

NOTES ON SOME AFRICAN REPRESENTATIVES OF THE GENUS
PSEUDAGRIONSELYS, 1876, WITH DESCRIPTIONS OF TWO NEW
 SPECIES (ZYGOPTERA: COENAGRIONIDAE)

E. PINHEY

National Museum, P.O. Box 240, Bulawayo, Rhodesia

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P. cyathiforme sp. n. (♂ holotype: Mount Coffee, Liberia) and *P. malagasoides* sp. n. (♂ holotype: Bendija, Liberia) are described and illustrated on the basis of single males in the collection of the United States National Museum. Descriptive notes are given on a male of *P. glaucoideum* Schmidt from Ibadan, Nigeria. Notes on colours of males of 15 African *Pseudagrion* species are added. They are accompanied by colour illustrations.

INTRODUCTION

This paper is primarily concerned with some interesting species, two of them new, which were found amongst several large consignments of African Odonata kindly submitted for examination from the Smithsonian Institution by Dr. Oliver S. Flint. Notes on colours of some of the males of this genus are accompanied by a colour plate.

Three species, all represented by single males, have been selected for special interest. One is an abnormally large Nigerian specimen of *P. glaucoideum* Schmidt, but the other two represent two new and remarkable species from Liberia. These two belong to Group A (PINHEY, 1964), both being highly distinct from all other known continental African species. One of them, *P. cyathiforme* spec. nov., collected at the end of the 19th century by the indomitable Mrs. Sharp has uniquely unbranched superior anal appendages. In all other African members of this group these appendages are bifid. The other, *P. malagasoides* spec. nov., is more akin to the distinctive Madagascar Group of the genus. In Madagascar, Réunion and Mauritius one other species, *P. punctum* (Rambur) belongs to the continental Group B, to which *P. glaucoideum* also belongs.

PSEUDAGRION GLAUCOIDEUM SCHMIDT¹

Pseudagrion glaucoideum SCHMIDT, 1936: 66-67; - PINHEY, 1962: 125; - PINHEY, 1964: 77; - PINHEY, 1971: 1; - *Pseudagrion isidromorai* SART, 1967: 5.

Material. - Nigeria: Ibadan, 11.III.1919, 1 ♂, A.W.J. Pomeroy.

The above synonymy and the variation in this species were recorded by PINHEY (1971). The holotype ♂ *glaucoideum*, in Mus. Nat. d'Hist. Nat. from Congo (Zaire) was described by SCHMIDT (1936). It is discoloured, but in life the species has pale blue markings on the head, thorax and abdomen. On the head the black zones are variable but quite commonly the postclypeus is partly or wholly black, the vertex broadly so.

A male in the United States National Museum collection from Nigeria is one of the darker examples but distinguished by the unusually large size: abdomen (without anal appendages) 36,5 mm; hindwing 24 mm. In the Bulawayo National Museum the range in length of the male abdomen is 32 - 35,5 mm. The abdomen of the type measures (with appendages?) 35,5 mm. SART (1967) gives 31 mm for the abdomen of the type *isidromorai*, probably excluding the appendages, which would still indicate a small individual of this species.

More material would be required from Southern Nigeria to decide whether there is a Nigerian subspecies of large size.

Distribution: Northern Zaire, Congo (Brazzaville), Cameroon, Rio Muni, Southern Nigeria and Liberia.

PSEUDAGRION CYATHIFORME SPEC. NOV.

Figures 1 a - i

Material. - Liberia: Mount Coffee, 1896 (month unspecified), 1 ♂, Mrs. SHARP (holotype, United States National Museum of Natural History, Washington, D.C.).

A single very slender black male from Liberia is an interesting new species with rather divergent affinities. The superior appendage is a massive scoop-like structure; hence the specific name. The 10th abdominal segment bears no

¹The description of this (and several other) species was published in a paper that appeared posthumously under the name of F. RIS (1936), but which had been prepared for publication, on the basis of Ris' manuscript notes, by Erich SCHMIDT, who also gave names to the species described. On page 4 of the paper Schmidt states "... Die neuen Arten tragen im MS noch [die] Buchstabenbezeichnung und keine Namen; diese sind erst vom Herausgeber [= E. Schmidt] gebildet worden". Also the editorial footnote on the same page states explicitly that "Als Author der neuen Namen gilt also der Herausgeber E. Schmidt". - Ed.

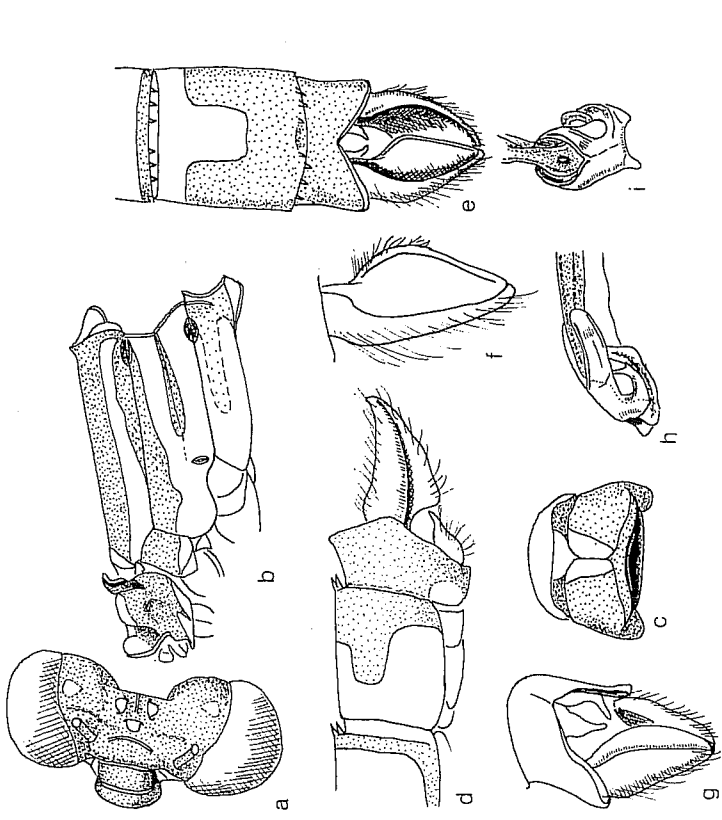


Fig. 1. *Pseudagrion cyathiforme* spec. nov. holotype male: (a-b) head and thorax; - (c) prothoracic pattern, dorsally; - (d-e) segments 9-10 and appendages, from left and dorsally; - (f) left superior appendage (more enlarged); - (g) anal appendages, ventrally; - (h-i) prophallus.

terminal spines so that the species belongs to Group A (PINHEY, 1964), yet the superior appendage is unbranched, the first member of this Group in Continental Africa to have such a condition in the superior appendage.

Male holotype (mature). A very slender species. Labium ochraceous white; orbits ventrally cream-brown with thin white pruinosity, these orbits black posteriorly. Genae and front of orbits dull olive green. Labrum and postclypeus glossy black, anteclypeus blackish brown. Frons, vertex and orbital lobes above all black except for ill-defined, small isolated grey-green postocular spots. Antennal bases black (flagella lost).

Prothorax mainly black, the anterior collar, a double dorsal triangular macula and a double spot above the base of each prothoracic leg blue-grey (these greyish or bluish areas probably brighter blue in life). The black hindlobe is narrow and below it there is a prominent black inferior lip (black in figure). Synthorax

black to below humeral suture with faint grey-blue antehumeral stripes which are almost half as broad as the mesepisternum on one side at ventral end but tapering dorsally. Sides pale blue-grey but with so much staining that the black areas are poorly defined and in the figure it has been necessary to show markings studied on both sides of the metathorax. Along the first lateral suture there is an incomplete band and the dorsal depressions of humeral and second lateral sutures are distinctly black; but the extent of the metepimeral black is less easily observed. Legs ochreous, the femora ferruginous posteriorly ending distally in a black macula at the knee-joint.

Venation ferruginous, the radial and median veins straight. Pterostigma almost rhomboidal, but its proximal edge is curved and sloped, the distal edge square; black in the centre, lined with ferruginous. The anal vein leaves the margin at Ac, as in most of the genus, and the quadrilaterals are of normal shape. Forewing with 11-12 Px, hindwing 9 Px. IR₂ in forewing originates at the 9th Px, R₃ at 6th Px.

Abdomen with a continuous black dorsal band on segments 1-7, of the usual shape, somewhat constricted before the large macula at distal ends of these segments. Terminal segments stained but segment 8 pale grey-blue with black distal annulus and ventral band; segment 9 blue basally, black distally, the black intruding anterior dorso-laterally and 10 all black except a sub-lateral basal orange-brown macula. Superior appendage massive, very like *P. deningi* Pinhey, more than twice as long as segment 10, ferruginous and rather scoop-like. In lateral view this appendage is broadly triangular, inturred slightly at apex, with a stout, tapering dorsal ridge subtending a triangular flange; on inner aspect this appendage is concave and without a strong apical contact surface. Inferior appendage thinly chitinized, very short, with curved acuminate apex.

Prophallus with simple flagella, not spreading into broad funnels.

Abdomen (without appendages) 28,00 mm; hindwing 17,2 mm.

By the slender thorax and abdomen, as well as the rhomboidal pterostigma this single male is very like an *Aciagrion* Selys, but in thoracic markings and anal appendages it is shown to be a *Pseudagrion* Selys. It is one of the blacker species and by reason of the absence of terminal dorsal spines on abdominal segment 10 it belongs to the *fuscigerum* - *cauffman* group, Group A (PINHEY, 1964), despite the fact that the superior appendage is unbranched. Whilst the anal appendages are reminiscent of *P. deningi* PINHEY (1964, Group B), the new species differs from this in the much more slender thorax and abdomen and *deningi* has the face mainly yellow, the frons with a yellow frontal band and a much blacker thorax. In Group A this new species is nearest to the much larger *P. thenartum* FRASER (1955) but differs in markings. The massive superior appendage of *thenartum* has a more sinuous outline, not triangular, and there is a very large apical contact hook.

The female is unknown but it would appear that from the shape of the massive superior appendage of the male and its insignificant inferior appendage, the prothoracic contact structures of the female are probably of a simplified form.

PSEUDAGRION MALAGASOIDES SPEC. NOV.

Figures 2 a - k

Material. *L i b e r i a*: Bendjia, Smithsonian Firestone Expedition, 1940, 1 ♂, W.M. MANN (holotype, United States National Museum of Natural History, Washington, D.C.).

A very long, slenderly built blue-green species, remarkable in the similarity in form of the anal appendages to certain of the Madagascar species of the genus which, with the exception of *P. punctum* (Rambur), form a group distinct from those of mainland Africa but nearer Group A (PINHEY, 1964).

M a l e holotype (mature). - Slender and elongated. Labium and mandibular bases cream, orbits below all pale blue. Labrum, genae, front of orbits, anteclypeus and lateral angles of postclypeus blue-green; rest of postclypeus glossy black with brown shades. Frons and vertex pale brown with black traces, the orbital edges blue-green. The black areas consist of a bar at base of frons from which extends a narrow band to the anterior margin; fasciae to the sides of the anterior ocellus and between the posterior ocelli and fasciae demarcating the large post-ocular spots, which have smaller pale blue eccentric spots at their distal corners. Antennae pale brown at base, the flagella ferruginous.

Prothorax tinged with pale bronze-brown dorsally on middle and hind lobes, laterally and the anterior collar pale blue; a sinuous brownish black striga on middle lobe. Hindlobe short in middle, widened laterally; with a short central inferior lip. Synthorax slender; pale bronze-brown dorsally to below humeral suture, but not as far as first lateral suture, with minute black dorsal spots on the depressions of humeral and second lateral suture and a spot on first lateral suture at one third from dorsal end. Sides pale blue, whiter ventrally. Legs cream-coloured; a blue-grey posterior suffusion on coxae; fore-femur with short post-lateral brown striga and a dark ferruginous macula above knee-joint; mid- and hind-femora with almost complete ferruginous posterior stripe and a macula at knee. Setae ferruginous.

Venation brown. Wing apices fractured, the apical part of left forewing lost. Pterostigmata rhomboidal, as in *Aciagrion* Selys, the centres pale brown with very fine cream edge. Anal vein leaves margin at Ac. Quadrilaterals of normal shape. Right forewing with 13 Px, hindwings with 12 Px. In right forewing IR₂ originates at 10th Px. The wing is too shattered for examination of R₃.

Abdomen very slender, pale blue on segments 1 - 2, with bronze-black dorsal band, incomplete on segment 1. Segments 3-8 more broadly black, yellow sub-laterally. Segments 8-9 blue with very narrow black annulus at distal end, broken

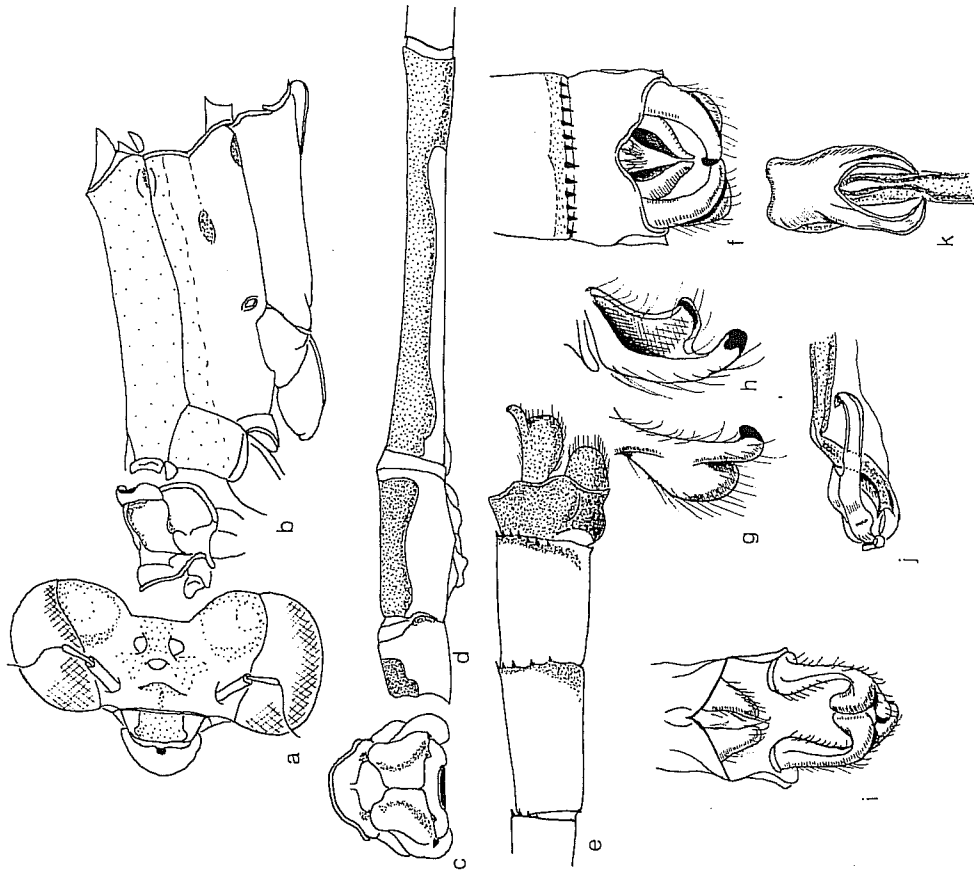


Fig. 2. *Pseudagrion malgasoides* spec. nov. holotype male: (a-b) head and thorax; - (c) prothorax, dorsally; - (d) segments 1-3; - (e) segments 8-10 and appendages; - (f) segment 10 and appendages, dorsally; - (g) left superior appendage, dorso-laterally; - (h) left superior appendage, dorsally; - (i) anal appendages, ventrally; - (j-k) prophallus.

dorsally on segment 8. Segment 10 black, with orange-brown latero-basal macula. Superior anal appendage deep and massive, slightly longer than segment 10; curved and somewhat forcipate, shaped in side view like a fist with projecting thumb. The apical portion has a cylindrical upper branch curved inwards to a stout contact point and a shorter, broad ventral flange incurved to a broad

contact ridge. The ventral branch is hollowed out inwardly. Inferior appendage short and trapezoidal in lateral view, more tapered apically and hollowed out inwardly.

Prophallus with long slender flagella terminating in acuminate apices. Abdomen (without appendages) 38,5 mm; hindwing 25,5 mm.

This very large species is peculiar in several features. By reason of its locality, Liberia, in the Continental Ethiopian region and the lack of terminal spines on the 10th abdominal segment it belongs naturally to Group A (PINHEY, 1964). Yet the pale coloration of head and thorax is more characteristic of Group B. The massive anal appendages are nearest *P. risi* Schmidt (RIS, 1936) (cf. footnote 1 on page 318) and *P. serrulatum* Karsch of the continental fauna but distinctive in shape, with the longer upper branch. This new species, in anal appendages, is distinctly closer to *P. malgassicum* Schmidt and to *P. igniceps* Fraser, of the main Madagascar group of species, hence the specific name applied here. It is, however, quite distinct in these appendages from known species of the Malagasy subregion. It can be regarded as a link between Continental African Group A and the Madagascar Group.

LIVING COLOURS IN MALES OF SOME AFRICAN REPRESENTATIVES OF THE GENUS *PSEUDAGRION* SELYS

Fifteen different males, all colourful species, have been selected to illustrate the usual coloration found in mature males of African species. A few notes on the variation and distribution are given here. References to and descriptions of all these species may be found in PINHEY (1964).

Group B

P. nubicum Selys (Fig. 3 a)

Closely allied to *coelestis* Longfield but apart from the differences in genitalia it is a greener species in life. There are paler and melanic varieties. Widespread from Southern Africa to the North African Palaearctic region.

P. coelestis Longfield (Fig. 3 e)

A much bluer species in life than *nubicum*. There is a more melanic form *sambfya* Pinhey. Its known range is restricted to Angola, Rhodesia, Botswana and Zambia.

P. asseguui Pinhey (Fig. 3 d)

Another very blue species, with melanic tendencies. Distributed from Transvaal and Botswana to southern Zaire.

P. glaucescens Selys (Fig. 3 c)

A very slender, pale blue and green species, normally sparsely marked with black but occasionally exhibiting melanism. Another variety or perhaps a local

subspecies in Mozambique has the face and vertex pale reddish orange (*f. mozambicensis* Pinhey). Distributed from Southern to Eastern Africa, with a few records in West Africa.

P. lindicum Grünberg (Fig. 3 b)

Closely allied to *glaucescens* but with deeper blue markings and more black than in the normal form. It is primarily a coastal species known from Mozambique to Kenya.

P. sudanicum rubroviride Pinhey (Fig. 3 f)

A dark metallic bronze green subspecies with red face. The nominotypical subspecies *sudanicum* Le Roi is bluish green on the face and thorax. Both races tend to variation and a melanic form *vansomereni* Pinhey is known from Uganda. Distributed from the Limpopo River northwards to Uganda, Southern Sudan and to Nigeria.

P. acaciae Förster (Fig. 3 g)

A slender red species normally with restricted dark markings but occasionally with melanic form *hamoni* Fraser appearing amongst more typical ones. It is not a racial taxon. A very widespread species from South Africa to the North African Palaearctic region.

P. sjöstedti Förster (Fig. 3 i)

This normally red species is the most variable of this large genus in the Ethiopian region, both in size and the extent of black markings; with intergrades to darker or paler taxa. The Southern race *pseudosjöstedti* Pinhey is similar in markings to the nominotypical Cameroons subspecies. Melanic forms or races are *wittei* Fraser and *jacksoni* Pinhey. The Uganda subspecies *beadlei* Pinhey is exceptionally dark and pruinosed for Group B of the genus. This remarkable species is widespread in the Ethiopian region from Botswana and Rhodesia northwards to equatorial Africa.

P. massaicum Sjöstedt (Fig. 3 h)

A small red species, widespread in the Ethiopian region and not very variable. The damaged holotype of *P. chomae* PINHEY (1964: 90) is identical with this species (PINHEY 1967: 10).

Group A

P. coeruleipunctum Pinhey (Fig. 3 j)

This beautiful blue species, so pale and unlike most of this group of the genus, has a second form in both sexes which has the markings pale yellow on the head and thorax. Only known so far from East Angola, Southern Zaire and Northern Zambia.

P. melanicterum Selys (Fig. 3 k)

More typical of group A in the extent of black on the head, thorax and abdomen. Minor variations in the frontal band and antehumeral stripes occur. Widespread from Zambia to equatorial Africa.

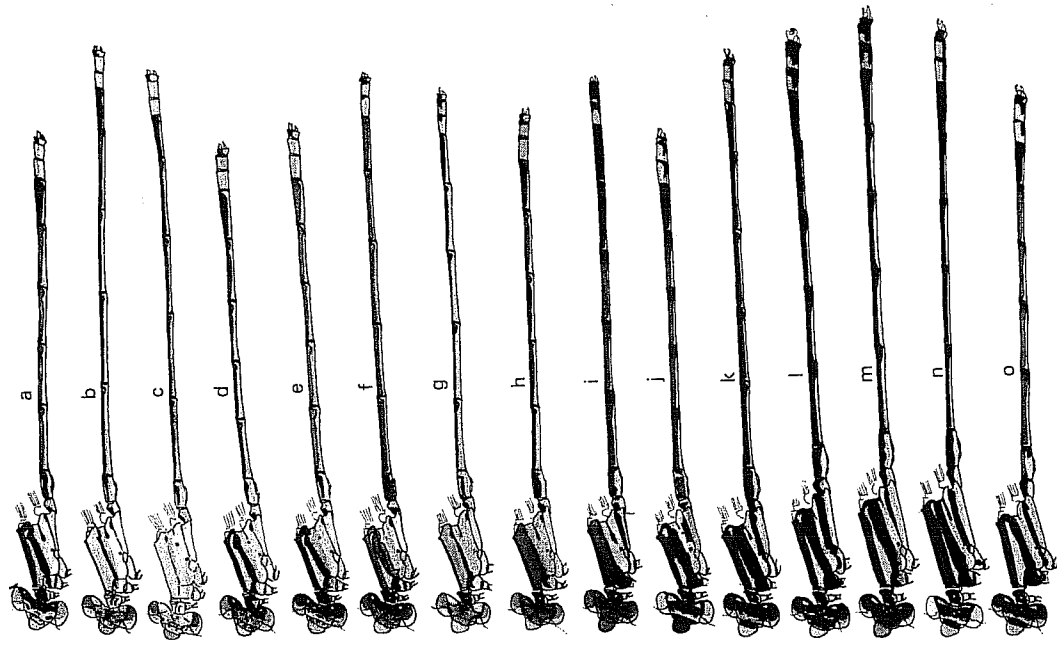


Fig. 3. Colour patterns of mature male *Pseudagrion* Selys: (a) *nubicum* (Malawi); - (b) *lindicum* (Mozambique); - (c) *glaucescens* (Zambia); - (d) *assegaii* (Botswana); - (e) *coelestis* (Botswana); - (f) *sudanicum rubroviride* (Victoria Falls); - (g) *acaciae* (Limpopo River); - (h) *massaicum* (Rhodesia); - (i) *sjöstedti sjöstedti* (Cameroons); - (j) *coeruleipunctum* (Zambia); - (k) *melanicterum* (Zambia); - (l) *epiphonematum* (Cameroons); - (m) *serulatum* (Cameroons); - (n) *hageni tropicanum* (Rhodesia); - (o) *kibalense* (Congo-Brazzaville).

P. kibalense Longfield (Fig. 3 o)

Closely allied to *melanicterum* but easily distinguished by the broader antehumeral stripes which are pale bluish green or blue in life but by postmortem discoloration nearly always become violet in colour. Distributed from Zambia northwards to Uganda.

P. serrulatum Karsch (Fig. 3 m)

A large species with the pale markings on the head and the antehumeral stripes varying from a shade of yellow to orange. An equatorial African species.

P. epiphonematicum Karsch (Fig. 3 l)

Another large equatorial species with yellow markings distinguished by the regularly broken antehumeral stripes. Occasionally, the stripes may be broken in related species, other than the very distinctive *coeruleipunctum*. Another equatorial African species.

P. hageni tropicanum Pinhey (Fig. 3 n)

A slender taxon, variable in size. The nomino-typical subspecies *hageni* Karsch, from the Cape Province, has the antehumeral stripes orange instead of green and the thoracic black marking is more extensive. Very widespread in continental Ethiopian Africa.

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² For the authorship of this paper cf. footnote 1 on page 318.