

emerald dragonfly (*Somatochlora margarita*). United States Fish and Wildlife Service Cooperative Agreement No. 14-16-0002-86-925, Amendment No. 7, pp. 1-17.

Iyakawa, K., 1971. Life-history of *Somatochlora viridaenea viridaenea* Uhler with notes of nymphs of *S. v. atrovirens* Selys (Odonata, Corduliidae). Bulletin of the Sugadaira Biological Laboratory of Tokyo Kyoiku University 4: 31-46.

Jünchberg, P., 1932. Beiträge zur Kenntnis der Biologie der Libellenunterfamilie der Cordulinae Selys. Internationale Revue der Gesamten Hydrobiologie und Hydrographie 27: 265-302.

Itzhard, A.E., 1936. Notes on *Somatochlora ozarkensis* Bird (Odonata, Libellulidae, Corduliinae). Entomological News 47: 99-101.

Offens, W.P. & W.A. Smith, 2006. Description of the larva of *Somatochlora incurvata* Walker (Anisoptera: Corduliidae). Odonatologica 35: 379-383.

Jünchberg, K., 1990. Autökologie von sechs Libellenarten der Moore und Hochmoore des Schwarzwaldes und Ursachen ihrer Moorbinding. Ph.D. Thesis, Universität Freiburg.

Kniesen, K.J., 1975. Description of the nymph of *Somatochlora provocans* Calvert (Odonata: Corduliidae). Florida Entomologist 58: 105-110.

**The name-bearing types of Odonata held in the Natural History Museum of Zimbabwe, with systematic notes on Afrotropical taxa. Part 2: Zygoptera and descriptions of new species**

Klaas-Douwe B. Dijkstra

National Museum of Natural History Naturalis, P.O. Box 9517, 2300 RA, Leiden, The Netherlands. <dijkstra@nmm.nl>

Key words: Odonata, types, taxonomy, synonymy, Africa, Zimbabwe, E.C.G. Pinhey.

**ABSTRACT**

Orthographic details of 118 name-bearing types of Odonata and 11 'holotypes' of forms, without nomenclatural status, are provided in two parts: the second and present paper deals with Zygoptera. The taxonomy of the *gracilis*-group of *Chlorocypha* and the Afrotropical members of *Prodasineura* and *Aciagrion* are discussed. *Chlorocypha fabamacula* is removed from synonymy with *C. witteii*; *Pseudagrion superbum* from *P. serrulatum*. *Chlorocypha busilewskyi* and possibly *C. hasta* are junior synonyms of *C. tenuis* – their treatment as a subspecies of *C. jacksoni* and *C. molindica* respectively is rejected; *Elatoneura tropicalis* of *E. cellularis*; *Agriocnemis dissimilis* of *A. palaeforma*; *Pseudagrion quadrioculatum* of *P. superbum*; *Pseudagrion williamsi* of *P. kersteni*; *Teinobasis malawiensis* of *T. aluauudi*. It was confirmed that *Chlorocnemis rossii* is a junior synonym of *C. flavipennis*; *Aciagrion congoense* of *A. africanum*; *Agriocnemis aligulae* of *A. maculachlani*; *Agriocnemis umbargae* of *Ceniagrion annulatum*; *Ischnura hilli* of *I. abyssinica*. *Africocypha ntaali* is definitely a junior synonym of *A. greyi*, but their synonymy with 'Libellago' *lacus-ephantum* must be investigated. *Chlorocnemis montana maccleeryi* is nearer *C. abbotti* than nomenclotypic *C. montana*, and is raised to species level. *Aciagrion heterosticta karamoja* is nearer *A. gracile* than nomenclotypic *A. heterosticta*, and is raised to species level pending further revision. *Aciagrion dondoense* sp. nov., a species formerly confused with *A. zambianse* and *A. congoense* (see above) is described. *Africallagma sinuatum* f. *fugax* pertains to a good species and is described as *A. pallidulum* sp. nov. The possible specific status of *Platycypha caligata* f. *lacus* requires further study. *Tribemmis integra* sp. nov., a species formerly confused with *T. basitincta* (see Part 1), is described. The spelling *Pseudagrion sjoestedti* (versus *P. sjoestedti*) is advocated.

**INTRODUCTION**

The present paper is the second of a diptych on the name-bearing types of Odonata held in the Natural History Museum of Zimbabwe in Bulawayo (NMBZ) mostly assembled by Elliot C.G. Pinhey, who worked there from 1955 to 1980. The paper aims to supply full details of the name-bearing types of the Zygoptera and to reappraise their taxonomic status. The Anisoptera were treated in Dijkstra (2007), where also more details about the collection and methods are provided.

Names of taxa are listed alphabetically under each family, followed in parentheses by their original generic combination and taxonomic status. Specimens pertaining to the genus *Chlorocnemis* are listed under Platycnemididae because of that genus's close similarity to *Allocnemis* (see *A. mitwabae*). Each name is followed by the full orthography of: 1. Accession label "Access. No./NMZ [number]"; 2. Envelope with identification hand-written with black ink, occasionally accompanied by descriptive or collection details; 3. Pink label with the type designation, hand-written; 4. White label with collection data, variably printed and/or hand-written; 5. One or two occasional additional white labels with notes, preliminary identifications or supplementary collection details. Lines are separated by a slash and a space. Texts have been copied as precisely as possible, including the use of capitals, spaces and abbreviations; assumed misspellings and relevant annotations are indicated or corrected in square brackets. Details of 'holotypes' of forms, which are not name-bearing, are given between square brackets. Where relevant, label data are followed by an annotation on the status or identification of the taxon, or the condition of the specimen. Taxa are considered as good species and specimens are in a good state unless stated otherwise. Details of non-NMBZ types are provided in all cases of new or reverted synonyms. Page numbers are provided for all publications where a taxonomic change has been made. See Dijkstra (2007) for acronyms of collections.

## Calopterygidae

*purpurea* (*Umma*) Pinhey, 1961b: 264. — 8217; *Umma purpurea* Pinhey  $\sigma$ ; HOLOTYPE  $\sigma$ / *Umma*/ *purpurea*/ Pinh. 1959; MAMFE/ B. CAMEROONS/ II - 58; PENJIS.

Known only from Mamfe-Takamanda area in SW Cameroon and Bioko, Equatorial Guinea (Vick 2002). Listed for Nigeria by Medler (1980) and may be expected there, but details are unknown.

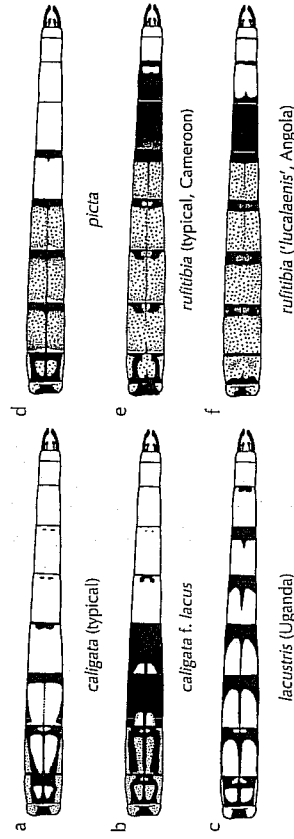


Figure 1: *Platycypha* male abdomen in dorsal view — (a) *P. caligata* typical; (b) *P. caligata* f. *lacus*; (c) *P. lacustris*, Uganda; (d) *P. picta*; (e) *P. rufitibia*, Cameroon (typical); (f) *P. rufitibia*, Angola ('*lucaensis*'). Dotted areas are yellow to brown or red, undotted blue.

*bamptoni* (ssp. *Chlorocypha croceus* [sic]) Pinhey, 1975: 7. — 7838; *Chlorocypha croceus* bamptoni/ Pinhey/  $\sigma$ ; HOLOTYPE  $\sigma$ / *Chlorocypha croceus*/ bamptoni/ Pinhey 1975; Serra de Chela, 6500' Tunda Vala/ 32Km N.W. Sa da Bandeira/ S.W. ANGOLA/ 20-X-1973/ Nat. Museum/ S. Rhodesia/ I. Bampton.

Differs from *C. crocea* Longfield, 1947 only by the blue of S3-10 extending slightly as an apical bar on the otherwise entirely black dorsum of S2.

*chingolae* (ssp. *Platycypha lacustris*) Pinhey, 1962a: 904. — 7311; *Platycypha lacustris* chingolae/ Pinhey/  $\sigma$ ; HOLOTYPE  $\sigma$ / *Platycypha lacustris*/ chingolae/ Pinhey 1961; CHINGOLA/ N. Rhodesia/ V - 1961/ Nat. Museum, S.R.

Variety of *P. lacustris* (Förster, 1914); Figure 1c shows a typical example.

*fabamacula* (*Chlorocypha*) Pinhey, 1961a: 41. — 7616; *Chlorocypha fabamacula*/ Pinhey/  $\sigma$ ; HOLOTYPE  $\sigma$ / *Chlorocypha fabamacula*/ Pinh/ 1960; Solwezi/ N. Rhodesia/ 2 1960/ Nat. Museum, S.R.

Pinhey (1962a: 902) made this a form of *C. wittei* Fraser (1955c: 10. Mubale River, Congo-Kinshasa; MRAC) but the holotypes are not conspecific (K.-D.B. Dijkstra unpubl.) and *C. fabamacula* should be treated as a good species [rejected synonymy]. Dijkstra (2003a) postulated that '*C. wittei*' (i.e. *C. fabamacula*) may be an all-red variety of *C. curta*, which typically has the abdomen termen blue (Figs 2c, d). This hypothesis was instigated by all-red Nigerian specimens (BMNH) that were otherwise identical to sympatric *C. curta*. Five similar males from PN Garamba in NE Congo-Kinshasa (JSNB, MRAC) were identified as *C. wittei* by Pinhey (1966c). Males from extreme SE Congo-Kinshasa (MRAC), near the *C. fabamacula* type locality, are only slightly darker, especially on S2. Pinhey (1971c) described a series of 55 *C. curta* males from Bangui, Central African Republic. Of these 39 were typical with S1-6 red and only S7-10 blue, while 13 had S6 all blue as well. The remaining three males had S6 partially blue, between half the segment and just a trace. If the extent of abdominal blue is variable, perhaps *C. fabamacula* is merely a regionally common variety of *C. curta*. Unlike in Nigeria, *C. fabamacula* was not collected with *C. curta* in Congo-Kinshasa and Zambia. Their status must be resolved by genetic comparison, or by behavioural and ecological study of sympatric populations.

*frigida* (*Chlorocypha*) Pinhey, 1961a: 43. — 7691; *Chlorocypha frigida* Pinhey/  $\sigma$ ; HOLOTYPE  $\sigma$ / *Chlorocypha frigida*/ Pinh. 1960; Zambezi/ MWNILUNGA/ N. Rhodesia/ 2 1960/ Nat. Museum, S.R.

Previously known only from NW Zambia (Pinhey 1984), but BMNH possesses a male from Kambove, 250 km further east in Congo-Kinshasa. *C. frigida* is similar to *C. sefysi* Karsch, 1899 and differs mainly in the reduced extent of black on thorax and abdomen (Figs 2a, b, e, f), but *C. sefysi* is a variable species (see Gambles 1975). Pinhey (1967a) stated that *frigida* has a blue and *sefysi* a yellow face, but the latter is pale blue in life (own observations). *C. sefysi* occurs from Guinea-Bissau to Cameroon; a huge geographic gap still separates *C. frigida*, which could merely represent under-collecting.

*greyi* (*Chlorocypha* (*Africocypha*) Pinhey, 1961b: 261. — 8039; *Chlorocypha greyi* Pinhey/♂; HOLOTYPE ♂/ *Chlorocypha* (*Africocypha*)/ *greyi* Pinh./ 1959; Widdicombe/ 2500. [British]. cameroons/ II 1958/ Nat. Museum/ S. Rhodesia. Pinhey (1967a: 165) made the subgenus *Africocypha* Pinhey, 1961 a full genus with two species: *A. lacuselephantum* (Karsch, 1899), of which he considered *A. nitaali* a junior synonym, and *A. greyi*. Following the discovery of marked colour change in the species, Pinhey (1971d: 220) added *A. greyi* to the synonymy. The conspecificity of Pinhey's (1961b) two males is beyond doubt, as they differ only in the age-dependent colour of S4-8: blue in the general *nitaali* and red in the mature *greyi*. However, the synonymy with *lacuselephantum* is based on the similarity between its female holotype and the allotype of *nitaali*. The latter was not collected with the *nitaali* holotype (at "Widdicombe/ Mamfe"), is notably larger than it and the *greyi* holotype (Hw 27.8 mm, vs 24.4-25.7) and differs in details of facial, thoracic and abdominal markings. Sexes are highly dimorphic in Chlorocyphidae, but normally how more similarity than this. Recently, females matching the *lacuselephantum* holotype and *nitaali* allotype were collected only with males of *Chlorocypha centripunctata* Gambles, 1975 (G.S. Vick in litt.). This has cast further doubt on Pinhey's association of the sexes, and suggests the synonymy of *centripunctata* (rather than *greyi* and *nitaali*) with *lacuselephantum*, although Pinhey (1971d) had extensive series of both sexes from Bioko, where *centripunctata* is unknown (Brooks & Jackson 2001). This matter requires further study, but as first revisor I propose to give *greyi* priority over *nitaali*: it represents the mature condition of the species and is also the type species of *Africocypha*. The generic status of *lacuselephantum* becomes uncertain if *greyi* and *nitaali* are removed from synonymy with it. A generic reassessment of Afrotropical Chlorocyphidae is warranted, however, as *Chlorocypha* may be paraphyletic (Dijkstra 2003b).

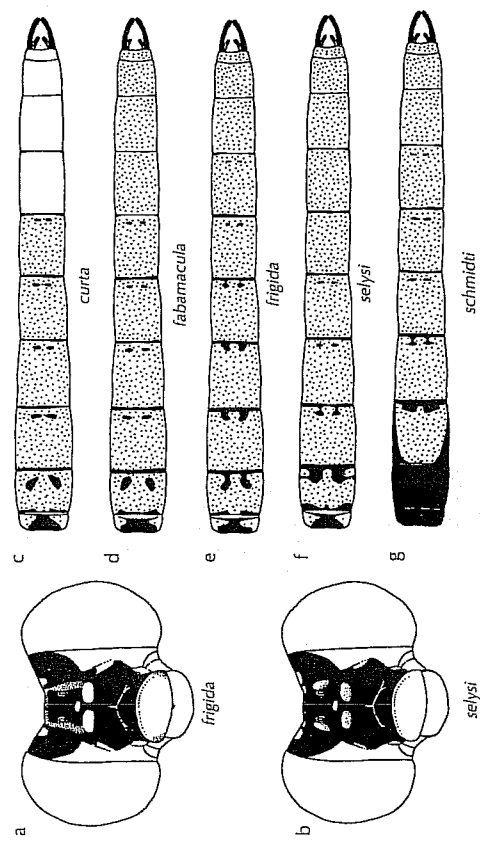


Figure 2: *Chlorocypha* males of the *dispar/rubida*-group — (a, b) head in frontal view: (a) *C. frigida*; (b) *C. selysi*; (c-g) abdomen in dorsal view: (c) *C. curta*, dominant form; (d) *C. fabamacula*; (e) *C. frigida*; (f) *C. selysi*; (g) *C. schmidti*. Dotted areas are red, undotted blue.

*hastata* (*Chlorocypha*) Pinhey, 1960: 510. — 8012; *Chlorocypha hasta* Pinhey/ 2nd O[xford].U[University]. Tanganyika Exp. ♂; HOLOTYPE ♂/ *Chlorocypha*/ *hastata* Pinh. 1959; Lubungwe R., 4000' nr. Kasangazi/ Mahali Peninsula/ TANZANIA/ 29-IX-1959/ Nat. Museum/ S. Rhodesia/ J.A.H. Cooke.

Belongs to the *gracilis*-group that, with the exception of the Lower Guinean *C. gracilis* (Karsch, 1899) (Fig. 3g), is centred in the Albertine Rift highlands and further includes: *C. tenuis* Longfield (1936: 468. Kibale Forest, Uganda; BMNH); *C. molindica* Fraser (1948: 9. Molindi River, Congo-Kinshasa; MRAC); *C. jacksoni* Pinhey (1952: 13. Mafuga Forest, Uganda; BMNH); *C. basileuskyi* Fraser (1955a: 23. Bururi, Burundi; MRAC). Pinhey (1967a: 196) treated *C. hasta* as a subspecies of *C. molindica* and *C. basileuskyi* of *C. jacksoni*, despite their distinctive markings (Figs 3a-f, h-m) [rejected combinations]. The markings of *C. basileuskyi*, *C. hasta* and *C. tenuis* have a similar configuration, but vary considerably, as observed in long series of a single species from SW Uganda, the characteristic black marking on S2 is even asymmetrical in the *C. basileuskyi* holotype (Figs 3h, k-m). Its head is damaged, but Fraser (1955a) illustrated a *tenuis*-like pattern (cf. Fig. 3c), and I consider *C. basileuskyi* as a junior synonym of *C. tenuis* [new synonymy]. *C. hasta* occurs isolated in W Tanzania, has especially prominent abdominal black markings (Fig. 3h) and lacks the white tibial streaks of *C. tenuis* (including '*basileuskyi*?'). However, *tenuis*-like specimens from Uganda (locality unspecified, BMNH) and Uvira, Congo-Kinshasa (MRAC) also have unstreaked tibiae, but relatively pale abdomens and thoraces (Fig. 3m). Perhaps variation is gradual along the Albertine Rift and *C. hasta* is merely a dark extreme of *C. tenuis*, but the highlands between Uganda and W Tanzania are almost unsampled. The closeness of the slender red species is demonstrated by two hybrid males *C. molindica* x *tenuis* discovered in SW Uganda (K.-D.B. Dijkstra, J.J. Kisakey unpubl.).

[*lacus* (morph *Platycypha caligata*) Pinhey, 1982: 222. — 7103; *Platycypha caligata caligata* (Selys)/ ♂/ Mbenje Island/ 13°26'S, 34°30'E/ Lake Malawi/ Malawi/ 8/5/80/ J.G.M. Wilson; Holotype ♂/ *Platycypha caligata caligata* (Selys)/ morph *lacus* nov./ Pinhey 1980.]

Described as a form of *P. caligata* occurring on rocky shores of Lake Malawi. Numerous males observed on an islet at Senga Bay (01 i 2002, K.-D.B. Dijkstra, RMNH) were much smaller and darker than typical *P. caligata*. Some had the basal segments darkened, whereas others had the typical all-blue abdomen. Apparently S1-5 melanise extensively with age, a trend not seen in riverine *P. caligata* (Figs 1a, b). Pinhey initially concluded that his specimens represented a new species, but later presumably only received young specimens, making him dismiss differences in abdominal markings as "post-mortem discoloration", leaving their consistently small size as the only distinction (Dijkstra 2005b). At Lake Chala on the Kenya-Tanzania border, *P. caligata* is similarly small, but does not darken with age (V. Clausnitzer in litt.). Probably Pinhey would have regarded the Lake Malawi specimens as a good species, had he known their coloration was not a preservation artefact (Dijkstra 2005b). Initial study has revealed a slight genetic distance between the Lake Malawi *Platycypha* and both riverine and lacustrine *P. caligata* from Kenya (H. Hadry in litt.). Genetic sampling of riverine *P. caligata* from Malawi is needed to substantiate that Lake Malawi is home to an endemic species of *Platycypha*, and not just dwarf *P. caligata* as seen at Lake Chala. Published after 1961, the name *lacus* Pinhey, 1982 is not available for future revision of this form. It is noteworthy that *P. pinheyi* Fraser, 1950 is known from seven males collected at four sites around northern Lake Tan-

anyika (BMNH, MRAC, NMBZ, NMKE). Although its precise habitat is unknown, it is like *P. fitsimensi* (Pinhey, 1950), but substantially smaller. The latter species, however, occurs widely disjunctly from Zimbabwe to South Africa.

*lucalaensis* (ssp. *Chlorocypha* [sic] *rufitibia*) Pinhey, 1967a: 176. — 7393; *Chlorocypha rufitibia*/lucalaensis Pinhey/ ♂/ Head + front of thor. orange-brown./ side of thor. red; abd. orange brown./ redder dorsally + posteriorly on each segm./ End. segm. sky blue. Ventral of 2-6/ crimson; Holotype ♂/ *Chlorocypha rufitibia*/lucalaensis ssp.n./ Pinhey 1964; Lucla R-228Km/ E. of Luanda/ N. Angola/ 8 X-1964/ Nat.Mus.S.R.

Pinhey (1967a: 175) transferred *C. rufitibia* to *Platycypha* Fraser, 1949, but described its subspecies in *Chlorocypha* Fraser, 1928. Their type localities lie 1800 km apart, but four males reported as *Libellago cancellata* Selys, 1879 by Schouteden (1934) from Butu Polo (label reads 'Buto-Tolo') and Kisala (MRAC) narrow the gap. This is in the Mayumbe Hills on the Congo-Brazzaville border in the far west of Congo-Kinshasa. The coloration of S2-6 is intermediate between *rufitibia* and *lucalaensis*, S8-10 are nearer the latter, indicating that the subspecies intergrade (Figs e-f). Males labelled as *Libellago lanceolata* Martin (Gabon; MNHN. — Pinhey 1967a: 175) and *L. cyanura* Selys (Congo Belge; ISNB. — own observations) also pertain to *P. rufitibia* (both *nomina nuda*).

*ntaali* (*Chlorocypha* [*Africocypha*]) Pinhey, 1961b: 263. — 8040; *Chlorocypha* (*Africocypha*) ntaali/ Pinhey/ ♂/ ♂ face pale green/ thor. base of abd. (?) green;

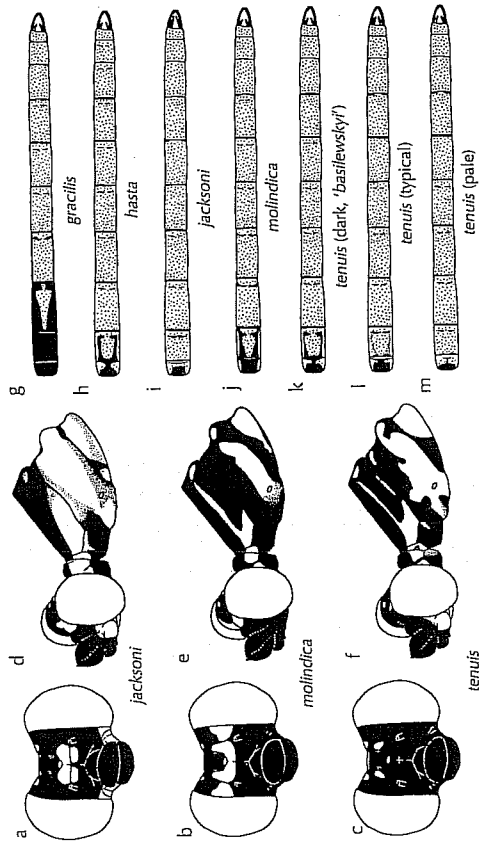


Figure 3: *Chlorocypha* males of the *gracilis*-group — (a-c) head in frontal view: (a) *C. jacksoni*; (b) *C. molindica*; (c) *C. tenuis*; (d-f) head and thorax in lateral view (both are all-black in *C. gracilis*): (d) *C. jacksoni*; (e) *C. molindica*; (f) *C. tenuis*; (g-m) abdomen in dorsal view: (g) *C. gracilis*; (h) *C. hasta*; (i) *C. jacksoni*; (j) *C. molindica*; (k) dark *C. tenuis* ('*basilewskyi*'); (l) typical *C. tenuis*; (m) pale *C. tenuis*.

HOLOTYPE/ *Chlorocypha* (*Africocypha*)/ ntaali Pinh./ 1959; Kumba Mambe/ crossroad/ Brcameroons/ II 1958/ Nat. Museum/ S. Rhodesia; Blue sp/ Kumba- / Mambe/ xroads.

Junior synonym of *A. greyi* and possible junior synonym of *A. lacuselephantinum*; see *A. greyi*.

*picta* (*Chlorocypha*) Pinhey, 1962b: 30. — 7424; *Chlorocypha picta* Pinhey/ ♂; HOLOTYPE ♂/ *Chlorocypha*/ *picta*/ Pinh. 1960; ETOUNBI Forest/ MAKOUA/ MOYEN CONGO/ VIII - 1960/ Nat. Museum/ S. Rhodesia; Penis.

Transferred to *Platycypha* by Pinhey (1967a: 175). Known only from Congo-Brazzaville (Aguesse 1966; Legrand & Lachaise 1980). The dorsum of S8-10 was described as blue, but Pinhey (1967a) stated that the abdomen is "dull reddish" with no mention of blue. The type series was stained, showing little contrast between segments. Four males from Djoumouna (i 1978, leg. unknown, coll. G.S. Vick) all have S6-10 distinctly blue, S6 differing from S7-10 by its apical black bar (Fig. 1d).

*rubriventris* (*Chlorocypha*) Pinhey, 1975: 9. — 7842; *Chlorocypha rubriventris*/ Pinhey/ ♂; Holotype ♂/ *Chlorocypha*/ *rubriventris*/ Pinhey 1975; Teixeira de Sousa/ ANGOLA/ Feb. 1965 C.A.Green.

Known only from the holotype and a paratype male. Similar to *C. crocea* but smaller; with red abdominal venter and blue centre of S2.

*rufitibia* (*Chlorocypha*) Pinhey, 1961b: 263. — 7388; *Chlorocypha rufitibia* Pinhey/ ♂; HOLOTYPE ♂/ *Chlorocypha*/ *rufitibia*/ Pinh. 1959; Widdicombe/ B. Cameroons/ 2-1958/ Nat. Museum/ S. Rhodesia; Penis.

Transferred to *Platycypha* by Pinhey (1967a: 175); see *P. r. lucalaensis*.

*schmidtii* (*Chlorocypha*) Pinhey, 1967a: 183. — 7461; *Chlorocypha schmidtii* Pinhey/ ♂; Holotype/ *Chlorocypha*/ *schmidtii*/ Pinhey 1965/ No 1368; Mt. Hoyo/ Bunia/ Ituri/ Congo Belge/ March 1959/ R.H. Carcasson; *C. dispar*/ *cordosa* Fraser/ (?cyanifrons/ Selys).

Robust species, easily identified by male's entirely black head, thorax and S1-2 (Fig. 2g). Described in honour of Schmidt (1951a), who reported specimens assembled by Rudolf Grauer in 1910 as *Libellago dispar cordosa* (nec Fraser, 1947) from "Urwald Moera", "Urwald Beni" and "N.W. Tanganjika". Pinhey interpreted the latter as NW Tanzania, but as Schmidt (1951b) reported *Proischnura subfurcata* (Selys, 1876) collected by Grauer from "Urwald (Primeval forest) behind the bordering mountains of N.W. Tanganyaka[sic]-Sees", that interpretation appears incorrect. A male from Irangi (24 viii 1985, G. von Rosen, MRAC) is also from E Congo-Kinshasa, lying between the previous localities.

Synlestidae

[*nigerrima* [sic] (morph *Chlorolestes fasciata* [sic]) Pinhey, 1980a: 3. — 2; [pinned, no envelope text]; Holotype ♂/ *Chlorolestes fasciata* (Burm.)/ morph. *nigerrima* Pinhey, 1979; Zoutpansberg, 1415m/ N. Transvaal/ 3-XII-1978/ Falc[on]. Coll[eg]. Expedition] (Nat.Mus.); F. Oldreive's/ Outlook Est/ 22° 59'S 29° 50'E/ Louis Trichardt.]

Dark variety of *C. fasciatus* (Burmeister, 1839); correct spelling is *nigerrimus*.

*aldabrensis* (ssp. *Lestes unicolor*) Blackman & Pinhey, 1967: 28. — 464; *Lestes unicolor* *aldabraensis* [sic] Pinhey/♂; Holotype ♂/ *Lestes unicolor* *aldabraensis* [sic]/ subsp. nov./ Pinhey, 1966; A.A.O. 2/ Near Wilson's Well/ ALDABRA Isl./ 24-XI-1964/ Nat. Museum/ S. Rhodesia; / in Cop. Transferred to *L. ochraceus* Selys, 1862 by Pinhey (1980b: 471), although Gambles (1976) emphasised that *L. unicolor* McLachlan, 1895 is a distinct species.

*amicus* (*Lestes*) Martin, 1910: 91. — 690; *Lestes amicus* Martin/♂; NEOHOLOTYPE ♂/ *Lestes amicus* Martin/ design. E. Pinhey./ June 1978; CHILUVO Hills/ Villa Machado/ MOCAMBIQUE/ 14-XI-1967/ Nat.Mus.Bulawayo/ Leg. E. Pinhey.

Pinhey (1980b: 382) designated the neotype, as the holotype is allegedly lost.

*tarryi* (*Lestes*) Pinhey, 1962b: 20. — 854; *Lestes tarryi* Pinhey ♂; HOLOTYPE ♂/ *Lestes tarryi* Pinh. 1961; MAILUMBA/ N. NIGERIA/ 15-IV-1960/ Nat. Museum/ S. Rhodesia.

Regarded as a small form of *L. plagiatus* (Burmeister, 1839) by Pinhey (1980b: 411).

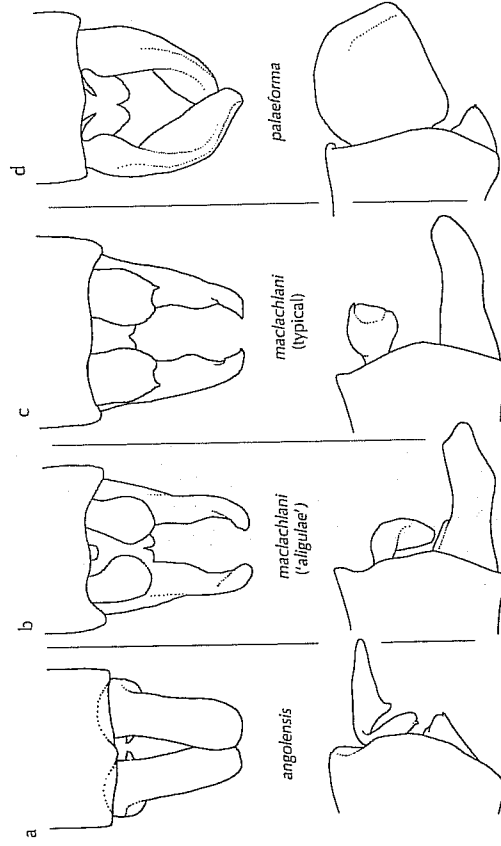


Figure 4. *Agriocnemis* male appendages in dorsal (above) and lateral views (below) — (a) *A. angolensis*, N Botswana; (b) *A. maclachlani*, Uganda (*aligulae*); (c) *A. maclachlani*, Benin (typical); (d) *A. palaeiforma*, Uganda.

*gilliesi* (*Amanipodagrion*) Pinhey, 1962b: 22. — 1056; [crossed out: *Lestes gilliesi* Pinhey]/ ♂/ *Amanipodagrion*/ *gilliesi* Pinhey; HOLOTYPE ♂/ *Amanipodagrion*/ *gilliesi*/ Pinhey 1960; Amani/ E. Usambara Mts./ nr Tanga, TANG[anyik]a/ V 1959/ Nat. Museum/ S. Rhodesia/ leg. M.T. Gillies.

Rediscovered in 2001 by Clausnitzer (2003b), who indicated that specimens collected in 1962 (BMNH) remained unmentioned in the literature, but this record was published by Pinhey (1964b). Only one population is known along 1 km of stream in the Amani-Sigi Forest, E Usambara Mts, NE Tanzania.

#### Coenagrionidae

*aligulae* (*Agriocnemis*) Pinhey, 1974a: 235. — 4457; *Agriocnemis aligulae*/ Pinhey/♂; Holotype ♂/ *Agriocnemis*/ *aligulae*/ Pinhey, 1973; Congo Belge, P.N.G./ Miss. H. De Saeger/ II/dd/8, 6-ix-1951/ Rec. H. De Saeger, 2383; E. Pinhey det., 1963/ *Agriocnemis*/ *machlachlani* [sic]/ Selys ♂.

Separated from the western *A. machlachlani* Selys, 1877 on the basis of slight differences in the male prothoracic hindlobe and cerci. Only the latter is easily appreciated: *machlachlani* has the cerci hollowed out at the apex but with almost no ventral process, while *aligulae* has it scarcely hollowed but with a long ventral process (Figs 4b, c). Two males with an intermediate condition from Lokutu in the central Congo Basin (30 x - 01 xi 2004, K.-D.B. Dijkstra, RMNH) lead me to support d'Andrea & Carfi (1997: 167), who examined type specimens of *A. aligulae* and synonymised it with *A. machlachlani*.

*chomae* (*Pseudagrion*) Pinhey, 1964c: 90. — 6258; *Pseudagrion chomae* Pinhey/♂; HOLOTYPE ♂/ *Pseudagrion*/ *chomae*/ Pinhey 1962; Choma/ N. Rhodesia/ X - 1960/ Nat. Museum, S.R.

Junior synonym of *P. massaicum* Sjöstedt, 1909 (Pinhey 1967b: 10).

*chongwe* (*Pseudagrion*) Pinhey, 1961a: 26. — 5323; *Pseudagrion chongwe* Pinhey/♂; HOLOTYPE ♂/ *Pseudagrion*/ *chongwe*/ n. sp./ Pinh. 1960; Chongwe 96D/ N. Rhodesia/ 20-III 1960/ Nat. Museum, S.R./ R.C. Denning; *Pseudagrion*/ sp. nov./ Holot. ♂/ black, no/ antehumerals/ Labrum bluish/ legs black/ abd. 2 above/ black; pt./ brown. sup./ app. like *salisburyense*.

Junior synonym of *P. salisburyense* Ris, 1921 (Pinhey 1967c: 21).

*coeruleipunctum* (*Pseudagrion*) Pinhey, 1964a: 103. — 5223; *Pseudagrion coeruleipunctum*/ Pinhey ♂ [sic]; Holotype ♀/ *Pseudagrion*/ *coeruleipunctum*/ Pinhey 1963; Lurchigena River/ 16mls E. of Caianda/ ANGOLA/ 10-V-1963/ Nat. Mus./ S. Rhodesia.

Described from a series of females from the type locality in extreme E Angola. Otherwise known only from four specimens, including the only two males known, from Kasomeno in NE Zambia (Pinhey 1967c). Unique by markings, with two varieties in both sexes — wholly blue, or with head and thorax bright orange —, and appendages (Fig. 5a).

*cuneistigma* (*Enallagma*) Pinhey, 1969b: 4. — 3436; *Enallagma cuneistigma* Pinhey/♂; Holotype ♂/ *Enallagma/ cuneistigma*/ Pinhey (1969); CHIMANIMANI MTN./ U.C.T. EXPEDITION/ II - 1958/ Nat. Museum/ S. Rhodesia. Transferred to *Africallagma* Kennedy, 1920 by May (2002: 404). Endemic to Chimanimani Mts; the male is easily identified by the almost triangular Fw Pt, which is more than twice as large as the Hw Pt.

*deningi* (*Pseudagrion*) Pinhey, 1961a: 28. — 6021; *Pseudagrion deningi* Pinhey/♂; HOLOTYPE ♂/ *Pseudagrion/ deningi*/ Pinhey n.sp.1960; LALE CHALI/ BANGWEULU/ N. Rhodesia/ 16-10-1959/ Nat. Museum, S.R.

Confined to swamps and rivers in NE Zambia, adjacent Katanga, and along the Okavango and Kwando Rivers in Botswana and Namibia; most likely also in Angola (Pinhey 1984; Suhling & Martens 2007). The male is unmistakable by the large, scoop-shaped cerci (Fig. 5b) and the dark, contrasting coloration without postocular spots and antehumeral stripes.

*dissimilis* (*Agrionemis*) d'Andrea & Carfi, 1997: 170. — [accession number unknown]; [envelope unknown]; [type label unknown]; Entebbe Uganda May. 1952 E. Pinhey; Paratype ♀ *Agrionemis aligulae* Pinhey 1973 [green label] [all data after d'Andrea & Carfi 1997].

The holotype was not found, although it was returned to NMBZ, as stated in a letter of receipt dated 02 v 1995 (M. d'Andrea in litt.). D'Andrea & Carfi (1997) synonymised *A. aligulae* with *A. maclachlani* (see *A. aligulae*), but described a paratype female as *A. dissimilis* and suggested it might pertain to the unknown female of a described species. *A. palaeforma* Pinhey (1959: 465. Nyenga, Uganda; BMNH) was thus far known only from the male holotype bred from a larva by P.S. Corbet (Pinhey 1974a). The type locality is near Jinja, ca 90 km NE of Entebbe. I examined a male from Naludugaru Swamp near Kyotera (20 ii 1995, P. Eryang, coll. P. Miller),

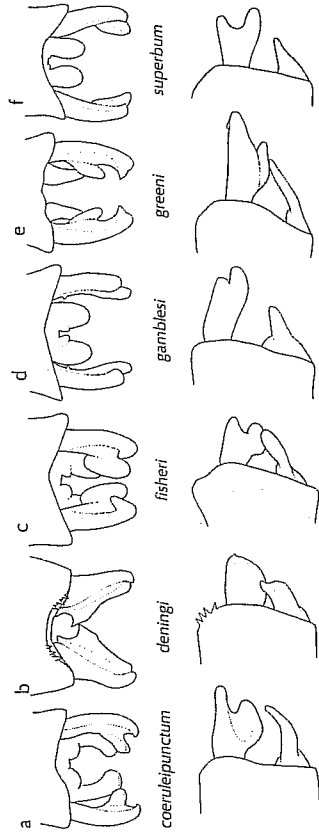


Figure 5: *Pseudagrion* male appendages in dorsal (above) and lateral views (below) — (a) *P. coeruleipunctum*; (b) *P. deningi*; (c) *P. fisheri*; (d) *P. gamblesi*; (e) *P. greeni*; (f) *P. superbum*.

and Eryang also reported it from Lake Nabugabo (C. Williams in litt.). Two females collected with males (Fig. 4d) in Ngoto Swamp on the border of Ewindi Impenetrable NP (22 v 2003, K.-D.B. Dijkstra, RMNH) are large (Hw 15 mm; usually 13-14 mm in *A. maclachlani*) and have the pronotal hindlobe as illustrated by d'Andrea & Carfi (1997). The *A. dissimilis* female has Hw 16 mm and similar markings (M. d'Andrea in litt.) [new synonymy]. All specimens at Ngoto sat among papyrus stems, ca 1 m above the water surface. The confinement of *A. palaeforma* to papyrus swamps explains the paucity and distribution of records. This habitat is extremely inaccessible, but widespread in Uganda, particularly in the Lake Victoria basin in which the type locality of *A. dissimilis* lies. Specific searches should produce new records. The species was indeed found to be abundant in papyrus swamps in Katonga GR, Lake Mburo NP and near Mityana (x-xi 2005, H.-J. Clausenitz unpubl.), where it was the dominant odonate. All records are still from Uganda.

*doulalae* (ssp. *Pseudagrion pseudomassaicum*) Pinhey, 1961b: 260. — 6123; *Pseudagrion pseudomassaicum/ dou[al]ae* Pinhey ♂; HOLOTYPE ♂/ *Pseudagrion/ pseudomassaicum/ dou[al]ae/ Pinh.* 1959; ½WAY DOU[AL]A-N'KONGSAMBA/ FRENCH CAMEROONS/ III - 1958/ Nat. Museum/ S. Rhodesia. Dark variety of *P. sublacteum* (Karsch, 1893).

*estesi* (*Pseudagrion*) Pinhey, 1971b: 2. — 5885; *Pseudagrion estesi* Pinhey/♂; Holotype ♂/ *Pseudagrion/ estesi* Pinhey/ 1970; Quimbango [= Zwimabango River]/ 200 S.E. of Malange/ ANGOLA/ 8-III-1970/ Nat. Museum/ S. Rhodesia/ leg. R.D. Estes.

Known only from two pairs in the type series (Pinhey 1971b).

*fisheri* (*Pseudagrion*) Pinhey, 1961a: 29. — 5979; *Pseudagrion fisheri* Pinhey/♂; HOLOTYPE ♂/ *Pseudagrion/ fisheri* Pinh./ 1960; MWINILUNGA/ N. Rhodesia/ 2 1960/ Nat. Museum, S.R.

Occurs scarcely in N Zambia, adjacent Angola and Katanga, and the Okavango Delta. The male is best identified by the orange face and unique appendages (Fig. 5c).

[*fugax* (form *Enallagma sinuatum*) Pinhey, 1962a: 899. — 3632; *Enallagma sinuatum fugax/ Pinhey/♂*; HOLOTYPE ♂/ *Enallagma/ sinuatum/ fugax/ Pinhey* 1961; BROKEN HILL/ N. Rhodesia/ V - 1961/ Nat. Museum, S.R.]

May (2002: 404) transferred *E. sinuatum* Ris (1921: 330. Kapi, Katanga, Congo-Kinshasa; MRAC) to *Africallagma*. This form described from Kabwe (formerly Broken Hill) in C Zambia and two sites in N Zambia, was reported by Pinhey (1966a) from near Nkhata Bay in N Malawi. I collected similar specimens together with typical *A. sinuatum* at two sites in N and C Malawi. These are distinct by their smaller size, paler coloration and sexual characters (Fig. 6) and closely match Pinhey's (1962a) illustrations of the appendages and description, including a dark "dot at ventral end of mesepisternum near mesothoracic collar" in the male. This dot marks the location in the female (which was unknown to Pinhey) of a short but distinct transverse ridge just behind the mesostigmal laminae; in the male this structure is weakly developed but retains the dark marking. No trace of such a structure exists in *A. sinuatum* or in any other *Africallagma*. This taxon is described as a new species in the appendix; published after 1961, the name '*fugax* Pinhey, 1962' is not available.

*gamblesi* (*Pseudagrion*) Pinhey, 1978a: 4. — 5611; *Pseudagrion* [crossed out: *gigas* Ris]/ *gamblesi* Pinhey/ ♂; Holotype ♂/ *Pseudagrion gamblesi*/ Pinhey, 1977; Bazely Bridge/ Umtali/ S. Rhodesia/ 10-XI-1965/ Nat. Museum/ S. Rhodesia.

Pinhey (1978a) separated *P. gamblesi* from *P. gigas* based on specimens from KwaZulu-Natal, Mozambique, Zimbabwe and Zambia (*gamblesi*) and Côte d'Ivoire and the Central African Republic (*gigas*), differing by the greater extent of thoracic black markings and the presence of a small internal tooth on the male cerci (Fig. 5d). Males of *P. gamblesi* from Zimbabwe (NMIKE), SW Ethiopia (06 - 17 iii 2004, V. Clausnitzer, K.-D.B. Dijkstra, RMNH) and NE South Africa (06 ii 2006, K.-D.B. Dijkstra, RMNH) are typically dark and large-toothed, but most specimens from Uganda and Kenya (NMIKE) have the antehumeral stripe almost as wide as the humeral stripe, a short metapleural stripe and the tooth so tiny that it is almost indiscernible. The observations suggest that the distinction between the two is not as clear-cut as Pinhey's widely disjoint specimens demonstrated and that the characters may vary clinally. The prothoracic stylets of *P. gamblesi* females, which are absent in *P. gigas*, may be a more reliable distinction.

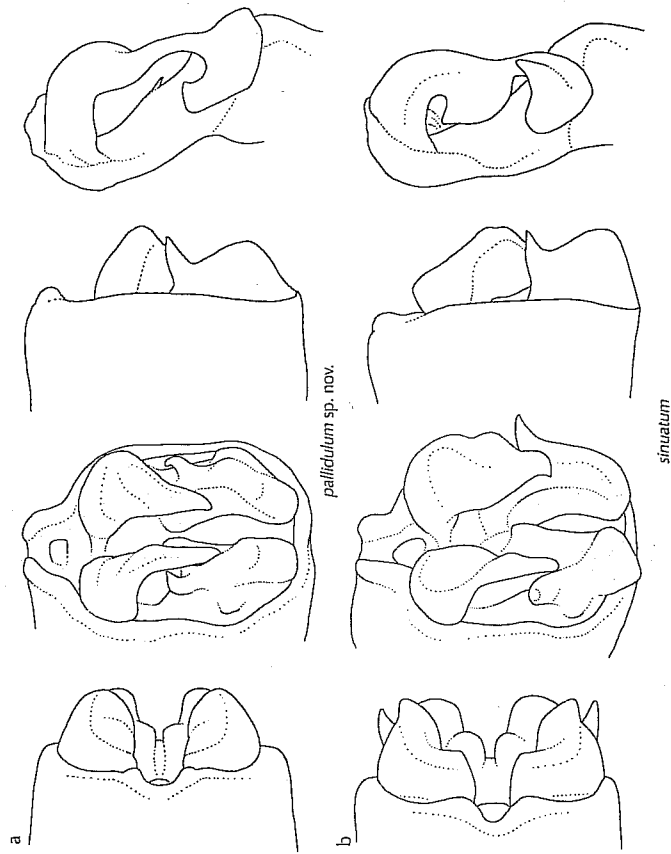


Figure 6: *Africallagma* male appendages in dorsal, caudal and lateral view, and penis in lateral view, from left to right — (a) *A. pallidulum* sp. nov.; (b) *A. sinuatum*.

*greeni* (*Pseudagrion*) Pinhey, 1961b: 260. — 5649; *Pseudagrion greeni*/ Pinhey/ ♂; HOLOTYPE ♂/ *Pseudagrion/ greeni*/ Pinh. 1959; 30 m S Ndola/ N. Rhodesia/ I 1959/ Nat. Museum/ S. Rhodesia.

Known only in the W Zambia-Karanga border region, from Ikelenge to Lubumbashi. The male is best identified by the yellow labrum, absence of postocular spots and massive appendages (Fig. 5e).

*greigi* (*Pseudagrion*) Pinhey, 1961b: 259. — 6719; *Pseudagrion greigi* Pinhey/ ♂; HOLOTYPE ♂/ *Pseudagrion/ greigi*/ Pinh. 1959; DINGILA UELE R./ BELGIAN CONGO/ II 1958/ Nat. Museum/ S. Rhodesia.

Junior synonym of *P. sjoestedti witteti* Fraser, 1949 (Pinhey 1964c: 83); a dark variety of *P. sjoestedti* Förster, 1906. See *P. sjoestedti pseudosjoestedti* for a discussion on the spelling of the species name.

*hilli* (*Ischnura*) Pinhey, 1964b: 329. — 3127; *Ischnura hillii* [sic] Pinhey/ ♂; Holotype ♂/ *Ischnura hillii* [sic]/ Pinhey 1962/ (nearest filosa); Alemaya Lake/ Dire Dawa/ ABYSSINIA/ 23-III-1962/ Nat. Museum/ S. Rhodesia/ B.G. Hill.

The synonymy with *I. abyssinica* Martin, 1907 found by Clausnitzer & Dijkstra (2005: 119) is confirmed. Two males in NMBZ labelled as possibly pertaining to that species are crushed and fairly pale examples of *I. senegalensis* (Rambur, 1842).

*karamoja* (ssp. *Aciagrion heterosticta*) Pinhey, 1972: 42. — 7052; *Aciagrion heterosticta/ karamoja* Pinhey ♂; Holotype ♂/ *Aciagrion heterosticta/ karamoja* ssp. nov./ Pinhey, 1971; Aremo Apr.1951/ Labwor Hills/ Karamoja Uganda/ T.H.E. Jackson.

The holotype is not conspecific with that of *A. heterosticta* Fraser (1955b: 19. Lubumbashi, Congo-Kinshasa; MRAC), but by appendages is close to *A. gracile* (Sjöstedt, 1909), *A. pinheyi* Samways, 2001 and the male from NE Congo-Kinshasa that Pinhey (1972) associated hesitantly with the female holotype of *A. hamoni* Fraser, 1955 from W Côte d'Ivoire (Figs 7c, d). The genus *Aciagrion* in general and this complex in particular requires revision (see *A. zambiensis*). Pending such treatment *A. karamoja* may be treated as a full species [new status]. Comparison of males assigned to the various taxa mentioned above (including a paratype of *A. pinheyi*, SUEC) revealed rather unappreciable differences in appendages, while the mesostigmal laminae are identical. Latter character was given greatest weight by Samways (2001), but the differences he saw rested on the poor illustrations by Pinhey (1972). Mainly the extent of black markings serves species identification, which is a weak basis considering variation. The dark smudges around the Pt of *A. pinheyi* are also present in *A. karamoja*.

*katamborae* (*Ceriagrion*) Pinhey, 1961a: 20. — 2620; *Ceriagrion katamborae* Pinhey/ ♂; HOLOTYPE ♂/ *Ceriagrion/ katamborae/ Pinhey* 1960; Katumbora [sic]/ Zambezi/ N. Rhodesia/ 7-X-1960/ Nat. Museum, S.R.; pt fw/ + extra x-vein. Confined to swamps in Zambia, N Botswana and NE Namibia (Okavango Delta) (Dijkstra 2005a; Suhling & Martens 2007).

*longispinum* (ssp. *Ceriatrion glabrum*) Pinhey, 1963a: 18. — 2098; *Ceriatrion glabrum longispinus* [sic] Pinhey/  $\sigma$ ; HOLOTYPE  $\sigma$ / *Ceriatrion/ glabrum/ longispinus* [sic]/ Pinh. 1961.; KETTA FOREST/ OUESSO SANGHA/ MOYEN CONGO/II - 1959/ Nat. Museum/ S. Rhodesia.

Represents the large variety of *C. glabrum* (Burmester, 1839) with yellow head, thorax and wings that predominates in the Guineo-Congolian forest areas (Dijkstra 2005a).

*macrooithenae* (*Aciagrion*) Pinhey, 1972: 37. — 7027; *Aciagrion macrooithenae* Pinhey/  $\sigma$ ; Holotype  $\sigma$ / *Aciagrion/ macrooithenae/* Pinhey, 1971; *Aciagrion/ LI-SOMBO River/ MWINILUNGA/ N. Rhodesia/ 22-V-1961/ Nat. Museum, S.R.* Known only in the W Zambia-Katanga border region, from Caianda in adjacent Angola to Lubumbashi. Identified by male appendages (Fig. 7e) and elongated ovipositor of female. Pinhey (1972) also separated the male from *A. gracile* by its "conical" mesostigmal ridges, but this is an exaggeration. The ridges are only slightly narrower and more pointed, and therefore appear triangular rather than semi-circular.

*malawiensis* (*Teinobasis*) Pinhey, 1966a: 5. — 1922; *Teinobasis malawiensis* Pinhey/  $\sigma$ ; Holotype  $\sigma$ / *Teinobasis/ malawiensis/* Pinhey 1966; *Mkuwadzi Forest/ Nkata Bay/ Malawi/ 11-V-1966/ Nat Mus, Bulawayo.*

Clausnitzer (2003a: 328) considered all *Teinobasis* populations from the Seychelles, Madagascar and eastern Africa as a single species with variable dark markings, *T. aliuandi* (Martin, 1896: 110 in *Telebasis*. Mahé, Seychelles; MNHN), but refrained from synonymising *T. malawiensis* because she only examined a female from the type series. That series represented the only continental record until she discovered the genus in coastal Kenya (Buda Forest) and Tanzania (Rufiji Delta, Pemba, Zanzibar) in 2001. The *T. malawiensis* holotype was compared directly with Buda and Zanzibar specimens and is undoubtedly conspecific. A recent topotypical *T. aliuandi* male (27 vi 1997, M.J. Samways, SUEC) is relatively small and dark, but does not differ morphologically [new synonymy].

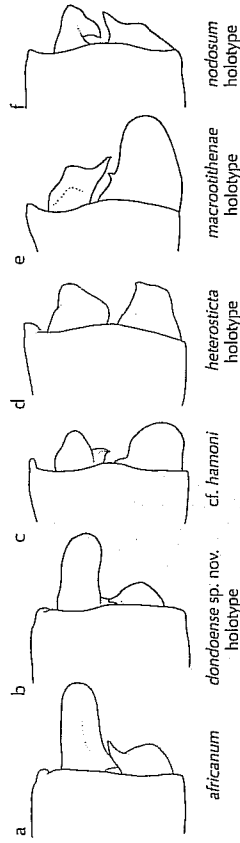


Figure 7: *Aciagrion* male appendages in lateral view — (a) *A. africanum*, Uganda; (d) *A. dondoense* sp. nov. holotype; (c) *A. cf. harmoni*, Benin (holotype *karamoja* is similar); (d) *A. heterosticta* holotype; (e) *A. macrooithenae* holotype; (f) *A. nodosum* holotype.

*mourae* (*Ceriatrion*) Pinhey, 1969b: 3. — 2611; *Ceriatrion mourae* Pinhey/  $\sigma$ ; HOLOTYPE  $\sigma$ / *Ceriatrion/ mourae/* Pinhey, 1969; *Mamunge/ Mocambique/ 18-VIII-1964/ Nat. Museum/ S. Rhodesia/ leg. A.R. MOURA; Mamunge/ coll. A. MOURA, 18/8/64.*

Records from E Tanzania are the first since description (Dijkstra 2005a).

*mozambicensis* [sic] (*Pseudagrion*) Pinhey, 1962a: 894. — 5683; *Pseudagrion mozambicensis* [sic]/ Pinhey/  $\sigma$ ; HOLOTYPE  $\sigma$  in Cop/ *Pseudagrion/ mozambicensis* [sic]/ Pinh. 1961; *Dondo Forest/ Port. E. Africa/ XII - 1960.* Treated as an orange-faced form of *P. glaucescens* Selys, 1876 by Pinhey (1964c: 74); correct spelling is *mozambicensis*.

*newtoni* (*Pseudagrion*) Pinhey, 1962a: 895. — 5892; *Pseudagrion newtoni* Pinhey/  $\sigma$ ; HOLOTYPE  $\sigma$ / *Pseudagrion/ newtoni/* Pinh. 1961; *NQUTU/ Zululand/ Natal/ 18 III 1961/ Nat. Museum, S.R./ A.H. Newton.* Small relative of *P. hageni*; endemic to NE South Africa (Samways 1999).

*nodosum* (*Ischnuragrion*) Pinhey, 1964a: 105. — 7072; *Ischnuragrion nodosum* Pinhey/  $\sigma$ / face po. spots, thor + base/ of abd. emerald, 8-10 cobalt.; *Holotype*  $\sigma$ / *Ischnuragrion/ nodosum/* Pinhey 1963; *Chinyagi River/ MWINILUNGA/ N Rhodesia/ 6-V-1963/ Nat. Museum, S.R.*

Transferred to *Aciagrion* by Pinhey (1972: 46). A relatively dark species with characteristic appendages (Fig. 7f) known only from N Zambia.

[*planiranum* (form *Pseudagrion helena*) Pinhey, 1964c: 96. — 5019; *Pseudagrion planiranum/* Pinhey  $\sigma$ / 150 D; HOLOTYPE  $\sigma$ / *Pseudagrion/ planiranum* [sic]/ Pinhey i.l./ 1962; *LUWINGU/ N. Rhodesia/ 16-III-1961/ Nat. Museum, S.R.*] Dark variety of *P. helena* Balinsky, 1964.

*pseudosjostedti* [sic] (ssp. *Pseudagrion sjostedti* [sic]) Pinhey, 1964c: 88. — 6633; *Pseudagrion sjostedti/ pseudosjostedti* Pinhey  $\sigma$ ; HOLOTYPE  $\sigma$ / *Pseudagrion/ sjostedti/ pseudosjostedti/* Pinh. 1962; *HOLDENBY/ PUNGWE-HONDE/ GORGES/ INYANGA/ XI - 1956/ S. RHODESIA; Nat. Museum/ S. Rhodesia.*

Pale variety of *P. sjostedti* Förster, 1906; corrected spelling is *pseudosjostedti*. According to Art. 32.5.2.1 of the Code (International Commission on Zoological Nomenclature 1999) the species group name *sjostedti* should be transcribed as *sjostedi* because Sjöstedt was Swedish (and not German). Bridges (1994) emended the spelling accordingly, but this has not been generally accepted. An internet search, which reflects recent usage in the literature, revealed 193 references to *P. sjostedti* versus only six for *P. sjostedi*. "A substantial majority of the most recent authors is considered as prevailing usage in the Glossary of the Code and the incorrect subsequent spelling *sjostedti* is to be preserved, following Art. 33.3.1 of the Code. Authors have matched the spelling of *pseudosjostedti* with the prevailing usage of *sjostedti*; therefore the same argument applies there too.

*quadricolatum* (*Pseudagrion*) Pinhey, 1964c: 34. — 5322; *Pseudagrion quadricolatum* Pinhey/  $\sigma$ ; HOLOTYPE  $\sigma$ / *Pseudagrion/ quadricolatum/* Pinhey 1962; *Bambesa/ central CONGO/ IX - 1938/ Nat. Museum/ S. Rhodesia; P. kersteni*  $\sigma$ / *Bambesa, Belg./ Congo. ix.38./ det. Fraser.195[?].*



Clearly distinct by the green thoracic coloration from the orange-marked nominotypic taxon *hageni* Karsch, 1893, which is confined to coastal Western and Eastern Cape, while *tropicatum* occurs in a large part of S and E Africa from KwaZulu-Natal north. The possibility of both taxa being good species must be investigated.

*umbargae* (*Argiocnemis*) Pinhey, 1970a: 1. — 4472; *Argiocnemis umbargae* Pinhey/♂; Holotype ♂/ *Argiocnemis/umbargae* Pinhey/1970; Mbalmayo/ CAMEROONS/1969/ Nat. Museum/ S. Rhodesia/ leg. A-R. Mbarga.

The synonymy with *Ceriatrion annulatum* Fraser, 1955 found by Dijkstra (2005a: 5) is confirmed.

*williamsi* (*Pseudagrion*) Pinhey, 1964b: 327. — 4780; *Pseudagrion williamsi* Pinhey/♂; *Pseudagrion/ williamsi* Pinhey 1962./ HOLOTYPE ♂; Kabompo. R./ MWINILUNGA/ N. Rhodesia/ III 1960/ Nat. Museum, S.R.

All characters provided by Pinhey (1964b, c) to separate *P. williamsi* from *P. inconspicuum* Ris, 1931 are differences between the latter and *P. kersteni* (Getstackel; 1869: 222 in *Agrion*. Mbaramu, East Africa; ZMHB). The holotype and paratype males of *P. williamsi* agree with *P. kersteni* in size, coloration (including pruinosity pattern) and appendages [new synonymy]. All males identified as *P. williamsi* in NMBZ lack the antehumeral stripe typically seen in *P. kersteni* (marked by pruinosity in older individuals), but some *P. kersteni* in the collection have a similar condition. This may be an artefact of preservation or a variation related to increased melanisation in '*williamsi*'.

[*zambeziensis* [sic] (form *Pseudagrion glaucescens*) Pinhey, 1964c: 73. — 5691; *Pseudagrion glaucescens* Selys/ f. *zambeziensis* [sic] Pinhey ♂; Holotype ♂/ *Pseudagrion/ glaucescens* Selys/ f. *zambeziensis* [sic]/ Pinhey; Victoria Falls/ Rhodesia/ IV - 1962/ Nat. Museum, S.R.]

Dark variety of *P. glaucescens* Selys, 1876; correct spelling is *zambeziense*.

*zambiense* (*Aciagrion*) Pinhey, 1972: 23. — 6903; *Aciagrion zambiense* Pinhey/♂; Holotype ♂/ *Aciagrion zambiense*/ Pinhey, 1971; Zambezi Source/ Mwinilunga/ ZAMBIA/ 24-V-1964/ Nat. Museum/ S. Rhodesia/ R.C. Denning/ 228/ D; Denning 228D [penis glued on] prophall[us].

Known only from the holotype and a male from Caianda, Angola (also in NMBZ), collected at most 95 km further west. The allotype female of *A. zambiense* cannot be associated with the holotype. It is general, was not collected at the same time or place, and the described distinguishing features cannot be discerned; at least six *Aciagrion* species occur in the vicinity.

Pinhey (1972: 25) reported a similar species from Dondo, near Beira on the Mozambique coast, as the reinstated *A. congoense* (Sjostedt, 1917: 15 in *Mombagrion*. Kingoyi, Congo-Brazzaville; NHRS). Schmidt (1951a) synonymised that taxon with *A. africanum* Martin (1908: 659. Guinea-Bissau; MCSN), after Fraser (1946) realised that *A. congoense* and *Pseudagrion pseuderythrogramma* Schmidt in Ris, 1936 were identical and described from syntopic specimens, although in different genera. Pinhey (1963b) examined the *A. congoense* holotype, confirming Fraser's view and stating it was "near *A. africanum*", but later Pinhey (1972) dismissed Schmidt's synonymy of *A. congoense* because "recent examination of Sjostedt's type indicates quite

[*rusingae* (form *Pseudagrion pseudomassaicum*) Pinhey, 1956: 22. — 6130; *Pseudagrion pseudomassaicum*/ f. *rusingae* Pinhey/♂; HOLOTYPE ♂/ *Pseudagrion/ pseudomassaicum*/ f. *rusingae*/ Pinh. 1956; Rusinga Isl./ L. Victoria/ III 1950/ Nat. Museum/ S. Rhodesia.]

Small, dark variety of *P. sublacteum* (Karsch, 1893).

*sakeji* (*Ceriatrion*) Pinhey, 1963a: 21. — 2553; *Ceriatrion sakeji* [sic] Pinhey/♂; *Ceriatrion sakeji* [sic]/ Pinhey/ holotype ♂ [second envelope]; HOLOTYPE ♂/ *Ceriatrion/ sakeji* [sic]/ Pinh. 1962; MWINILUNGA/ N. Rhodesia/ II 1960/ Nat. Museum, S.R.

The holotype was examined by Legrand (1984) and still remains in MNHN (J. Legrand, K. Schütte in litt. iii 2006). Taxonomic status deserves further study (Martens et al. 2003; Dijkstra 2005a).

*samfayae* (ssp. *Pseudagrion coelestis* [sic]) Pinhey, 1964c: 95. — 4937; *Pseudagrion coelestis* [sic]/ *samfayae* Pinhey/♂; Holotype ♂/ *Pseudagrion/ coelestis* [sic]/ *samfayae* Pinh./ ssp. 1962; SAMFYA/ N. Rhodesia/ 4 1959/ Nat. Museum/ S. Rhodesia.

Dark variety of *P. coeleste* Longfield, 1947.

*spatulae* (ssp. *Argiocnemis angolensis*) Pinhey, 1974a: 256. — 4450; *Argiocnemis angolensis/ spatulae* Pinhey/♂; Holotype ♂/ *Argiocnemis/ angolensis spatulae*/ ssp. nov./ Pinhey, 1973; IKELENGE Swamp/ MWINILUNGA/ ZAMBIA/ 24-I-1965/ Nat. Museum/ S. Rhodesia.

The differences described with the nominotypic taxon *angolensis* Longfield, 1947 appear exaggerated (Fig. 4a).

*transvaalica* (ssp. *Argiocnemis falcifera*) Pinhey, 1974a: 213. — 4272; *Argiocnemis falcifera/ transvaalica* Pinhey/♂; Holotype ♂/ *Argiocnemis falcifera transvaalica/ subsp. nov.*/ (Pinhey, 1973); Woodbush/ Haenertsberg/ N. Transvaal/ SOUTH AFRICA/ XII - 1966/ Nat. Museum/ S. Rhodesia.

Small inland variety of *A. falcifera* Pinhey, 1959.

*tropicatum* (ssp. *Pseudagrion hageni*) Pinhey, 1966b: 290. — 5793; *Pseudagrion hageni tropicanum*/ Pinhey/♂; Holotype ♂/ *Pseudagrion hageni/ tropicanum*/ ssp. nov./ E. Pinhey, Lubudi/ KATANGA/ B. CONGO/ II 1960/ Nat. Museum/ S. Rhodesia.

[*coeruleocauda* (form *Chlorocnemis nigripes*) Pinhey, 1969a: 252. — 12266; *Chlorocnemis nigripes* f. *coeruleocauda*/Pinhey ♂; Holotype ♂/Chlorocnemis nigripes/ f. *coeruleocauda*/Pinhey, 1968; KELLE FOREST/MOYEN CONGO/ X - 1963/ Nat. Museum/ S. Rhodesia.]

Differs from typical *C. nigripes* Selys, 1886 by the blue (not orange) postocular spots and S8-10 dorsum (Fig. 8e). Pinhey (1969a) suggested that "this may or may not be abnormal in development". Typical mature males were collected near Lokutu, Congo-Kinshasa, along with a single teneral male with blue postocular spots and abdomen tip (30 x 06 xi 2004, K.-D.B. Dijkstra, RMNH). Two of Pinhey's *coeruleocauda* specimens were "very teneral", two others (including the holotype) had clear (not yellow) wings suggesting they were immature. Pinhey also mentioned a teneral Cameroon male with blue terminal segments and it seems a colour change takes place during maturation.

[*impedita* (form *Chlorocnemis marshalli*) Pinhey, 1969a: 241. — 1131; *Chlorocnemis marshalli impedita*/ Pinhey ♂; Holotype ♂/ Chlorocnemis marshalli/ f. *impedita* Pinhey, 1968; Vumba Mts/ Umtali/ S. Rhodesia/ XI - 56.]

Described as a dark form of *C. marshalli* Ris, 1921 differing from 'typical' *marshalli* by its narrower blue frontal band and antehumeral stripes (Figs 8b, c). The lectotype of *C. marshalli* (BMNH) — designated Pinhey 1962c: 104; see Kimmins 1970: 177) is equally dark, and thus the name *impedita* is redundant. Furthermore, published after 1961, '*impedita* Pinhey, 1969' is not an available name.

*lascellesi* (*Chlorocnemis*) Pinhey, 1961a: 14. — 1087; *Chlorocnemis lascellesi* Pinhey ♂; HOLOTYPE ♂/ Chlorocnemis/ lascellesi. Pmh./ 1960; MWINILUNGA/ N. Rhodesia/ II 1960/ Nat. Museum, S.R.

Junior synonym of *C. wittei* Fraser, 1955 (Pinhey 1969a: 236).

*maccleeryi* (ssp. *Chlorocnemis montana*) Pinhey, 1969a: 245. — 1190; *Chlorocnemis montana maccleeryi*/ Pinhey ♂; Holotype ♂/ Chlorocnemis/ montana maccleeryi/ Pinhey 1968; Ncluisi Mt 5,200' [1,580 m a.s.l.]/ central Prov./ MALAWI/ 4-III-1967/ Nat. Museum/ S. Rhodesia/ Leg. Dr. C.H. McCleery.

Differs from nominotypic *C. montana* St. Quentin (1942: 108. Lupembe, Tanzania; NMW) by the larger size (Hw 25.7 mm), longer paraprocts than cerci (rather than shorter), yellow-centred black labrum (not all-blue) and all-black tibiae (anterior sides not blue) (Figs 8a, d). It is therefore similar to *C. abbotti* (Calvert, 1892), but that species typically is smaller (Hw 21-25 mm) and has an all-black labrum, although four *C. abbotti* males from Langenburg (ZMFB; including the *C. inepta* Grünberg, 1902 holotype) have yellow-centred labrums also. The long penial lobes are also similar, but a topotypical male (14 xii 2001, R. Murphy, RMNH) confirms the distinctly falcate shape of the lateral processes of these lobes, which are rounded in *C. abbotti* (cf. figs 7g, 14f in Pinhey 1969a). *C. maccleeryi* can best be treated as a distinct species near *C. abbotti* [new status] confined to Mt Nichisi, central Malawi. At most 250 ha of forest at 1,350-1,650 m a.s.l. remain here (Dowsett-Lemaire 1989) and the species may be critically endangered. True *C. montana* is known only from the type locality at 1,800-2,000 m a.s.l. in the mountains W of Songea in S Tanzania, and specimens collected at 1,830 m a.s.l. in the Mughese Forest,

direction of the basal tooth of the paraprocts: dorsad in '*congoense*' (Fig. 7b) and dorso-posterior in '*africanum*' (Fig. 7a). As illustrated by Sjøstedt (1917) and Pinhey (1963b), the *A. congoense* holotype and three topotypical males (NHRS) demonstrate the '*africanum*' condition. The same applies to a series from Budongo Forest in BMNH published by Longfield (1936) as *A. congoense*. Both Schmidt (1951a) and Pinhey (1972) examined Martin's series of '*A. africanum*' in MNHN, but not the type series in MCSN. This contains three males and five females collected at Bolama (15-25 xi 1899, L. Fea) and one female from Bissau (30 xii 1898, L. Fea), all in Guinea-Bissau. All males have '*africanum*' appendages (R. Poggi in litt. 09 viii 2006), confirming the synonymy of *A. congoense* with *A. africanum* and leaving Pinhey's Dondo species unnamed.

Males from Pemba Island, Tanzania (*A. cf. zambianse* in Dijkstra et al. 2007) and NE KwaZulu-Natal (*A. cf. zambianse* in Samways 2006a, b) are conspecific with the Dondo specimens. These males are darker overall than the *A. zambianse* holotype and their cerci are longer with a broader apex and a smaller, more basal ventral tooth (Fig. 7b; Pinhey 1972). The Caianda male of *A. zambianse* is intermediate in coloration, but the somewhat distorted cerci appear similar to those of the holotype. The difference in the cerci, though slight, supports Pinhey's recognition of a distinct species from the eastern coast (see appendix).

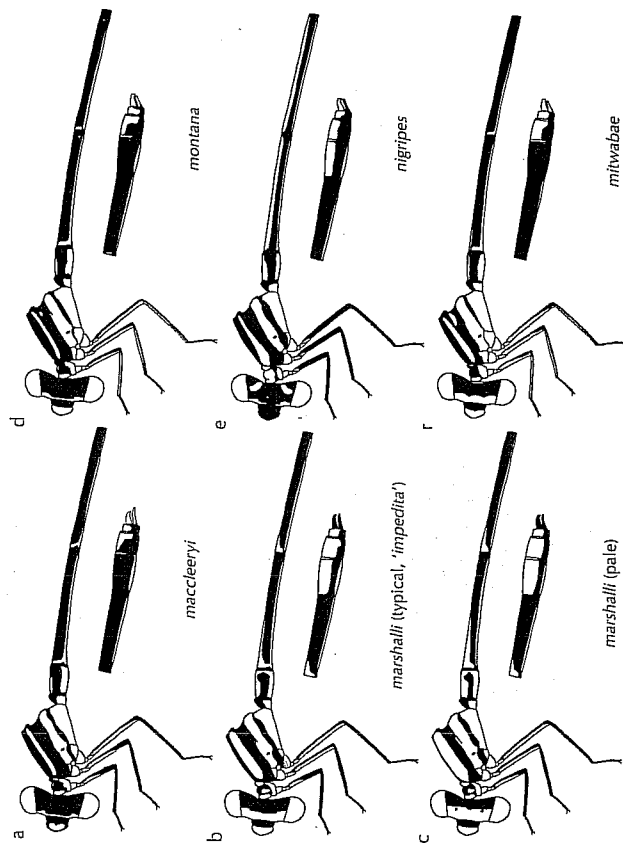


Figure 8: *Chlorocnemis* and *Alloccnemis* male head in dorsal view and thorax, S1-4 and S7-10 in lateral view — (a) *C. maccleeryi*; (b) *C. marshalli* typical (dark) variety ('*impedita*'); (c) *C. marshalli* pale variety; (d) *C. montana*; (e) *C. nigripes*; (f) *A. mitwabae*.

in Malawi (Ochi 2001, A. Murphy, KMINF). Geographically its range around the N SW Tanzania to SE Kenya. Malawi *C. montana* has short penial lobes with falcate lateral processes, while Schmidt's (1951c) figure 10n of Tanzanian *C. montana* (reproduced by Pinhey (1969a: fig. 13) shows lobes like *C. abboti*, and his fig. 10l of *C. abboti* from Langenburg lacks the lateral processes altogether. Possibly the systematics of *Chlorocnemis* in S Tanzania are more complex than hitherto believed.

*mitwabae* (*Alloccnemis*) Pinhey, 1961b: 258. — 1695; *Alloccnemis mitwabae* Pinhey/♂; HOLOTYPE ♂/ *Alloccnemis/ mitwabae*/ Pinh. 1959; MITWABA/ BELGIAN CONGO/ I 1958/ Nat. Museum/ S. Rhodesia.

Known only from near Mitwaba and Lubudi, on opposite ends of PN Upemba in Katanga (Pinhey 1961a), and distinctive yellow coloration (orange in life?) not previously illustrated (Fig. 8f). The close relationship between *Alloccnemis* Selys, 1863 (i.e. *A. leucosticta* Selys, 1863) and *Chlorocnemis* Selys, 1863 demonstrated by Cowley (1936) and Schmidt (1951c) was lost in a classification based only on the length of the anal vein (see Fraser 1957): *Chlorocnemis* was placed in Protoneturidae for its abbreviated vein, while *Alloccnemis* remained in Platycnemididae. The resemblance between the two genera is apparent in other venation features, sexual characters, coloration (including the yellow wings of males) and genetics (K.-D.B. Dijkstra, F. Stokvis unpubl.). *A. leucosticta* differs in its swollen, white Pt, but *A. mitwabae* is essentially an '*Alloccnemis* with *Chlorocnemis* Pt' or a '*Chlorocnemis* with *Alloccnemis* anal vein'.

*phoenix* (*Oreocnemis*) Pinhey, 1971a: 2. — 1910; *Oreocnemis phoenix* Pinhey/ ♂; Holotype ♂/ *Oreocnemis/ phoenix*/ Pinhey, 1971; Lirtle Ruo path, 6000'/ Mt M[ujlanje/ MALAWI 14-XII-1970/ Nat. Museum/ S. Rhodesia. Endemic to the plateau of Mt Mulanje, Malawi (Parr 1983; Pinhey 1971a) and abundant there, but could not be found in other highlands in Malawi and adjacent Mozambique, where suitable habitat appears to be largely absent (Dijkstra 2004). The genus has no obvious relatives, its appendages and markings are unique in Africa (Fig. 9).

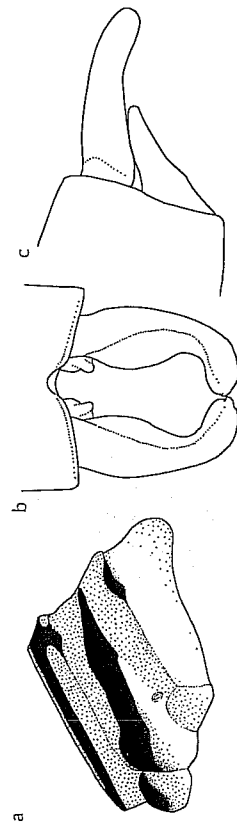


Figure 9: *Oreocnemis phoenix* male — (a) synthorax in dorsal view; (b) appendages in dorsal view; (c) appendages in lateral view.

*rossii* (ssp. *Chlorocnemis nubilipennis*) Pinhey, 1969a: 257. — 1267; [pinned, no envelope text]; HOLOTYPE ♂/ *Chlorocnemis/ nubilipennis/ rossii* Pinhey, 1969/ det. K.-D B Dijkstra/ 14 February 2006; Sierra Leone/ 1907 from/ J.C. Thompson; Det. E.C.G. Pinhey, 1965/ *Chlorocnemis/ nubilipennis/ ♂* Karsch; abd incomplete.

Not listed by Hancock et al. (1995), the present specimen is obviously the holotype by labels and appearance. Carfi & d'Andrea (1994: 142) considered *C. nubilipennis* Karsch, 1893, including *C. n. rossii*, a junior synonym of *C. flavipennis* Selys, 1863. Apparently without examining holotypes, Legrand (2003: 235) separated *C. rossii* as a smaller and paler lowland counterpart of *C. flavipennis*, with slight morphological differences. The *rossii* holotype fits Legrand's diagnosis by its size (Hw 16 mm), complete frontal stripe, fairly pale labium, wing colour and penis shape, but features of the male appendages (lost) and female pronotum (wrong sex) cannot be examined. Size and coloration vary extremely in long series of *C. flavipennis* from Ghana and Liberia (RMNH), as does the relative length of the paraprocts to some degree, but none of the specimens match *C. rossii* sensu Legrand. Considering that W Africa is mostly low-lying, it is unexpected to find *C. flavipennis* (Legrand's highland taxon) to predominate there. Moreover, the character states that should separate the two taxa and link Legrand's taxon to the present holotype, occur in variable combinations. Carfi & d'Andrea (1994) also described strongly mixed but correlated features in their Sierra Leone specimens: "The hyaline and laescent [wing] apex is always associated with a paler and more luminous yellow body while the dark amber apex occurs with a darker yellow body and twice is associated with a slight pruinosity of the femora." Possibly, aside from regional and individual variation, the wings become deeper amber with age, losing their clear tip, while body markings blacken or deepen in colour and penis lobes become more chitinised. In conclusion it appears that Legrand compared extreme examples of a single variable species, and even if multiple taxa exist, these cannot be coupled to the available type specimens on account of this variation.

*semilikiensis* (ssp. *Chlorocnemis nigripes*) Pinhey, 1969a: 252. — 1220; *Chlorocnemis nigripes semilikiensis*/ Pinhey/ ♂; Holotype ♂/ *Chlorocnemis/ nigripes/ semilikiensis*/ Pinhey 1968; Bwamba Forest 2400ft/ Fort Portal Uganda/ April 1951/ E. Pinhey.

Size variation in the genus can be marked and *semilikiensis* cannot be considered as more than a somewhat small variation of *C. nigripes* Selys, 1886 (Hw 20.7 mm).

#### Protoneturidae

*flavifacies* (*Prodasinieura*) Pinhey, 1981: 70. — 1619; *Prodasinieura flavifacies* Pinhey/ ♂/ (proph[allus]); Holotype ♂/ *Prodasinieura flavifacies/ spec. nov./* Pinhey, 1980; KALLA FARM-swamp/ KELENGE/ MWNILUNGA/ ZAMBIA/ 20-I-1965/ Nat. Museum/ S. Rhodesia.

The collection details of the holo- and allotype in the description (Pinhey 1981) and on their labels are interchanged. The allotype's label reads: "Lisombo River/ Mwinilunga/ N. Rhodesia/ IV - 1963/ Nat. Mus.S.R." This agrees with details of a female described by Pinhey (1964a) as *Elattonieura acuta* (nec Kimmins, 1938), while the described male collected at Kanyita stream in March 1963 is now a paratype of *P. flavifacies*. Because these three are the only specimens known and the second male must have been collected after 1964, the error was probably made in Pinhey's (1981)

paper, not in the labelling. Lindley (1976) already noted that Pinhey (1964a) did not describe the true *E. acuta*, but Pinhey (1981) did not refer to his prior description of *P. flavifacies*. A single female from Kapanga, 350 km NW of the type locality in Katanga, in MRAC with the anal vein sloping down well before the distal border of the quadrilateral cell, a narrow antehumeral stripe on two-thirds of the mesepisternum, a warm yellowish wash to the pale thoracic colours and two narrowly separated rectangular pronotal lobes (broad but not deep) that conceal a small second pair of lobes agrees with the allotype and represents the first record since its publication. Illustrations of the holotype are provided (Figs 10a, b).

Pinhey (1981) concluded that "variation in the length of the anal vein suggests that *Prodasineura* is probably ... a subgenus of *Elattonneura*." As *Prodasineura* predates *Elattonneura* and is predominantly Asian (including the type species), that solution is too simple (Dijkstra 2003b). In typical *Elattonneura* the anal vein is fairly straight and terminates on the cross-vein that is aligned with the distal border of the quadrilateral cell, but in typical *Prodasineura* it is absent or curves to the wing's posterior border well before this cross-vein. However, in '*E. girardi*', '*E. morini*', '*P. flavifacies*' and '*P. incerta*' the vein gradually nears the posterior border and fuses with it at or just before the cross-vein (Pinhey 1962b; 1981; Legrand 1985; own observations). This indicates that variation in the vein's length is not bimodal; moreover the character is inconsistent in *Prodasineura* by definition: in Oriental species the anal vein may even be completely absent. The Afrotropical ('*Elattonneura*') and Oriental ('*Prodasineura*') species may represent two separate radiations, with venational parallels achieved by convergence. Approximately 70 species are known in the complex, assigned almost evenly to the two genera, but two-thirds of the species are Asian. A survey of 40 species (RMNH) not only revealed how variable the anal vein length is, but also that 35 species could be assigned to the correct continent by a combination of geographically unique characters. African species are often marked with pruinosity, while Asians are often blue. The distal border of the paraproct is distinctly vertical in Africa, but tends to slope in Asia. A completely reduced anal vein is confined to Asia. Further study of the status of these genera and the probably synonymous genus *Arabineura* Schneider & Dumont, 1995 is required.

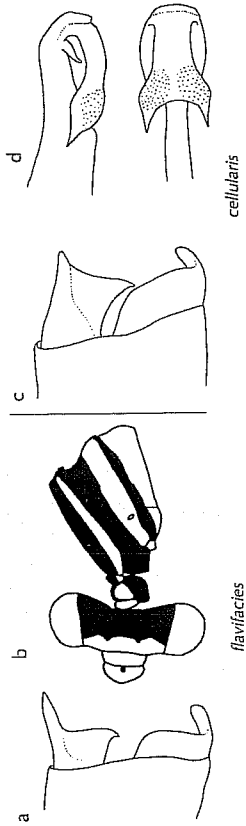


Figure 10: *Prodasineura flavifacies* (a, b) and *Elattonneura cellularis* (c, d) males — (a) holotype, appendages in lateral view; (b) holotype, head in dorsal, thorax in lateral view; (c) appendages in lateral view; (d) penis in lateral (above) and ventral (below) view.

*incerta* (*Prodasineura*) Pinhey, 1962b: 23. — 1366; *Prodasineura incerta* Pinhey/ ♂ HOLOTYPE ♂/ *Prodasineura*/ *incerta*/ Pinh. 1960; Etoumbi Forest/ MAKOUA/ MOYEN CONGO/ VIII - 1960/ Nat. Museum/ S. Rhodesia.

Named for its uncertain generic position (see *P. flavifacies*) and placed in *Elattonneura* by Aguesse (1966: 785) without comment. Males of other African '*Prodasineura*' share contrasting white, yellow or orange facial and thoracic markings, while most *Elattonneura*, like '*P. incerta*', are pruinose. A male from Eala and three females from Busu-Bombenga and Dongo (both near Kungu) in MRAC agree with Pinhey's and Aguesse's information. These are the first records outside Congo-Brazzaville, although the sites lie close to the border in NW Congo-Kinshasa. The females have the pronotal hindlobe slightly constricted sublaterally and bearing a large and entire central lobe, and an almost unmarked mesepisternum, save a small whitish spot in its extreme antero-ventral corner. Other African protonereid females have the lobe deeply excavated medially, with a single or double lobe on each side of this excavation, and mesepisternal markings more developed.

*tropicalis* (*Elattonneura*) Pinhey, 1974b: 1. — 1468; *Elattonneura frenalata*/ *tropicalis* Pinhey ♂; Holotype ♂/ *Elattonneura frenalata*/ *tropicalis*/ Pinhey, 1970; Victoria Falls/ Rhodesia/ II - 1957/ Nat. Museum, S.R.; prophallus.

*Disparoneura cellularis* Grünberg (1902: 232. Langenburg [= Lumbiral, Tanzania; ZMHB] was "referred with some doubt to *Isomecocnemis*" by Cowley (1936: 516, 518). Pinhey (1963b: 146) agreed, although he first considered it an *Elattonneura* (Pinhey 1962a). The damaged holotype is quite juvenile, but belongs to *Elattonneura* by venation, Pt shape, markings and facial pruinosity. It lacks appendages, but the penis (Fig. 10d) shows it is conspecific with *E. tropicalis* [new synonymy]. Additional specimens of this species from the Langenburg area (ZMHB) were reported by Grünberg (1903) as *D. mutata* (nec Selys, 1886).

#### APPENDIX: SPECIES DESCRIPTIONS

*Acigrion dondoense* sp. nov.  
(Fig. 7b)

*Acigrion congoense* nec (Sjöstedt, 1917) — Pinhey (1972: 25, fig. 3a-l).  
*Acigrion* cf. *zambianse* Pinhey, 1972 — Samways (2006a: 352, 2006b: 211, plate 2); Dijkstra et al. (2007: 192).

#### Etymology

Although the holotype is from Pemba, the species is named after the site of Pinhey's specimens, because of the similarity of the names *dondoense* and *congoense*.

#### Specimens studied

Holotype ♂: Tanzania, Pemba Island, Ngezi Forest (4°56'16.6"S, 42°38'38.6"E; alt. 38 m a.s.l.), 08 x 2001, leg. V. Clausnitzer, RMNH. — 10 ♂, 1 ♀: Mozambique, Dondo, xii 1960; 26 x 1963, 04 xi 1967; 24 v 1969, leg. E. Pinhey, NMBZ. — 13 ♂, 3 ♀: South Africa, KwaZulu-Natal, Cape Vidal, Mfabiweni Swamp (28°08'S, 32°32'E; alt. 12 m a.s.l.), 22 ii 2001, leg. M.J. Samways, SUEC.

The male has the basal tooth of the paraprocts directed straight upwards and rather long cerci with a comparatively broad apex and a small, basal ventral tooth (Fig. 7b). See *A. zambiensis* (above) and Pinhey (1972) for further details, although differences in markings are probably unreliable. *A. dordoiense* sp. nov. is only known from the three coastal sites listed above, where no similar species occur. *A. zambiensis* is only known from NW Zambia and adjacent Angola, *A. africanum* occurs from N Zambia, N Malawi and W Uganda to western Africa (Pinhey 1972, personal observations). The latter has the tooth on the paraprocts slanting backwards (Fig. 7a).

#### Description of holotype male

Preserved dry, in envelope. In good condition; greyish colour is probably pale blue in life.

**Head:** Labium and genae pale brown; rest of head pale blue-grey with very limited blackish markings as follows: small central spot at base of labrum; pair of tiny spots in depressions on postclypeus; small central spot on antefrons at base of postclypeus; narrow central crescent in depression on frons between antennae; anterior ocellus flanked laterally by pair of small spots and posteriorly by central spot; each lateral ocellus flanked internally by narrow longitudinal bar that merges with a transverse bar behind the full breadth of the vertex; postocular area demarcated by narrow, interrupted bars anteriorly and posteriorly.

**Thorax:** Prothorax pale blue-grey, marked with narrow blackish markings. Synthorax pale blue-grey with very few markings: middorsal carina flanked over full length by blackish hair-lines that widen somewhat posteriorly and connect anteriorly to a pair of black spots that lies against the mesostigmal laminae; sharp black spots in fossae of humeral and metapleural sutures, the humeral spot connected by a black hair-line through the suture to a dark brown bar dorsally on mesokatepisternum; thin brownish line in interpleural suture that does not surpass the spots in the fossae; small round, isolated blackish spot antero-dorsally on mesepimeron, below anterior bend of humeral suture. The humeral hair-line is flanked by slight brown smudging. Each mesostigmal lamina dorsally with low, short ridge running to posterior border. Synthoracic venter brownish white. Legs brownish white except for small black spots on exterior surface of each femoral apex, very narrow dark apical edgings to tibiae and tarsal segments, and black tips of claws.

**Wings:** Clear; venation brown; Pt pale brown with narrow pale margin, less than one cell long, rhomboidal with anterior and posterior borders equal in length, distal and proximal borders about as long as anterior border in Fw, slightly shorter in Fw. 11 Px in both Fw, 10 in both Hw.

**Abdomen:** S1-2 broadly pale grey-blue laterally, S3-7 progressively less pale laterally; dorsa of all these segments blackish over entire length, S1-2 fairly broadly so, narrowing abruptly at apex of S2; narrow at base of S3 and then gradually widening towards apex, expanding abruptly to form an apical black ring; S7 largely dark; S4-6 showing intermediate development of markings. S8-10 wholly pale blue; apical margins of S8-9 very narrowly black laterally; basal margin of S10 narrowly black dorsally, its apical margins narrowly black dorsally and laterally. Cerci blackish

throughout, about as long as S10, diverging in dorsal view, shaped as in Figure 7b with broad rounded tip and small basal tooth just visible beyond apical margin of S10. Paraprocts brown and inconspicuous with tip of blackish dorsal tooth parallel to and more or less eclipsed by margin of S10 (drawn slightly exposed in figure 7b for clarity). Penis not extracted (but see Pinhey 1972: fig. 3k).

**Measurements [mm]:** Entire length 35.0, abdomen length (excl. appendages) 28.9, Fw length 20.1, Hw length 19.3, Pt in Fw 0.9.

#### Variation and female

See Pinhey (1972) for detailed descriptions and illustrations of both sexes from Dondo.

*Africallagma pallidulum* sp. nov.  
(Fig. 6a)

*Enallagma sinuatum* f. *fugax* Pinhey, 1962a: 899, fig. 5a-b.

#### Etymology

Pinhey's (1962a) name *fugax* (fleeing, timid, shy) probably referred to the species's small, pallid appearance; hence the Latin adjective *pallidulum*, diminutive of *pallidum*, is proposed.

#### Specimens studied

**Holotype** ♂: Malawi, Northern Region, Mzimba District, 10 km N of Mzuzu, Nkhorongo, upper reach of Pongomo ("Jordan Dambo"), grassy ditches among agricultural fields (11°22.98'S, 33°58.86'E; alt. 1,325 m a.s.l.), 17 xii 2001, leg. K.-D.B. Dijkstra, RMNH. — 2 ♂, 1 ♀ (paratypes): Malawi, Central Region, Lilongwe District, 45 km SW of Lilongwe, Dzalanyama Forest Reserve, SE of Dzalanyama Forest Lodge, miombo woodland with rocky areas and marshy grassland (14°15.6'S 33°27.3'E; alt. 1,250 m a.s.l.), 29 xii 2001, leg. K.-D.B. Dijkstra, RMNH. — 1 ♂: Malawi, Limpasa dambo, 11 v 1966, leg. E. Pinhey, NMBZ. 1 ♂ ('holotype' f. *fugax*): Zambia, Broken Hill (= Kabwe), v 1961, leg. E. Pinhey, NMBZ. 1 ♂ ('paratype' f. *fugax*): Zambia, Lisombo river, v 1961, leg. E. Pinhey, NMBZ. 1 ♂ ('paratype' f. *fugax*): Zambia, Kabompo river, v 1961, leg. E. Pinhey, NMBZ.

#### Diagnosis

Males are smaller (Hw 16-18 vs 18-20 mm) and paler than *A. sinuatum*, e.g. the all blue S10 lacks black dorsum, and the black middorsal stripe that occupies about one-third of each mesepisternum in *A. sinuatum* is replaced by a pale brown stripe. The cerci are rounded (not sinuous) in dorsal view and end in a slender barely hooked tooth, rather than a short strongly hooked tooth – best seen in caudal view; the paraprocts have incurved spines, their points converging, rather than straight (parallel or diverging) spines (Fig. 6). Unlike other *Africallagma* females, each mesepisternum bears a distinct transverse ridge just behind the mesostigmal lamina.

... by a dark marking in the male. The two species can occur together and all known localities of *A. pallidulum* sp. nov. (see Specimens studied) lie within the range of *A. sinuatum*, which extends from Katanga to S Tanzania, N Mozambique and NE South Africa (Pinhey 1984; own observations).

#### Description of holotype male

Preserved dry, in envelope. In good condition.

**Head:** Underside including labium and genae creamy white; face to level of antennae pale greenish blue, with a pair of small pale brown spots in the depressions on the postclypeus. Dorsum with straight pale brown band between the eyes from level of antennae to posterior side of vertex; in this brown band are a pair of tiny black spots flanking the anterior ocellus postero-laterally and black hair-lines on the sutures demarcating the postocular lobes. Each lobe bears a narrow, wedge-shaped pale blue postocular spot, bordered posteriorly by a pale brown wedge that barely extends onto the postgenae; the spots are connected by a pale blue bar behind the vertex.

**Thorax:** Prothorax pale blue, dorsum broadly pale brown. Synthorax pale blue marked with pale brown: straight middorsal stripe occupying about half of each mesepisternum; straight humeral stripe occupying about one-sixth of mesepisternum and half of mesepimeron, extending onto the dorsal third of the mesokatepisternum; faint, short hair-line on interpleural suture. Thus a straight and complete pale blue antehumeral is spared out from the pale brown synthoracic dorsum, which is about one-third as wide as the mesepisternum. Black markings are limited: small roundish spot on mesepisternum lying against dorsal end of each mesostigmal lamina; spot in humeral fossa; spot in metepisternal half of mesopleural fossa; hair-line in humeral suture. Dorsal end of each mesostigmal lamina raised to a slight ear-like ridge. Synthoracic venter creamy white. Legs beige-white except for blackish tips to tarsi and claws.

**Wings:** Clear; venation pale brown; Pt pale pinkish brown with indistinct paler margin, ca one cell long, rhomboidal with anterior and posterior borders about equal in length, but distal and proximal borders longer than anterior border in Hw and shorter in Fw; Hw Pt are about 2/3 the size of Fw Pt. 10 Px in both Fw, 9 in both Hw.

**Abdomen:** S1-3 largely pale blue: S1 with some brown dorsally near base; S2 with fine brown spearhead-marking on apical half of dorsum; S3 with thin but complete dorsal brown line that expands abruptly subapically. S4-7 brown: narrowly blue at base, apex and laterally, the amount gradually decreasing towards S7. S8-10 wholly pale blue. Appendages whitish, although cerci are blue-greyish dorsally, with blackened teeth; shaped as in Figure 6a. Penis not extracted (Figure 6a shows that of paratype).

**Measurements [mm]:** Entire length 32.7, abdomen length (excl. appendages) 26.7, Fw length 16.5, Hw length 15.9, Pt in Fw 0.8.

#### Variation and female

One paratype male was dissected for scanning electron microscopy (Fig. 6a). The second male paratype is slightly darker than the holotype: legs brownish with weak dark femoral streaks; Pt a fraction darker in Fw than Hw. 9-10 Px in Fw, 8 in both

#### *Trithemis integra* sp. nov. (Figs 11a, b)

*Trithemis basitincta* nec Ris, 1912 group 1a-b — Pinhey (1961c: 167-168; fig. 11.24a)  
*Trithemis basitincta* nec Ris, 1912 — Pinhey (1970b: 138, fig. 51a-e).  
*Trithemis bifida* nec Pinhey, 1970 — Pinhey & Pinhey (1984: 135).  
*Trithemis* "species near *congolica* [nec Pinhey, 1970]" — Miller (1993: 8)  
*Trithemis* sp. — Dijkstra (2007: 15).

#### Remarks

Pinhey (1970b) supplied detailed descriptions and illustrations of this species under the incorrect name *T. basitincta* and it thus remains unnamed (Dijkstra 2007). Specimens listed by Pinhey & Pinhey (1984) as *T. bifida* were selected as the type series. The new species seems restricted to rainforests close to the Albertine Rift. At Budongo Forest in Uganda "several individuals were regularly seen in one well shaded part of ... stream, flying actively and perching on marginal vegetation" (Miller 1993).

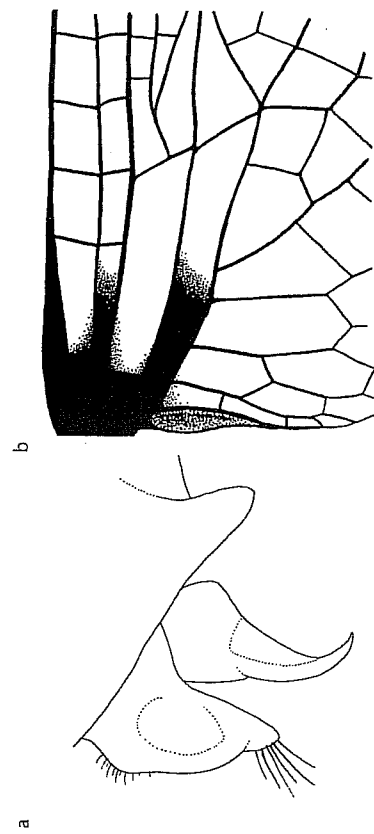


Figure 11: *Trithemis integra* sp. nov. male — (a) secondary genitalia in lateral view; (b) Hw base.

Pinhey (1970b; 1978b) repeatedly emphasised the undivided anterior lamina of this species and named *T. bifida* so for its contrasting divided state. Therefore the Latin adjective *integra* (whole, entire) is proposed.

#### Specimens studied

Holotype ♂: Tanzania, Mpanda district, Luegele, Luntampa, Kapapa (ca 5°52'S, 30°09'E; alt. ca 1,100 m a.s.l.), 18 i 1970, leg. J. Kielland, RMNH. — 1 paratype ♀: Tanzania, Kigoma, Helembé (alt. 800-900 m), 01 ii 1970 — 1 paratype ♂: Tanzania, Mpanda district, Mugombazi river (ca 5°48'S 30°00'E; alt. ca 1,000 m), i 1971, leg. J. Kielland, RMNH. — 2 paratype ♂: Tanzania, Kigoma, Kefú forest, ii-iv 1972, leg. J. Kielland, RMNH. — 1 ♂: Uganda, Bwamba Forest (= Semliki National Park), vi-viii 1946, leg. van Someren, NMBZ. — 2 ♂: Uganda, "20 miles west of Kampala", 13 v 1952, leg. E. Pinhey, NMBZ. — 2 ♂: Congo-Kinshasa, Ituri Forest, ii 1958, leg. E. Pinhey, NMBZ. — 2 ♂: Uganda, Budongo Forest, 13 ix 1992, leg. & coll. P. Miller (Oxford).

#### Diagnosis

Large and dark *bastincta*-group species with unique secondary genitalia (Fig. 11a): anterior lamina with undivided apex, pointed in lateral view, broad with widely furrowed anterior side in rostral view, bearing a (sometimes thin) clump of hairs; genital lobe is short and triangular; penis has two 'cornua' just extending beyond the lateral lobes but lacks visible inner lobes. The largest (Hw 33-35 mm) and most densely veined *bastincta*-group species (usually 16½-17½ Fw Ax, range 14½-18½) aside from *T. africana* and *T. tropicana*, with a distinctive two-streaked blackish marking at Hw base (Fig. 11b).

#### Description of holotype male

Preserved dry, pinned. In good condition, although slightly stained.

**Head:** Labium brown-yellow, with central lobe and inner halves of lateral lobes black. Face dark brown, with entire labrum and centre and anterior borders of clypeus black. Entire dorsum of frons and vertex blackish with strong metallic purple lustre. Antennae black. Occipital triangle dark brown. Back of head brown, interrupted by two transverse black bars on postgenae.

**Thorax:** Prothorax somewhat concealed by head, rather dark overall. Synthorax marked about equally with black and brownish yellow, but pattern indistinct due to some staining, as well as dull blue pruinosity, which is most concentrated on mesepisterna: pattern consists of alternating bands of similar width, black anteriorly on mesepisterna, metepisterna and metepimera, and yellow posteriorly. Venter of synthorax brownish yellow, with black borders to metepimera and poststernum. Legs entirely black, but coxae and outer base of fore femora indistinctly dark brown.

**Wings:** Clear, slightly brownish at extreme tips; venation blackish; Pt deep brown. Fw very narrowly brown at extreme base. Hw base marked sharply with blackish brown, filling about two thirds of subcostal space up to Ax1 and cubital space somewhat distal of Cux, this marking extending into adjacent spaces, but less intense there and not extending as far distally (Fig. 11b). Arculus slightly proximal of Ax2.

In Fw 17½-18½ Ax, in Hw 13, in Fw 11 Px, in Hw 12-13. Bridge and cubital space each with a single cross-vein in all wings. Fw triangles of 2, Hw triangles of 1 and subtriangles of 3 cells; supatriangles uncrossed. Fw discoidal field narrowed terminally, of three cell-rows almost throughout. Rspl subtends 5-6 cell-doublings in all wings. Anal loop of 29-30 cells. Four rows of cells between anal loop and tornus.

**Abdomen:** Very slender; narrowest at base S4, widest at S7, those segments 4.25x and 2.20x as long as wide respectively. Tergites black dorsally: S1-2 and base of S3 largely yellow-brown laterally; S4-7 and apical portion of S3 with pair of pale brown streaks lying roughly halfway between lateral and dorsal carinae and base and apex of each segment, extending along approximately 60% of length thereof; S8-10 unmarked. Tergites S1-8 ventrally pale brown, narrowly black along lateral carinae and broadly (ca 20% of segment length) at apex and base of each segment; venter S9-10 black. Sternites, appendages and secondary genitalia blackish, the latter shaped as in Figure 11a: anterior lamina broad with straight apical profile in rostral view, but with a wide and fairly deep furrow on anterior face; penis of holotype not examined. **Measurements [mm]:** Entire length 44.0, abdomen length (excl. appendages) 29.5, Fw length 36.5, Hw length 35.0, Pt in Fw 3.5.

#### Variation and female

Variation in males ( $n = 11$ ) is limited. Hw length 33.0-35.0 mm. 14½-18½ Fw Ax; 9-12 Fw Px. Paratype female somewhat teneral and laterally compressed, with vulgar scale concealed. Pale markings more extensive and distinct than in holotype. Markings at Hw base as holotype but much fainter, amber-brown, and even more strongly confined to subcostal (almost to Ax1) and cubital spaces (about to Cux), all wing tips brownish, more than in males, labrum black, inner third of labium black, black band on frons about as deep as two-thirds of vertex length. S3-7 each with two pale stripes, additional one along lateral carina, superior stripe on S7 much broader than other segments, S8 black except for a minute almost indiscernible pale spot. Hw length 34.5 mm. 17½-18½ Fw Ax; 10 Fw Px.

#### ACKNOWLEDGEMENTS

I thank Peter and Verity Mundy for all their help during my stay in Bulawayo, and Raphael Chahwanda, Rudo Sithole and especially Shepard Ndlela for their assistance in the museum. Marcello d'Andrea, Hans-Joachim Clausnitzer, Viola Clausnitzer, Heinrich Fliedner, Heike Hadrys, Jens Kipping, John Joseph Kisakyé, Jean Legrand, Mike May, Kate Miller, Roberto Poggi, Mike Samways, Wolfgang Schneider, Kai Schütte, Frank Stokvis, Fabio Terzani, Jan van Tol, Graham Vick and Charlie Williams provided useful comments, information or specimens. Eliane de Coninck, Jos De Becker, Dave Goodger, Kjell Arne Johanson, Wanja Kinuthia, Jean Legrand, Marc de Meyer, Laban Njoroge and Michael Ohl were helpful during visits to BMNH, MNHN, MRAC, NHRS, NMKE and ZMHB. Work in BMNH, ISNB, MNHN, MRAC and NHRS was supported by the SYS-RESOURCE, ABC, COLPARSYST, SYNTHESYS and HIGH LAF infrastructures of the European Union IHP Programme. The International Dragonfly Fund made additional visits to BMNH, NMKE and ZMHB possible. This study was supported by grants from the German Federal Ministry of Science (BMBF, BIOLOG Programme, 01LC0025 and 01LC0404). RMNH provided working facilities.

- The taxa of which name-bearing types are held in NMBZ (as well as forms) are indicated for each publication in square brackets (original combination and spelling).
- Aguesse, P., 1966. Contribution à la faune de Congo (Brazzaville) Mission A. Villiers et A. Descarpentries XXI. Odonates. Bulletin de l'Institut Fondamental d'Afrique Noire (A) 28: 783-797.
- Blackman, R.A.A. & E. Pinhey, 1967. Odonata of the Seychelles and other Indian Ocean island groups, based primarily on the Bristol University Expedition of 1964-1965. *Arnoldia Rhodesia* 12 (3): 1-38. [*Lestes unicolor aldabrensis*].
- Bridges, C.A., 1994. Catalogue of the family-group, genus-group and species-group names of the Odonata of the world (third edition). Bridges, Urbana.
- Brooks, S.J. & K.A. Jackson, 2001. The Odonata of Bioko, Republic of Equatorial Guinea, with the description of fan-shaped setae on early instar Libellulidae larvae. *Odonatologica* 30: 29-38.
- Carfi, S. & M. d'Andrea, 1994. Contribution to the knowledge of odonatological fauna in Sierra Leone, West Africa. *Problemi Attuali di Scienza e di Cultura* 267: 111-191.
- Clausnitzer, V., 2003a. *Teinobasis alluaudi* Martin, 1896 from mainland Africa: notes on ecology and biogeography (Zygoptera: Coenagrionidae). *Odonatologica* 32: 321-334.
- Clausnitzer, V., 2003b. Rediscovery of *Amanipodagrion gilfiesi*, with notes on habitat, behaviour and conservation (Odonata: Megapodagrionidae). *International Journal of Odonatology* 6: 1-8.
- Clausnitzer, V. & K.-D.B. Dijkstra, 2005. The dragonflies (Odonata) of Ethiopia, with notes on the status of endemic taxa and the description of a new species. *Entomologische Zeitschrift* 115: 117-130.
- Cowley, J., 1936. The *Disparoneura*-complex: generic characters and lists of species (Odonata). *Annals and Magazine of Natural History* 10: 509-529.
- d'Andrea, M. & S. Carfi, 1997. Nuove raccolte di odonati del Camerun con note su *Agrionemis maclachlani* Selys, 1877 e *A. alligulae* Pinhey, 1974 e descrizione di *Agrionemis dissimilis* sp. nov. e *Trithemis osvaldae* sp. nov. *Atti della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano* 136: 157-190. [*Agrionemis dissimilis*].
- Dijkstra, K.-D.B., 2003a. Problems in *Chlorocypha* classification: four cases from West Africa and a discussion of the taxonomic pitfalls (Odonata: Chlorocyphidae). *International Journal of Odonatology* 6: 109-126.
- Dijkstra, K.-D.B., 2003b. A review of the taxonomy of African Odonata: finding ways to better identification and biogeographic insight. *Cimbebasia* 18: 191-206.
- Dijkstra, K.-D.B., 2004. Dragonflies (Odonata) of Mulanje, Malawi. IDF-Report 6: 23-29.
- Dijkstra, K.-D.B., 2005a. A review of continental Afrotropical *Ceragrion* (Odonata: Coenagrionidae). *Journal of Afrotropical Zoology* 2: 3-14 [erratum in: *Journal of Afrotropical Zoology* 3: 162-163 (2007)].
- Dijkstra, K.-D.B., 2005b. Lake Malawi's Dancing Jewel: Elliot Pinhey's letters to its discoverer John Wilson. *W.D.A.'s Agrion* 9: 23-24.
- Dijkstra, K.-D.B., 2007. The name-bearing types of Odonata held in the Natural History Museum of Zimbabwe, with systematic notes on Afrotropical taxa. Part 1: introduction and Anisoptera. *International Journal of Odonatology* 10: 1-29.
- Dijkstra, K.-D.B., V. Clausnitzer & A. Martens, 2007. Tropical African *Platycnemis* damselflies (Odonata: Platycnemididae) and the biogeographical significance of a new species from Pemba Island, Tanzania. *Systematics & Biodiversity* 5: 187-198.
- i: Afromontane and mid-altitude forests. Bulletin du Jardin Botanique National de Belgique 59: 3-131.
- Fraser, F.C., 1946. Notes on synonymy in the Odonata. *Entomologist's Monthly Magazine* 82: 201-202.
- Fraser, F.C., 1948. Three new species of Ethiopian Odonata. *Proceedings of the Royal Entomological Society of London (B)* 17: 5-10.
- Fraser, F.C., 1955a. Contributions à l'étude de la faune entomologique du Ruanda-Urundi (Mission P. Basilewsky 1953) III. Neuroptera et Odonata. *Annales du Musée Royal du Congo Belge* 36: 21-26.
- Fraser, F.C., 1955b. Four new species of Odonata from the Belgian Congo. *Revue de Zoologie et de Botanique Africaines* 52: 17-54.
- Fraser, F.C., 1955c. Odonata. *Parc National de l'Upemba* 38: 1-34.
- Fraser, F.C., 1956. *Pseudagrion superbum*, *Gynacantha flavipes* and *Gynacantha immaculifrons*, three new species of Odonata from the Belgian Congo. *Revue de Zoologie et de Botanique Africaines* 54: 382-387.
- Fraser, F.C., 1957. A reclassification of the order Odonata. *Royal Zoological Society of New South Wales, Sydney*.
- Gambles, R.M., 1975. A new species of *Chlorocypha* Fraser, 1928 (Odonata: Chlorocyphidae) from Nigeria, and some new or little-known Nigerian subspecies of forms better known from the Cameroons. *Entomologist's Monthly Magazine* 111: 105-121.
- Gambles, R.M., 1976. The problem of the *Lestes pallidus* group (Zygoptera: Lestidae). *Odonatologica* 5: 15-26.
- Gerstaecker, C.E.A., 1869. Beitrag zur Insekten-Fauna von Zanzibar. No. II. Orthoptera et Neuroptera. *Archiv für Naturgeschichte* 35: 201-223.
- Grünberg, K., 1902. Neue Odonaten aus dem Njassa-Gebiet, gesammelt von Dr. Fülleborn. *Sitzungsberichte der Gesellschaft Naturforschender Freunde Berlin* 9: 230-237.
- Grünberg, K., 1903. Zur Kenntnis der Odonatenfauna des ostafrikanischen Seengebietes. *Ergebnisse der Nyassa-See- und Kinga-Gebirgs Expedition der Hermann und Elise beg. Heckmann-Wentzel-Stiftung. Zoologische Jahrbücher* 18: 695-726.
- Hancock, D.L., R. Chahwanda & P. Mhlanga, 1995. A catalogue of the insect type specimens in the Natural History Museum of Zimbabwe. *Syntarsus* 2: 1-46.
- International Commission on Zoological Nomenclature, 1999. *International Code of Zoological Nomenclature*. International Trust for Zoological Nomenclature, London.
- Karsch, F., 1894. Libellen von der deutschen Forschungs-Station Yaunde im Hinterlande von Kamerun, gesammelt von Herrn G. Zenker. *Berliner Entomologische Zeitschrift* 39: 11-16.
- Kimmins, D.E., 1970. A list of the type-specimens of Odonata in the British Museum (Natural History). Part III. *Bulletin of the British Museum (Natural History)*, Entomology 24: 171-205.
- Legrand, J., 1984. Trois nouveaux Zygoptères forestiers du Gabon oriental et une synonymie nouvelle (Chlorocyphidae, Protoneuridae, Coenagrionidae). *Odonatologica* 13: 237-244.
- Legrand, J., 1985. *Elatoneura* afrotropicaux nouveaux ou peu connus (Odonata, Protoneuridae). *Nouvelle Revue d'Entomologie (N.S.)* 2: 159-168.
- Legrand, J., 2003. Les Odonates du Nimba et de sa région. In: Lamotte, M. & R. Roy (eds) "Le peuplement animal du mont Nimba (Guinée, Côte d'Ivoire, Libéria)." *Mémoires du Muséum National d'Histoire Naturelle* 190: 231-310.
- Legrand, J. & M. Lachaise, 1980. Contribution à la faune du Congo (Brazzaville) Mission A. Villiers et A. Descarpentries. *Bulletin de l'Institut Fondamental d'Afrique Noire (A)* 42: 586-593.



Pinhey, E., 1963a. Notes on both sexes of some tropical species of *Ceragrion* Selys (Odonata). *Annals and Magazine of Natural History* 13: 17-28. [*Ceragrion glabrum longispinum*, *C. sakejiji*].

Pinhey, E., 1963b. Some anomalous types of African Odonata and the description of a new species. *Journal of the Entomological Society of Southern Africa* 26: 146-160.

Pinhey, E., 1964a. Dragonflies (Odonata) of the Angola-Congo borders of Rhodesia. *Publicações Culturais Companhia de Diamantes de Angola* 63: 97-130. [*Schnuragrion nodosum*, *Pseudagrion coeruleipunctum*].

Pinhey, E., 1964b. Further records of African dragonflies (Odonata). *Journal of the Entomological Society of Southern Africa* 26: 324-336. [*Ichnura hilli*, *Pseudagrion williamsi*].

Pinhey, E., 1964c. A revision of the African members of the genus *Pseudagrion* Selys (Odonata). *Revista de Entomologia de Moçambique* 7: 5-196. [*Pseudagrion chomae*, *P. coelestis samiyae*, *P. glaucescens form zambeziensis*, *P. helenae form planiranum*, *P. quadrioculatum*, *P. sjöstedti pseudosjöstedti*].

Pinhey, E., 1966a. Check-list of dragonflies (Odonata) from Malawi, with description of a new *Teinobasis* Kinyb. *Arnoldia Rhodesia* 2 (33): 1-24. [*Teinobasis malawiensis*].

Pinhey, E., 1966b. Notes on African Odonata, particularly type material. *Revue de Zoologie et de Botanique Africaines* 73: 283-308. [*Pseudagrion hageni tropicanum*].

Pinhey, E., 1966c. Odonata. Exploration du Parc National de la Garamba 45: 1-114.

Pinhey, E., 1967a. African Chlorocyphidae (Odonata). *Journal of the Entomological Society of Southern Africa* 29: 161-197. [*Chlorocypha rufitibia lucalaensis*, *C. schmidti*].

Pinhey, E., 1967b. Odonata of Ngamiland (1967). *Arnoldia Rhodesia* 3 (15): 1-17.

Pinhey, E., 1967c. Odonata Zygotera. Scientific Results of the Hydrobiological Survey of the Lake Bangweulu - Luapula River Basin 14: 1-43.

Pinhey, E., 1969a. A revision of the genus *Chlorocnemis* Selys (Odonata). *Occasional Papers of the National Museum of Southern Rhodesia* (B) 4: 209-266. [*Chlorocnemis marshalli* form *impedita*, *C. montana maccleeryi*, *C. nigripes* form *coeruleocauda*, *C. n. semlikiensis*, *C. nubilipennis rossii*].

Pinhey, E., 1969b. Two new species of Zygotera (Odonata). *Novos Taxa Entomologica* 66: 3-7. [*Ceragrion mourae*, *Enallagma cuneistigma*].

Pinhey, E., 1970a. A remarkable new zygoteran (Odonata) from Cameroons. *Arnoldia Rhodesia* 4 (37): 1-3. [*Argiocnemis umbargae*].

Pinhey, E., 1970b. Monographic study of the genus *Trithemis* Brauer (Odonata: Libellulidae). *Memoirs of the entomological Society of southern Africa* 11: 1-159.

Pinhey, E., 1971a. A new Zygoteran genus (Odonata) from Malawi. *Arnoldia Rhodesia* 5 (9): 1-6. [*Oreocnemis phoenix*].

Pinhey, E., 1971b. Notes on the genus *Pseudagrion* Selys (Odonata: Coenagrionidae). *Arnoldia Rhodesia* 5 (6): 1-4. [*Pseudagrion estesii*].

Pinhey, E., 1971c. Odonata collected in Republique Centre-Africaine by R. Pujol. *Arnoldia Rhodesia* 5 (18): 1-16.

Pinhey, E., 1971d. Odonata of Fernando Po Island and of neighbouring Cameroons Territory. *Journal of the Entomological Society of Southern Africa* 34: 215-230.

Pinhey, E., 1972. The genus *Acigrion* Selys (Odonata). *Occasional Papers of the National Museum of Southern Rhodesia* (B) 5: 1-59. [*Acigrion heterosticta karamoja*, *A. macrotitthinae*, *A. zambiensis*].

Pinhey, E., 1974a. A revision of the African *Argiocnemis* Selys and *Mortonagrion* Fraser (Odonata: Coenagrionidae). *Occasional Papers of the National Museum of Southern Rhodesia* (B) 5: 171-278. [*Argiocnemis aligulae*, *A. angolensis spatulae*, *A. falcifera transvaalica*].

Pinhey, E., 1974b. Three undescribed Odonata taxa from Africa. *Arnoldia Rhodesia* 7 (2): 1-6. [*Elatoneura tropicalis*].

Pinhey, E., 1975. New species of Limopinae (*Elatoneura* Cowley, 1935 from the Central African Republic, and some notes on the genus (Zygotera: Protonneuridae). *Odonatologica* 5: 153-164.

Longfield, C., 1936. Studies on African Odonata, with synonymy and descriptions of new species and subspecies. *Transactions of the Royal Entomological Society of London* 85: 467-498.

Martens, A., R. Jödicke & F. Suhling, 2003. An annotated checklist of the Odonata of Namibia. *Cimbebasia* 18: 139-160.

Martin, R., 1896. Odonates des îles Séchelles. *Memoires de la Société Zoologique de France* 9: 101-112.

Martin, R., 1908. Voyages de feu Leonardo Fea dans l'Afrique occidentale: Odonates. *Annali del Museo Civico di Storia Naturale di Genova* (Serie III) 43: 649-667.

Martin, R., 1910. Contribution a l'étude des Névroptères de l'Afrique. I. Les *Lestes* d'Afrique. *Annales de la Société Entomologique de France* 79: 82-95.

May, M.L., 2002. Phylogeny and taxonomy of the damselfly genus *Enallagma* and related taxa (Odonata: Zygoptera: Coenagrionidae). *Systematic Entomology* 27: 387-408.

Miller, P.L., 1993. Some dragonflies of the Budongo Forest, Western Uganda (Odonata). *Opuscula Zoologica Fluminensia* 102: 1-12.

Parr, M., 1983. The occurrence and habitat of *Oreocnemis phoenix* Pinhey in Mlanje Mountain, Malawi (Zygotera: Platynemididae). *Notulae Odonatologicae* 2: 28-30.

Pinhey, E., 1952. Three new species of Odonata from Eastern Africa. *Occasional Papers Coryndon Memorial Museum* 3: 13-16.

Pinhey, E., 1956. Some dragonflies of East and Central Africa and a rarity from Mauritius. *Occasional Papers of the Coryndon Museum* 4: 17-41. [*Pseudagrion pseudomassaicum* form *rusingae*].

Pinhey, E., 1959. New dragonflies of the genus *Argiocnemis* and a key to males of this genus. *Journal of the Entomological Society of Southern Africa* 22: 465-468.

Pinhey, E., 1960. Odonata collected by Oxford University Tanganyika Expedition: and a West African species. *Occasional Papers of the National Museum of Southern Rhodesia* (B) 3: 509-515. [*Chlorocypha hastata*].

Pinhey, E., 1961a. Dragonflies (Odonata) of Central Africa. *Occasional Papers of the Rhodes-Livingstone Museum* 14: 1-97. [*Chlorocypha fabamacula*, *C. frigida*, *Ceragrion katamborae*, *Pseudagrion chongwe*, *P. deningi*, *P. fisheri*, *Chlorocnemis lascelles*].

Pinhey, E., 1961b. Dragonflies collected on an expedition from Rhodesia to Nigeria in 1958, Part 1, observations on the journey and the new discoveries in dragonflies. *Entomologist's Monthly Magazine* 96: 256-271. [*Umma purpurea*, *Chlorocypha (Africocypha) greyi*, *C. (A.) ntaali*, *C. rufitibia*, *Pseudagrion greeni*, *P. greigi*, *P. pseudomassaicum doualae*, *Allocnemis mitwabae*].

Pinhey, E., 1961c. A survey of the dragonflies (order Odonata) of Eastern Africa. *British Museum (Natural History)*, London.

Pinhey, E., 1962a. New or little known dragonflies (Odonata) of Central and Southern Africa. *Occasional Papers of the National Museum of Southern Rhodesia* (B) 3: 892-911. [*Platycypha lacustris chingolae*, *Enallagma sinuatum* form *fugax*, *Pseudagrion mozambicensis*, *P. newtoni*].

Pinhey, E., 1962b. Some records of Odonata collected in Tropical Africa. *Journal of the Entomological Society of Southern Africa* 25: 20-50. [*Chlorocypha picta*, *Amanipodagrion glliesi*, *Lestes tarryi*, *Prodasineura incerta*].

Pinhey, E., 1962c. A descriptive catalogue of the Odonata of the African continent. *Publicações Culturais Companhia de Diamantes de Angola* 59: 11-323.

Rory A. Dow<sup>1</sup>, Chee Y. Choong<sup>2</sup> & Albert G. Orr<sup>3</sup>

<sup>1</sup> 6 Bramley Avenue, Coulsdon, Surrey, CR5 2DP, UK. <ror@dow.virgin.net>

<sup>2</sup> Centre for Insect Systematics, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia.

<sup>3</sup> CRC, Tropical Ecosystem Management, AES, Griffith University, Nathan, Q4111, Australia.

Key words: Odonata, dragonfly, Libellulidae, *Chalybeothemis chini*, *pruinosa*, Malaysia, Sarawak, Borneo

## ABSTRACT

*Chalybeothemis chini* sp. nov. from Pahang, Peninsular Malaysia, and *C. pruinosa* sp. nov. from Sarawak, Malaysian Borneo, are described from the male sex. The new species necessitate some redefinition of the previously monotypic genus, which is provided. The quiescent penis of *Chalybeothemis* is illustrated for the first time. Differences between *C. chini*, *C. fluviatilis* and *C. pruinosa* are discussed and tabulated. *C. fluviatilis* is reported from Sarawak for the first time. Relationships of *Chalybeothemis* within the Libellulidae are discussed.

## INTRODUCTION

Lieftinck (1933a) erected the genus *Chalybeothemis* for a single species, *C. fluviatilis* Lieftinck, 1933, described from specimens collected in west Kalimantan on the island of Borneo. Subsequently the species was reported from Billiton (now Belitung) Island (Lieftinck 1936), the Sampit area in southern Kalimantan (Lieftinck 1953), Singapore and Peninsular Malaysia (Lieftinck 1954), Brunei (Orr 2001) and Thailand (Pinratana 2003).

In March 2006 CYC collected a small series of an undescribed *Chalybeothemis* species upstream on the Chini river, which connects the large lake Chini with the Pahang river in Pahang, Peninsular Malaysia. This species is described here as *C. chini* sp. nov. In April 2006 G.T. Reels and RAD collected a small series of another unnamed species of *Chalybeothemis* at the large natural lake Loagan Bunut, situated in the national park of the same name, in Bahagian Miri, Sarawak, Malaysian Borneo. This species is closely related to *C. chini*, but differs in several structural features, most notably in its build and in the accessory genitalia, and is described here as *C. pruinosa* sp. nov. It is the second species of *Chalybeothemis* to be recorded from the island of Borneo, and *C. chini* is the second to be reported from Peninsular Malaysia. The new species were compared directly with the type series of *C. fluviatilis* in the Nationaal Natuurhistorisch Museum Naturalis (RMNH), Leiden, Netherlands. Terminology for the libellid penis follows Miller (1991), that for wing venation follows that used by Lieftinck (1933a) in his description of the genus; the reader is referred to Watson et al. (1991) for an explanation of this terminology. Penis structure was examined using a Scanning Electron Microscope (SEM).

Pinhey, E., 1978. A new species of *Pseudagrion* Sélys, its separation and comparisons (Odonata: Coenagrionidae). *Arnoldia Rhodesia* 8 (22): 1-10. [*Pseudagrion gamblesii*].

Pinhey, E., 1978b. Comparative notes on an African species of *Trithemis* Brauer (Odonata: Anisoptera) and its congeners. *Arnoldia Rhodesia* 8 (26): 1-8.

Pinhey, E., 1980a. A melanic morph amongst Transvaal Chlorolestidae. *Arnoldia Zimbabwe* 8 (39): 1-4. [*Chlorolestes fasciata* morph *nigerrimal*].

Pinhey, E., 1980b. A revision of African Lestidae (Odonata). Occasional Papers of the National Museum of Rhodesia (B) 6 (6): 327-479.

Pinhey, E., 1981. A new *Prodasineura* Cowley from Zambia (Odonata: Protoneuridae). *Arnoldia Zimbabwe* 9 (5): 69-72. [*Prodasineura flavifacies*].

Pinhey, E., 1982. *Platygypha caligata* (Selys) and a new lacustrine morph (Odonata: Chlorocyphidae). *Advances in Odonatology* 1: 213-225. [*Platygypha caligata* morph *lacus*].

Pinhey, E., 1984. A checklist of the Odonata of Zimbabwe and Zambia. *Smithersia* 3: 1-64.

Pinhey, E. & N. Pinhey, 1984. A preliminary list of the Odonata collected by Dr J. Kielland in Tanzania for Dr M.A. Lieftinck. *Odonatologica* 13: 129-138.

Ris, F., 1921. The Odonata or dragonflies of South Africa. *Annals of the South Africa Museum* 18: 245-445.

Samways, M.J., 1999. Diversity and conservation status of South African dragonflies (Odonata). *Odonatologica* 28: 13-62.

Samways, M.J., 2001. *Actagrion pinheyi* spec. nov. from South Africa (Zygoptera: Coenagrionidae). *Odonatologica* 30: 111-116.

Samways, M.J., 2006a. National Red List of South African Odonata. *Odonatologica* 35: 341-368.

Samways, M.J., 2006b. Threat levels to odonate assemblages from invasive alien tree canopies. In: Cordero Rivera, A. (ed.). "Forests and dragonflies." Pensoft Publishers, Sofia & Moscow 209-224.

Schmidt, E., 1951a. Libellen aus Portugiesisch Guinea, mit Bemerkungen über andere aethiopische Odonaten. *Arquivos do Museu Bocage* 20: 125-200.

Schmidt, E., 1951b. The Odonata of Madagascar, Zygoptera. *Memoires de l'Institute Scientifique de Madagascar (A)* 6: 116-283.

Schmidt, E., 1951c. Über neue und weniger bekannte afrikanische Platycnemididen (Odon.). *Mitteilungen der Münchner Entomologischen Gesellschaft* 41: 217-240.

Schouteden, H., 1934. Catalogues raisonnés de la faune entomologique du Congo Belge. *Pseudoneuroptères - Odonates*. *Annales du Musée du Congo Belge, Zoologie* 3: 1-84.

Sjöstedt, Y., 1917. Odonaten aus Abessinien, Ost- und Westafrika. *Arkiv för Zoologi* 11 (14): 1-27, 25 pls.

St. Quentin, D., 1942. Beiträge zur Kenntnis der Insektenfauna Deutsch-Ostafrikas, insbesondere des Matengo-Hochlandes. *Ergebnisse einer Sammelreise H. Zernys 1935/36*. IV. Odonata. *Annalen des Naturhistorischen Museums in Wien* 52: 106-116.

Suhling, F. & A. Martens 2007. Dragonflies and damselflies of Namibia. Gamsberg Macmillan, Windhoek.

Vick, G.S., 2002. Preliminary biodiversity assessment of the odonate fauna of the Takamanda Forest Reserve, Cameroon. *IDF-Report* 4: 1-10.