete antenodals present; no defined anal-loop, anal field of five cells in depth with an occasional six. Abdomen black marked with citron yellow; segment 1 with a small median apical point and the sides broadly, segment 2 with a trilobate middorsal stripe, broadest basally and with a broad lateral spot nearly divided in two by an oblique

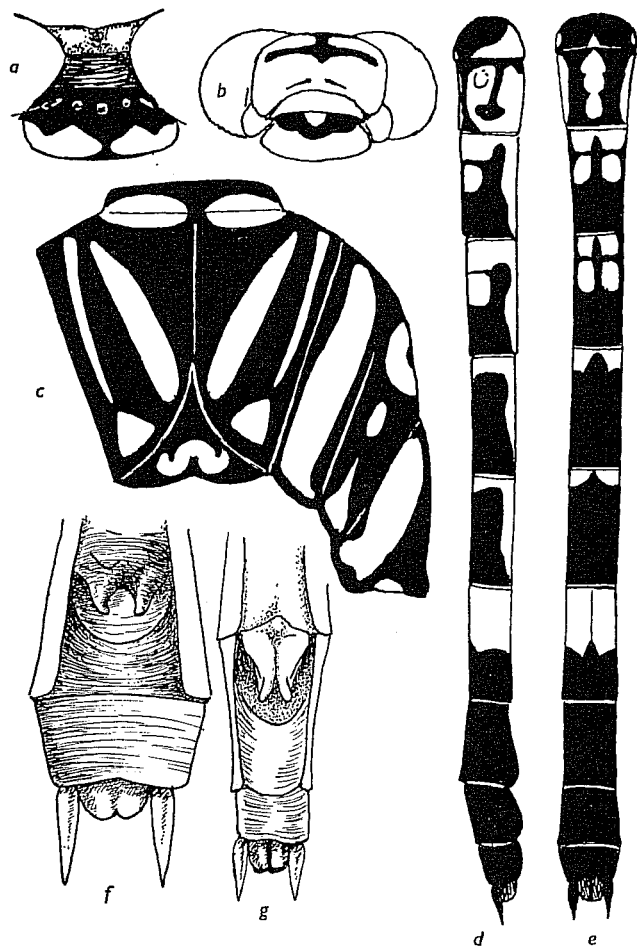


Fig. 3. *Paragomphus magnus* n.sp., female. a, dorsal view of head markings. b, frontal view of same. c, thoracic markings (diagrammatic). d and e, lateral and dorsal views of abdomen. f, ovipositor. g, ovipositor of *Notogomphus butoloensis* n.sp.

linear black streak, segments 3 and 4 with broad basal rings occupying the basal half of the segment but split into four spots by the black middorsal and transverse jugal sutures [viz. the typical tessellated pattern familiar to species of *Paragomphus* and more especially in *lineatus* (Selys)]; segments 5 and 6 with narrow basal rings, deepest on segment 5 and bisected middorsally by the black middorsal suture; segment 7 with its basal three-fifths yellow, the black extending into it for a short distance middorsally. Remaining segments unmarked. Anal appendages and anal pads bright citron yellow, the former shortly conical. Vulvar scales shown in Fig. 3f.

This new species is by far the largest *Paragomphus* so far discovered, and, indeed, the size is so great for the genus that it throws justifiable doubt as to its correct placing; however, the colour pattern and the venational details are absolutely typical of genus *Paragomphus*. Mr Pinhey recently saw what he thought to be the male of this species, flying rapidly down midstream and quite inaccessible. A knowledge of the male will settle all doubt as to the correct determination. *Type* returned to the Coryndon Museum but will probably be lodged in the British Museum.

Notogomphus flavifrons n.sp. (Figs. 1c, 4a, b and e)

MATERIAL EXAMINED. Two males from Mafuga Rain Forest, Kigezi, Uganda, June 1951, 7500–8000 ft., collected T. H. E. Jackson.

MALE. Abdomen with appendages 40 mm. Hindwing 32 mm. Pterostigma 2–2.5 mm. (Female unknown.)

Head: labium with middle lobe black, lateral lobes yellow, labrum glossy black with a citron yellow spot on each side, bases of mandibles, genae, whole of frons anteriorly and above except its base and lastly the occiput above and posteriorly bright yellow. Frons swollen, its crest and outer angles markedly rounded and the median sulcus almost obsolete; occiput raised, sloping somewhat posteriorly, its crest slightly crenate and fringed with black hairs. Prothorax black, the posterior lobe, a geminate spot adjacent to it on the dorsum of middle lobe, an anterior collar and a spot on each side the middle lobe bright yellow. Thorax on dorsum to as far lateral as the line of the humeral suture blackish brown marked with dull grass green; two broad closely apposed parallel stripes along the mid crest of dorsum, constricted below and then fusing with a short complete mesothoracic collar (this marking identical to that in *N. lecythus* Champion); narrow humeral stripes expanding above into a small triangular spot. Laterally broadly olivaceous changing to bright citron yellow ventrally; unmarked save for a slight brownish suffusion along the upper part of the postero-lateral suture. Legs long and spidery, the hind femora extending to the apical end of segment 2 and armed on each side with a row of closely-set small spines and four much longer and more robust ones on the apical third, these gradually decreasing in length towards the distal end. Wings hyaline, venation close, black including the costa; pterostigma very short and stout, braced (quite unlike the elongated pterostigma of *N. praetorius* (Selys)), brownish yellow framed in black veins; nodal index $\frac{13-13}{11-9} \mid \frac{15-12}{10-12}, \frac{12-14}{11-9} \mid \frac{14-10}{9-10}$; an incomplete basal antenodal in all wings; anal-loop of one to two cells; anal triangle

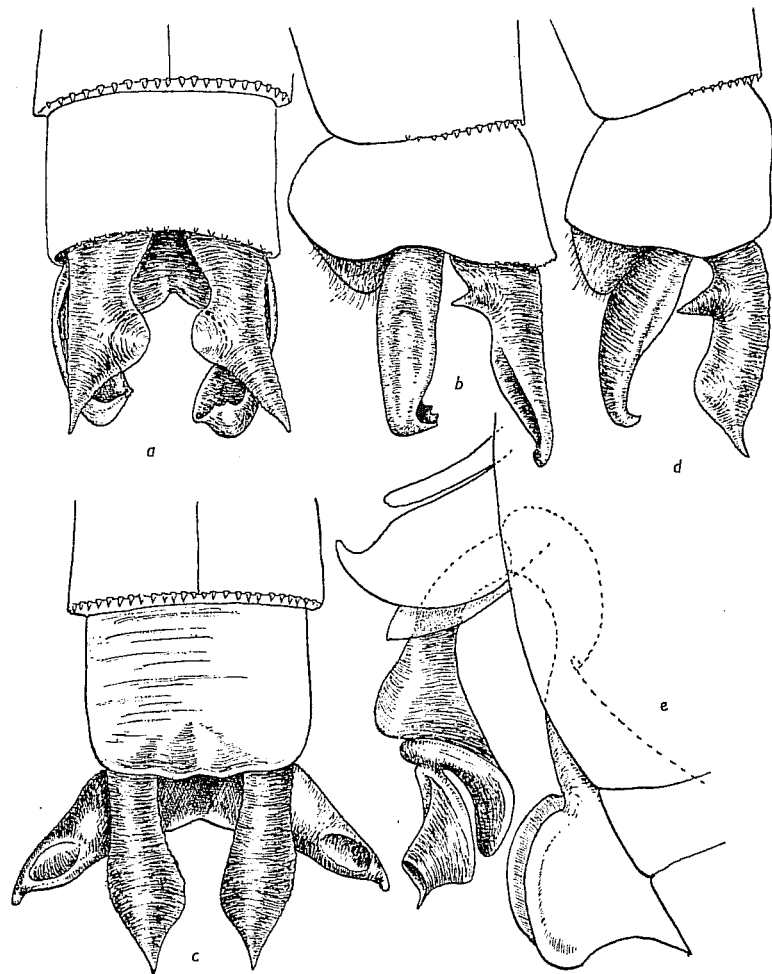


Fig. 4. a and b, dorsal and left lateral views of male anal appendages of *Notogomphus flavifrons* n.sp. c and d, the same of *Notogomphus butoloensis* n.sp. e, male genitalia of *Notogomphus flavifrons* n.sp.

three to four cells (in one male the discoidal triangle has rudiments of cross-veins on basal and distal sides in the left hindwing, whilst in the right hindwing the same cell is divided into two cells by a curved vein running from base to distal side); three cross-veins between the sectors of arculus in forewings but only one in the hind. Abdomen black, cylindrical; segments 7-9 a little dilated but without lateral foliations, marked with yellow as follows: segment 1 with a dorsal and broader lateral spot, segment 2 with a middorsal trilobate stripe, the middle lobe the largest, the oreillets and the sides broadly yellow; segments 3-7 with the middorsal carina finely yellow; segments 8 and 9 laterally and the whole of segment 10 dark ferruginous. Anal appendages black, slightly longer than segment 10, subequal in length, superiors broad and cylindrical at base which is furnished with a robust subbasal ventral spine, after which the appendage expands on the inner side into a broad rounded tubercle and is prolonged conically and obliquely somewhat outwardly into a fine tapered spine. The inferiors, slightly shorter, are not divaricate as in other species of the genus but run nearly parallel with the superiors with a slight convexity outwards and the inner side canaliculated throughout its length; the apex curved over hood-wise and ending in two short teeth. Appendages and genitalia shown in Fig. 4a, b and e.

This new species is easily determined by its non-divaricate inferior anal appendage and by its short stout pterostigma.

Notogomphus butoloensis n.sp. (Figs. 1d, 3g, 4c and d)

MATERIAL EXAMINED. One male, Bwamba Valley, Uganda, 2500 ft., 8 December 1928, collected by A. O. Fisher; two females, Butolo Forest, 30 miles west of Kampala, Uganda, November 1951 and May 1951, collected E. Pinhey.

MALE. Abdomen 38 mm. Hindwing 38 mm. Pterostigma 3-3.5 mm.

Head: labium bright chrome, labrum glossy black with a large citron yellow spot on each side, genae glossy black, clypeus and lower part of frons anteriorly black, crest of latter a fine grass green, vertex and occiput black, the latter raised, convex, its surface finely rugose. Prothorax black, the anterior collar, a geminate spot on middle of posterior lobe and a similar one, on the dorsum of middle lobe, confluent with it, greenish. Thorax dark castaneous on dorsum to as far lateral as a little posterior to the line of the humeral suture, after which it is paler on the sides and probably olivaceous or greenish during life. The dorsum with broad antehumeral stripes beginning above at the alar sinus and broadening downwards, the inner side straight and separated from the middorsal carina by a narrow band of brown, the outer side decidedly oblique and narrowly separated below from a short complete mesothoracic collar which extends somewhat up the middorsal carina. Rather broad humeral stripes which lie close to the suture but curve inwards towards the alar sinus above to almost meet the upper end of the antehumeral stripe. Laterally, apart from the brown-bordering posterior to the humeral suture, there does not appear to be any markings of a dark nature. Legs of great length, the hind femora extending to apical end of segment 2 and furnished with a row of small, closely-set spines on each side but with four to five much longer ones on

the distal half, the penultimate one the longest. The inner row of spines are more widely spaced and rather longer than those of the outer row. Wings hyaline, venation including costa and pterostigma black (but brown by transmitted light), braced and covering

four to five cells. Nodal index: $\frac{13-17}{14-12} \mid \frac{18-13}{9-11}$, anal-loop poorly formed, two-celled,

anal field four to five cells deep, basal incomplete antenodal positive in all wings. Abdomen black, marked with greenish yellow as follows: the sides of segments 1 to the base of segment 3, a middorsal stripe which is moderately broad and trilobate on segment 2, then tapers from the base of segment 3, becoming linear to as far as segment 7, where it again dilates as a basal ring which rapidly tapers nearly to the end of the segment. The sides of segments 7-10 dark ferruginous. Anal appendages black, of the conventional form of the genus, the superiors parallel, cylindrical at base, becoming pyriform and tapering to a fine point at apex; furnished ventrally with a very robust subbasal spine. The inferiors markedly divaricate, the branches almost in a straight line, the apex curled slightly up and preceded by a small shallow oval pit on the upper surface.

FEMALE. Abdomen 41-43 mm. Hindwing 36 mm. Pterostigma 4 mm.

Closely similar to the male, differing in the following points, some of which are evidently due to loss of colouring from decomposition: the spots on the labrum very small, a green geminate spot behind the occiput which is tumid, raised and cut sharply away at its junction with the eyes. The humeral stripes invisible (evidently from decomposition as a detached portion of the shell of the thoracic side is still bright grass green, whilst the rest is dull uniform brown), the femora castaneous changing to black at distal ends. The wings palely uniformly tinted, the pterostigma ochreous, longer and narrower than in the male, nodal index very similar: $\frac{12-17}{12-12} \mid \frac{17-11}{11-11}, \frac{13-18}{13-11} \mid \frac{17-12}{12-11}$, anal field

only four cells deep. Abdomen black, the markings, where preserved, are almost identical to those of the male, but the ferruginous colouring on segments 8-10 extends on to dorsum save for a fine black middorsal carina on segments 8 and 9. Anal appendages black, as long as segment 10. Ovipositor (Fig. 3g), two small narrow triangular processes fused mesially, with apices divaricate, half the length of segment 9.

This new species is best recognized by the shape of the antehumeral stripes, by the short pterostigma of the male and by the dorsal subapical pit on the branches of the inferior anal appendage. I believe that the two sexes here described belong to one insect, the only doubts being the bright coloured occiput of the female (black in the male) and the invisible humeral stripes in the female. As the humeral stripes are only visible on one side in the male, it is extremely probable that their absence in the female can be accounted for by the action of decomposition.

Type male in my own collection, *allotype* female in the Coryndon Museum collection; both will eventually be deposited in the British Museum.

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THREE NEW SPECIES OF ODONATA FROM EASTERN AFRICA

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Chlorocypha jacksoni n.sp.

DESCRIPTION

Holotype male. Face in front and below blackish ferruginous, genae and front of occiput canary yellow. Head above black; on the frons two large apple-green confluent spots in front of the anterior ocellus, with a small yellow spot just anterior to each of the larger spots; occipital plate brown; postocular spots orange. Thorax black; with a very broad chrome-yellow lateral band covering almost the whole of the synthoracic sides, continued as a subdorsal stripe across anterior end of mesepisternum and along the prothorax; traces of white pruinosity on ventrum of synthorax. Coxae ferruginous, rest of legs black.

Abdomen above entirely brick red except a black basal band on 1, and a pair of small black hyphens near apices of 2-5; 1 laterally chrome yellow, ventrally black; the yellow continuing as a yellow lateral line on 2, which is otherwise red laterally, black ventrally. Rest of abdomen red at sides, only black mid-ventrally. Superior appendages black, inferiors brick red with black tips.

Wings tinged with greenish; pterostigma black; discoidal cells each with one cross-vein. Abdomen (without appendages) 21 mm., hindwing 24 mm., pterostigma 1.5 mm.

Allotype female. Marked rather like the male, with the following differences: epistome with a light ferruginous patch; yellow at side of face extending on to edge of epistome; frontal spots yellower and slightly larger. Median carina on mesepisternum ferruginous; lateral thoracic band pale yellow instead of chrome.

Abdomen above light brown; sides of 1-2 with a pale yellow band corresponding to the chrome marking of the male, but continuing to terminal segments as a discontinuous yellowish lateral band. The abdomen marked with black: 2-3 with black apical band and black ventrally; 4-7 similar but with the two black areas linking up by severing the yellow lateral band; 8 with the lateral yellow band broad, the ventrum black; 9 mainly black with brown median dorsal stripe and latero-distal yellow spot; 10 yellow above, black below. Cerci black.

Wings tinged with greenish; pterostigma brown with yellow centre; discoidal cells with single cross-vein.

Abdomen 20 mm., hindwing 27 mm., pterostigma 2 mm.