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The Afrotropical robber fly genus *Congomochtherus* Oldroyd, 1979 (Diptera: Asilidae: Asilinae)

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ABSTRACT

Information relating to the Afrotropical asilid genus *Congomochtherus* Oldroyd, 1979 is updated. Seven species are recognised (*acuminatus*, *elferinki*, *inachus*, *lobatus*, *oldroydi*, *penicillatus*, *potamius*). *Heligmonevra rufinota* Martin, 1964, which has been transferred to the genus, is digeneric and has consequently been reassigned to *Heligmonevra* Bigot, 1858. All records of species are provided together with maps showing their distributions. The close association of this genus with freshwater habitats is discussed.

KEY WORDS: Afrotropical, Asilidae, Asilinae, *Congomochtherus*, distribution, biology, identification key, freshwater habitat.

INTRODUCTION

Congomochtherus Oldroyd, 1979 (Fig. 1) is a particularly interesting genus of Afro-tropical Robber Flies (Asilidae) in that all species appear to live in association with freshwater habitats. Adults typically rest on rocks in and along the banks of streams or, more rarely, on muddy dam or lake shores. This update on work published over twenty-five years ago (Londt & Tsacas 1987) is occasioned by the significant accumulation of South African specimens housed in the KwaZulu-Natal Museum in Pietermaritzburg, South Africa. Distributional information and field observations are of considerable interest and suggest that the genus may be far more widely distributed than heretofore believed.

The taxonomic history of *Congomochtherus* is short and can be summarised briefly as follows:

Speiser (1910) – Described *Machimus penicillatus* from material collected near Mount Meru in Kenya.

Lindner (1955) – Recorded *Machimus penicillatus* from Ngaruka (Tanzania).

Martin (1964) – Described *Heligmonevra rufinota* from seven localities in central, eastern and western Madagascar.

Oldroyd (1970) – In reviewing the Asilidae of the Congo Basin, described *lobatus* on material from ‘Northern Nigeria’, DR Congo (five localities) and Tanzania (one locality), establishing it as the type-species of his new genus *Congomochtherus*. He compared the genus to *Machimus* Loew, 1849 and transferred *penicillatus* to it, separating the two species in a key.

Oldroyd (1974) – Described *C. acuminatus* from two localities in Angola.

Oldroyd (1980) – Catalogued the known species, listing *acuminatus*, *lobatus* and *penicillatus*. The Madagascan species, *rufinota*, being listed under *Heligmonevra* Bigot, 1858 (= *Heligmonevra*).

Londt & Tsacas (1987) – Reviewed the genus, adding four new species: *elferinki* (South Africa; Zimbabwe), *inachus* (South Africa), *oldroydi* (Kenya) and *potamius* (South Africa).



Fig. 1. *Congomochtherus elferinki* Londt & Tsacas, 1987, entire male specimen.

Londt (2002) – Included *Congomochtherus* in a key to Afrotropical Asilinae.

Tomasovic (2006) – Transferred *H. rufinota* to *Congomochtherus* without explanation.

Dikow (2009) – Included *Congomochtherus* in a detailed phylogenetic study of Asilidae.

There were, therefore, eight species assigned to the genus at the commencement of this study, seven being those covered by Londt and Tsacas's (1987) review, and the eighth being one transferred to the genus by Tomasovic (2006) after a study of some Madagascan *Heligmonevra*. Although no new species are described in this review, much new information is made available that should be of interest to students of Afrotropical Asilidae.

MATERIAL AND METHODS

No formal descriptions are offered in this paper as these are available through consulting previously published taxonomic accounts. Although some comments are offered relating to taxonomic matters, most relate to the distribution of species and what is known regarding their biology. In listing known records, those published earlier are repeated for convenience while any unpublished records are provided in a standardised format. The location of specimens is provided using the following institutional abbreviations:

BMNH – The Natural History Museum, London, UK;

GULB – Unité d'Entomologie fonctionnelle et évolutive, Gembloux Agro-Bio Tech, Université de Liège, Gembloux, Belgium;

MNHN – Muséum national d'Histoire naturelle, Paris, France;
 MRAC – Musée Royal de l'Afrique Centrale, Tervuren, Belgium;
 NMNW – National Museum of Namibia, Windhoek, Namibia;
 NMSA – KwaZulu-Natal Museum, Pietermaritzburg, South Africa;
 SAMC – Iziko South African Museum, Cape Town, South Africa;
 SANC – National Collection of Insects, Pretoria, South Africa.

Efforts made to relocate places where material was personally collected and to identify the likely places where material has been collected by others, were facilitated by Google Earth. In recording coordinates I have also included approximate altitudes as indicated on Google Earth as these may be of future interest.

Congomochtherus Oldroyd, 1970

Congomochtherus Oldroyd, 1970: 305. Type species: *Congomochtherus lobatus* Oldroyd, 1970, by original designation.

Diagnosis: The following diagnosis includes characters used to separate the genus from others in the subfamily Asilinae (Londt 2002). *Head*: Antennal style composed of three elements (small basal segment, long main segment and terminal spine-like tip); facial gibbosity only moderately developed. *Thorax*: Prosternum fused with proepisternum; dorsocentral setae reach transverse suture but do not extend anterior to it; postpronotal lobe with fine, long setae; scutellum with only one pair of marginal macrosetae; anepisternum never with strong macroseta at superoposterior angle, in front of wing insertion; katatergite with a vertical row of macrosetae; anatergite setose. *Wings*: R_{2+3} joining R_1 proximal to end of R_1 , cell r_1 thus closed and separated from wing margin. *Legs*: Metathoracic coxa with a single lateral macroseta; metathoracic femora uniformly dark red-brown to black (proximal or distal end may be slightly paler); tibia 1 without an apical spur; alula and pulvilli present. *Abdomen*: T2 slightly longer than wide; S1 confined beneath T1; male terminal abdominal segments tubular and not laterally compressed; aedeagus more or less straight or with a slight curve; female cerci frequently with short spinose setae dorsally; ovipositor conical.

Relationships: Dikow (2009) included *C. inachus* in an extensive phylogenetic study, confirming the genus to belong to the Asilinae but refraining from allocating it to any particular tribe (see discussion below).

Congomochtherus acuminatus Oldroyd, 1974

Figs 5, 17

Congomochtherus acuminatus Oldroyd, 1974: 151; Londt & Tsacas 1987: 31 (figs 5–10 ♂ terminalia).

Previously recorded material: Oldroyd (1974) recorded type material as follows: 'Type in London [BMNH]. Type-locality: ANGOLA (A37), 8 km N.E. Negola [c. 14°08'S 14°30'E, c. 1610 m], 25.iii.1972 (B.M. S. Afr. Exped., 1972).' He also lists under Distribution '2♂ 2♀ from type-locality; 1♀ from ANGOLA (A40): Tundavala [?], 13–16 km N.W. Sa da Bandeira [c. 14°01'S 15°11'E, c. 1505 m], 27–29.iii.1972.'

Londt & Tsacas (1987) listed the following material: NAMIBIA: 1♂, Kavango, Andara, 1821AB [c. 18°03'44"S 21°26'35"E, c. 1030 m], 20–25.viii.1971, H 3331 (NMNW); 1♂ 1♀, Popa Falls, 18°07'S 21°31'E, [c. 980 m], 26–31.viii.1971, H 4035 (NMSA). ZAMBIA: 1♀, Haut Zambeze, Lealui [c. 15°13'S 23°01'E c. 1020 m], Ellenberger, 1915 (MNHN).

Newly recorded material: NAMIBIA: 1♀, Kavango, Andara [details identical to above record] (NMSA); 1♀, Popa Falls [details identical to above record] (NMSA); 1♂, Kavango, Camp Popa, 18°07'S 21°34'E, [c. 1010 m], 28.ii–5.iii.1994, Schumann (NMSA).

TABLE 1
Phenology of *Congomochtherus* species. Months – starting from July.

Sp. / Month	J	A	S	O	N	D	J	F	M	A	M	J
<i>acuminatus</i>	—	●	—	—	—	—	—	—	●	—	—	—
<i>elferinki</i>	—	—	—	●	●	●	●	●	●	●	—	—
<i>inachus</i>	—	—	●	●	●	●	—	—	—	—	—	—
<i>lobatus</i>	●	●	—	●	●	●	—	●	—	●	●	—
<i>oldroydi</i>	—	—	—	—	●	—	—	●	—	—	—	—
<i>penicillatus</i>	—	—	—	●	●	●	●	●	—	●	●	—
<i>potamius</i>	—	—	—	—	—	—	●	●	—	—	—	—
No.	1	2	1	4	5	4	3	5	2	3	2	0

Distribution (Fig. 17), phenology (Table 1) and biology: Known essentially from five localities in southern Angola (2), northern Namibia (2) and western Zambia (1). I have no personal experience of collecting this species, but all the localities appear to coincide with rivers. The type locality, Negola, lies at the foot of a mountain range (with a high point of *c.* 1960 m) and any rainfall over these mountains runs off in a southeasterly direction via a number of small streams. It was probably along one of these (8 km NE of Negola) that the majority of type material was collected. The other Angolan locality, Tundavala, cannot be traced. There is, however, a populated place called Tundava which may be the place referred to on the label, but without certainty nothing can be deduced. The two Namibian localities of Andara and Popa Falls lie a short distance from each other and from the Cuito River which forms the boundary between Namibia and Angola. There can be little doubt that the specimens were collected along the river, probably resting on rocks like most species of the genus. The single Zambian record is for the small populated place called Lealui, which lies at the confluence of two rivers that drain the Liuwa Plain to the north, and which lies to the north of the Barotse Flood Plain not far from the main centre of Mongu. Again it is reasonable to suggest that the specimen was collected on the banks of one of the rivers that converge on Lealui. The species has been collected in August and March (Table 1), and so it can be postulated that this is a summer-active species. Nothing is known of its biology.

Congomochtherus elferinki Londt & Tsacas, 1987

Figs 1, 2, 6, 17

Congomochtherus elferinki Londt & Tsacas, 1987: 32 (figs 1 whole ♂, 2 postmetacoxal area, 11 wing, 12–17 ♂ terminalia, 18 ♀ terminalia).

Previously recorded material: Londt & Tsacas (1987) listed the following type material: SOUTH AFRICA: 2♂ (paratypes), F. Oldreives Outlook Est., 22°59'S 29°50'E, Louis Trichardt, Zoutpansberg, 1415 m, 4–8. xii.1978, Falc. Coll. Exp. (NHMZ); 1♀ (paratype), Mogoto Nature Res., Zebediela, 24°15'S 29°15'E, [*c.* 1405 m], 22–25.x.1979, Prinsloo (SANC); 1♂ (paratype), Nyl Rivier 8 km SW of Nylstroom [Modimolle *c.* 24°46'S 28°21'E *c.* 1190 m], 2428CD, 29–31.i.1978, Londt, bushveld near river (NMSA); 1♂ (paratype), Gladdespruit river headwaters at Kaapsehoop [Kaapschehoop *c.* 25°35'S 30°46'E *c.* 1635 m], 2530DB, 5000 ft, 3.xi.1970, Stuckenberg, grassland & gallery forest (NMSA); 1♂ (paratype), Pretoria. Rooodeplaas Hort. Res. Inst., 25°41'S 28°18'E, [*c.* 1280 m]. 1.xi.1979, Van Tonder (SANC); 3♂ 2♀ (paratypes), Barberton, Havelock Road, 2531CC, 7.xi.1970, Stuckenberg, Lomati River [Barberton Nature Reserve *c.* 25°51'S 31°06'E *c.*



Fig. 2. *Congomochtherus elferinki* Londt & Tsacas, 1987, habitat (Garden Castle Hotel area, Mlamboja River).

1505 m], headwaters montane meadow (NMSA); 2♂ 3♀ (paratypes), Johannesburg, Sandton [c. 26°06'S 28°03'E c. 1630 m], 2628AA, 7 (1♂ 2♀) & 14.ii.1982 (1♂ 1♀), Elferink (NMSA); 1♂ (paratype), Argent [Argent Ave., Roodepoort 26°08'S 27°53'E c. 1600 m], 24.xii.1939, Capener (NMSA); 1♂ 1♀ (paratype), Halfway House, 28.ii.1982, Elferink, Jukskei River [26°08'S 28°08'E c. 1570 m] (NMSA); 7♂ (holotype & paratypes) 8♀ (paratypes), Johannesburg, Highlands North [c. 26°09'S 28°05'E c. 1675 m], 2628AA, 21.ii.1981 (2♀) 7.iii.1982 (7♂ 6♀), Elferink, [possibly James & Ethel Gray Park – c. 26°08'21"S 28°03'50"E] (NMSA 5♂ (inc. holotype) 4♀, MNHN, BMNH); 1♂ (paratype), Klipfontein, 28°18'S 24°08'E, [c. 1300 m], 4.xii.1979, Falc. coll. Exp. (NHMZ); 6♂ 2♀ (paratypes), Cathedral Peak area, 2829CC, 4100', 20.xi.1979, Londt, Mhlwezine Riv. [c. 28°56'S 29°14'E c. 1320 m] (NMSA); 2♂ 2♀ (paratypes), Giant's Castle Game Res., Injasuti [Injisuthi c. 29°07'S 29°26'E c. 1455 m] area, 2929AB, Londt, 5–11.xii.1983, (NMSA); 5♂ 1♀ (paratypes), 5 km W of Matatiele [c. 30°19'S 28°44'E c. 1435 m], 3028BC, 8.i.1979, Londt & Stuckenberg, open grassveld nr. stream or river banks on grass (NMSA); 2♂, (paratypes), Xuka River, 10 km E Engcobo [c. 31°40'S 28°07'E c. 720 m], 3128CA, 26.x.1978, Londt & Miller, river bank (NMSA). ZIMBABWE: 1♂ (paratype), Penhalonga [= Penhalonga c. 18°53'S 32°40'E, c. 1160 m], 6.xii.1978, Wheeler (NMSA).

Newly recorded material: SOUTH AFRICA: 1♀, Pietersburg [= Polokwane], 29°29'S 23°45'E [error – c. 23°54'S 29°27'E, c. 1250 m], 13.ii.1987, Erasmus, Dept. Entomology Pretoria University (NMSA); 1♂, O.T.K. Reserve, Loskopdam, 25°27'S 29°24'E, [c. 1300 m], 4–11.xii.1985, Millar (NMSA); 1♀, Witbank [25°52'S 29°13'E c. 1593 m], 2529CC, iii.1979, Buitendag (NMSA); 1♂ 1♀, Melmoth District, Vergelegen farm, 28°32'S 31°21'E, 760 m, 4.ii.1986, Hurt, sitting on rock adjacent to stream (NMSA); 2♀, Kelvin Grove [c. 28°55'S 29°28'E c. 1210 m], 28°50'S 29°20'E, 20.xi.1993, Cradock, grass near river (NMSA); 2♂ 2♀, Mhlopheni Nature Reserve, 29°01'09"S 30°24'56"E, 900 m, 15.iii.2000, Londt & Dikow, *Acacia* thornveld (NMSA); 1♂, Injisuthi Nature Reserve, 29°07'29"S 29°26'24"E, 1470 m, 21–23.iii.2013, Londt, montane grass Proteas bridge area (NMSA); 2♂, Injasuti [= Injisuthi] Nature Res., 29°12'S 29°22'E [error – 29°07'S 29°26'E], 500 m [error – c. 1456 m], 26.iii.1994, Londt (NMSA); 1♀, Castleburn resort area, 29°44'17"S 29°17'36"E, 1650 m, 23.ii.2000, Londt, River Walk grassland river banks (NMSA); 1♀, Castleburn resort area, 29°44'22"S 29°17'58"E, 1620 m, 16.i.2014, Londt, Mlamboja River (NMSA); 3♂, Garden Castle Hotel area, 29°45'05"S 29°13'38"E, 1760 m, 14–16.i.2014, Londt, Stones, Mlamboja River (NMSA);

1♀, Castleburn resort area, 29°44'20"S 29°17'54"E, 1620 m, 19.iv.2014, Londt, Mlambonja River; 1♀, Mhlathuzana River, 29°48'S 30°45'E, 500 m, 18.xii.1990, Whittington & Londt, indigenous forest Jackson's Falls (NMSA); 1♂ 1♀, Pietermaritzburg, 30°36'S 30°22'E [unlikely and erroneous record], 1.xii.1994, Cradock (NMSA). TANZANIA: 1♂, 20 km N Uvinza [5°06'S 30°23'E, c. 1020 m], xi. 4 [or ii] 1964, Dudley (NMSA). ZIMBABWE: 1♂, Umtali [= Mutare c. 18°58'S 32°39'E c. 1100 m] District, Kebokon [? – indistinct], 12.x.1931 (NMSA).

Distribution (Fig. 17), phenology (Table 1) and biology: Although there are few records beyond South African borders, this is a fairly widely distributed species that is likely to be found at many places throughout the eastern parts of Africa. The species has been collected during every month from October to April (Table 1) and so it can be said with certainty that this is a summer-active asilid. I have collected this species on no fewer than 12 occasions and can testify to the fact that individuals are invariably found resting on rocks in and along streams and rivers. One such locality, in the scenic Drakensberg Mountains, is pictured here (Fig. 2). They are active fliers, which makes collection difficult (without falling into the water or getting the net drenched). My experience is backed up by a number of other collectors in the information provided on labels. Although some labels suggest that individuals may have been collected on vegetation, this is probably unlikely as I have not encountered them resting on vegetation (apart from dead twigs amongst riverine rocks). Interestingly enough, the species appears to be at home along rivers running through highly developed suburban places in the greater Johannesburg area, where streams are probably somewhat polluted. Little biological information is available.

Congomochtherus inachus Londt & Tsacas, 1987

Figs 3, 4, 7, 17

Congomochtherus inachus Londt & Tsacas, 1987: 33 (figs 3 postmetacoxal area, 19–24 ♂ terminalia, 25 ♀ terminalia).

Previously recorded material: Londt & Tsacas (1987) listed the following type material: SOUTH AFRICA: 1♀ (paratype), Cacudu River nr. Lady Frere, 3127CA, [c. 31°42'S 27°14'E, c. 1015 m], 27.x.1978, Londt & Miller, river bank (NMSA); 1♀ (paratype), Doringbos on Doring River, 3119CC, 500 ft, [c. 31°58'S 19°13'E, c. 170 m], 14.ix.1972, Irwin, riverbank sand dunes (NMSA); 1♀ (paratype), Olifantsrivier between Klawer & Clanwilliam, 3118DC [c. 31°59'S 18°45'E, c. 1020 m] (SAMC); 1♂ (paratype), Heuningklip River, 25 km W Queenstown, 3126DC, [c. 31°55'S 26°40'E, c. 1140 m], 27.x.1978, Miller & Londt, river bank (NMSA); 1♀ (paratype), 32 km NE Clanwilliam, 3219AA, [c. 32°04'S 19°04'E, c. 310 m], 2–13.x.1977, Miller, Brandewyn River (NMSA); 7♂ (holotype & paratypes) 4♀ (paratypes), Cradock, Fish River, 3225BA, [c. 32°10'S 25°37'E, c. 875 m], 28.x.1978, Londt & Miller, river bank (NMSA (HT 4♂ 2♀ paratypes)*, MNHN, BMNH); 6♂ 3♀ (paratypes), Klein-Vis Riv., 32 km NW Somerset East, 3225CB, [c. 32°30'S 25°26'E, c. 1040 m], 28.x.1978, Miller & Londt, river banks (NMSA); 4♂ 6♀ (paratypes), Klein-Vis Riv., 8 km W Somerset East, 3225CB, [c. 32°42'S 25°28'E, c. 810 m], 29.x.1978, Miller & Londt, river bank (NMSA); 1♂ (paratype), 1 km NW Somerset East, 3225DA, [c. 32°43'S 25°35'E, c. 805 m], 28–29.x.1978, Londt & Miller, picnic area stream (NMSA); 3♂ (paratypes), nr. Fullarton Station, Groot River, 3323BB, [c. 33°10'S 23°50'E, c. 595 m], 30.x.1978, Miller & Londt, river bank (NMSA); 2♂ 2♀ (paratypes), 7 km N Steytlerville, Groot River, 3324AB, [c. 33°15'S 24°23'E, c. 510 m], 30.x.1978, Londt & Miller, river bank & Field (NMSA).

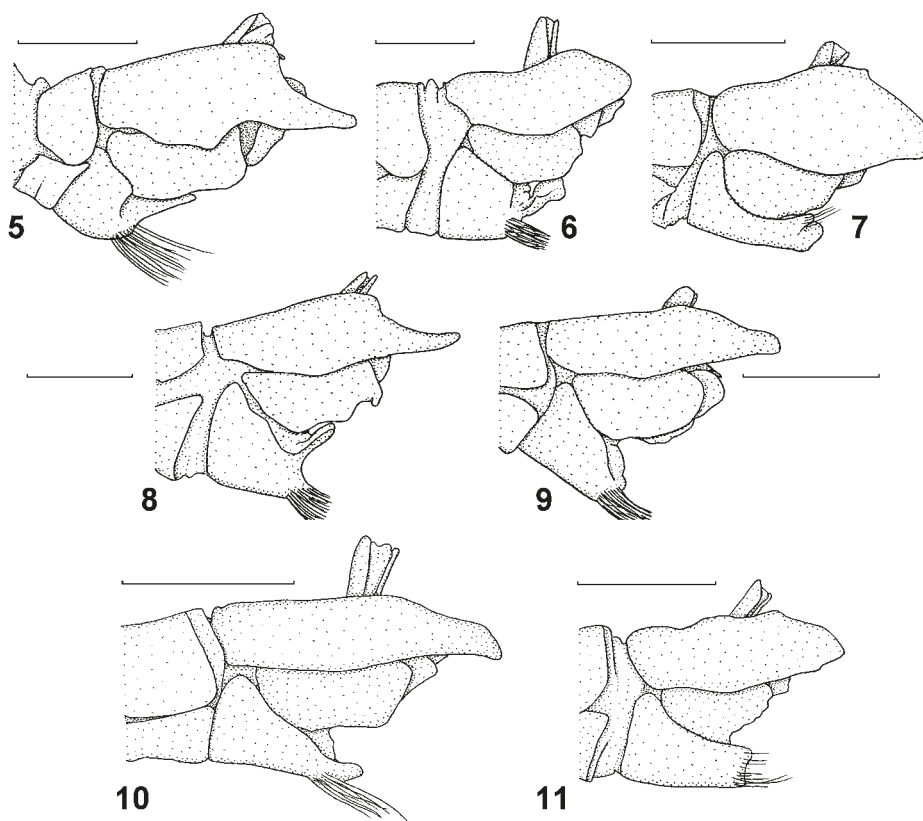
Newly recorded material: SOUTH AFRICA: 1♂, same data as holotype (NMSA); 1♂ 1♀, nr. Fullarton Station [as above] (NMSA); 4♂, 7 km NE Nieu Bethesda, 31°51'S 24°36'E, 1410 m, 11.x.1996, Londt, streamside rocks bush (NMSA); 2♂ 4♀, Nieu Bethesda village, 31°52'S 24°33'E, 1290 m, 11.x.1996, Londt, bush along dry river (NMSA); 14♂ 2♀, c. 2 km NE of Middelpos, 31°53'34"S 20°14'14"E, 1130 m, 17.xi.2011, Londt, Karoo scrub area and dam margins (NMSA); 2♂, c. 8 km SW of Middelpos, 31°57'07"S 20°11'11"E, 1175 m, 17.xi.2011, Londt, Karoo scrub area and dam margins (NMSA); 2♂, Renoster River area 18 km N of Sutherland, 32°15'10"S 20°41'39"E, 1290 m, 7.xi.1998, Londt, Karoo macchia (NMSA); 3♂ 1♀, Renoster River 18 km N Sutherland, 32°15.21'S 20°41.67'E, 1320 m, 19–20.xi.2008, Londt, rocky ridge stream edge (NMSA); 2♂ 1♀, 18 km N of Sutherland, 32°16'S 20°41'E, 1350 m, 26.xi.1990, Londt



Fig. 3. *Congomochtherus inachus* Londt & Tsacas, 1987, habitat (Dwyka River at bridge where N1 crosses, rocky river bed with stagnant pools).



Fig. 4. *Congomochtherus inachus* Londt & Tsacas, 1987, habitat (2 km NE of Middelpoort, dam margins).



Figs 5–11. *Congomochtherus* ♂ terminalia (lateral): (5) *C. acuminatus* Oldroyd, 1974; (6) *C. elferinki* Londt & Tsacas, 1987; (7) *C. inachus* Londt & Tsacas, 1987; (8) *C. lobatus* Oldroyd, 1970; (9) *C. oldroydi* Londt & Tsacas, 1987; (10) *C. penicillatus* (Speiser, 1910); (11) *C. potamius* Londt & Tsacas, 1987 (Scale bars = 1 mm).

& Whittington, Renosterrivier area (NMSA); 2♂, 35 km NE of Sutherland, 32°18'S 20°00'E, 1300 m, 27.xi.1990, Londt & Whittington, Rietriver bridge area (NMSA); 2♂, 18 km S of Sutherland, 32°32'16"S 20°37'09"E, 1390 m, 3–24.x.2004, Irwin, Parker & Hauser, Malaise in steep damp wash (NMSA); 1♂, 10 km S of Citrusdal, Koornlandskloof, 32°40'S 19°02'E, [c. 170 m], 5–9.x.1994, Söderlund, Malaise-trap, among shrubs at riverside (NMSA); 3♂ 7♀, Klein Visrivier, c. 10 km W Somerset East, 32°44'S 25°30'E, 800 m, 6.xii.1989, Londt, rocky ridge & stream (NMSA); 1♂ 5♀, Dwyka River N1, 33°05'07"S 21°34'46"E, 455 m, 13.x.2013, Londt, rocky river-bed with stagnant pools (NMSA); 3♂ 2♀, 5 km S of Laingsburg, 33°14'S 20°52'E, 700 m, 25.xi.1990, Londt & Whittington, banks Buffels River (NMSA); 3♂ 1♀, Meiringspoort area, Opmetings Drif, 33°21'14"S 22°32'36"E, 712 m, 14.x.2013, Londt, stony river margin (NMSA); 3♂, Meiringspoort area, Pereboom Drif, 33°22'02"S 22°33'15"E, 675 m, 14.x.2013, Londt, stony river margin (NMSA); 2♂ 1♀, 17 km N of De Rust, 33°22'S 22°33'E, 700 m, 23.xi.1990, Londt & Whittington, Meiringspoort area (NMSA).

Distribution (Fig. 17), phenology (Table 1) and biology: A South African endemic found in the Eastern Cape, Western Cape and Northern Cape provinces. This is the species that I am most familiar with as I have collected specimens on no fewer than 22 occasions. Like *elferinki* this species is encountered on rocks in rivers and streams. It was this species that first alerted me to this fairly unique behaviour amongst the Asilinae. So intrigued was I that I sent specimens and photos to Dr Léonidas Tsacas, then active at

the Muséum national d'Histoire naturelle, Paris, asking for his taxonomic opinion. His input eventually resulted in a joint publication (Londt & Tsacas 1987). This species has been collected during every month between September and December (Table 1). It is, however, likely to be active for the entire summer, although in the Western Cape, which lies in a region of winter rainfall, streams and dams may be low and this fact could curtail the species' activity. Little biological information is available. Apart from the flies behaving essentially like *elferinki* (see above), it also transpires that flies of both sexes will also come to rest along the muddy margins of largely dry river beds (such as the Dwyka River pictured in Fig. 3) or along the edges of dams where rocks are not available (such as the Middlepos dam pictured in Fig. 4). This is the only species for which there are prey records. 1♂ and 1♀ from the Klein Visrivier were captured while feeding on adult Empididae (NMSA prey records 0793 & 0974). These empids commonly fly over water surfaces and are therefore easily accessible prey.

Congomochtherus lobatus Oldroyd, 1970

Figs 8, 18

Congomochtherus lobatus Oldroyd, 1970: 305; Londt & Tsacas 1987: 35 (figs 26–32 ♂ terminalia).

Previously recorded material: Oldroyd (1970) recorded type material as follows: 'Holotype ♂. N. NIGERIA [no precise locality]: 1.v.1912 (J. W. S. McFie) (BMNH). Paratypes. CONGO: Kalembelembe [c. 04°31'S 28°44'E c. 1170 m] Baraka [c. 04°06'S 29°05'E c. 850 m], 2♂, 5♀, vii.1918 (R. Mayné); Manyama [? = Maniema c. 03°04'S 26°02'E c. 530 m], 1♂ (R. Mayné); UELE: Aba [c. 03°52'N 30°14'E c. 900 m], 1♂, 20.iv.1914 (Dr. Rodhain); Kapiri [c. 10°18'S 26°12'E c. 1230 m], 1♀, x.1912 (Miss. Agric.); TANGAN[Y] IKA: Mpata [= Mpala c. 06°45'S 29°30'E, c. 965 m – DRC not Tanzania], 780 m, 1♂, vii–viii.1953 (H. Bomans); KATANGA: Elisabethville [= Lubumbashi c. 11°34'S 27°21'E c. 1280 m], 1♂, ii.1929 (Dr. Bequaert) (MRAC).'

Londt & Tsacas (1987) listed the following material: CAMEROON: 1♀ (paratype), Nkolbison [Yaoundé environs c. 03°52'N 11°27'E c. 705 m], 5.xi.1969, de Miré (MNHN). DR CONGO: 2♂ (paratype), Uele, Aba [c. 03°52'N 30°14'E c. 900 m]; *Note*: Previously published coordinates are incorrect], 20.iv.1916, Rodhain (MRAC); 2♂ 5♀ (paratypes), Kivu. Kalembelembe [c. 04°31'S 28°44'E c. 1170 m] and Baraka [Baraka – c. 04°06'S 29°06'E, c. 850 m], vii.1918, Mayné, [? banks of Lake Tanganyika] (MRAC); 1♀ (paratype), Env. de Brazzaville [c. 04°16'S 15°17'E, 285 m], Roubaut & Weis, 1907 (MRAC); 1♂, Djoumouna [c. 04°23'S 15°10'E, c. 290 m], 4.xii.1971, Grillot (MRAC); 1♂ (paratype), Mpala [not Mpata as on label – 06°45'S 29°30'E, c. 965 m – DRC not Tanzania as cited by Oldroyd (1970)], 780 m, vii–viii.1953, Bomans (MRAC); 1♂ (paratype), North Katanga, Kanyama [not Manyama as on label – Kaniama c. 07°32'S 24°11'E, c. 890 m] (MRAC); 1♀ (paratype), North Katanga, Kapiri [c. 10°18'S 26°12'E c. 1230 m], x.1912, Miss Agric (MRAC); 1♂ (paratype), Katanga, Elisabethville (= Lubumbashi c. 11°40'S 27°29'E c. 1250 m), ii.1929 Bequaert (MRAC).

Newly recorded material: UGANDA: 1♂, Bwamba [c. 0°45'N 30°01'E, c. 780 m] Forest, 10.vii.1964, Dudley (NMSA).

Distribution (Fig. 18), phenology (Table 1) and biology: The species was originally described from Nigeria (no precise locality recorded), DR Congo and Tanzania. Londt and Tsacas (1987) added Cameroon to this list while the only new record known to me is from Uganda. Specimens of this species are remarkably data deficient. Not a single specimen label has any information relating to habitat occupied. Looking at the records from the water-rich, tropical DRC provides little insight into habitat preference as all the places mentioned are near major or minor rivers and streams. Baraka is perhaps the most interesting locality as the centre is found not too far from Lake Tanganyika, giving rise to the thought that the species may be found along the banks of this and other major African lakes. The record from Cameroon features part of the fairly large centre of Yaoundé. Google Earth shows a substantial stream passing through Nkolbison and

so it is tempting to believe that the specimen came from this stream. The record from Uganda is for a forested area well supplied with water, and so again the likelihood of an association with a stream is high. It appears that the species may be associated with forest streams.

Congomochtherus oldroydi Londt & Tsacas, 1987

Figs 9, 19

Congomochtherus penicillatus: Oldroyd 1970: 308.

Congomochtherus oldroydi Londt & Tsacas, 1987: 35 (figs 33–39 ♂ terminalia, 40 ♀ spermathecae).

Previously recorded material: Londt & Tsacas (1987) listed the following material: KENYA: 1♂ 1♀ (paratypes), between Guaso-Nyeri and Narosura [c. 1°18'S 36°14'E, c. 1400 m], 27.ii.1914 (BMNH); 1♀ (paratype), Masai Reserve [Masai Mara c. 1°29'S 35°08'E, c. 1560 m], Ngasemarok [?], A. D. Luckman, 6000' (BMNH); 2♂ (holotype & paratype), Narosura [1°32'S 35°51'E, c. 1860 m] River, xi.1912, Lowe, 1913 (BMNH).

Newly recorded material: KENYA: 1♀, Baringo, Lake Bogoria Nat. Res., 00°11'N 36°08'E, 1100 m, 21.xi.1992, Londt & Whittington, Fig Tree camp site (NMSA); 2♂ 1♀, Nakuru, Hell's Gate Nat. Park, 00°57'S 36°19'E, 1900 m, 26.xi.1992, Whittington & Londt, Ngorowa Gorge – stream (NMSA).

Distribution (Fig. 19), phenology (Table 1) and biology: This is currently a Kenyan endemic known from only five localities, two of which represent samples collected by me. I can, therefore, testify to the fact that this species was found resting on rocks on the banks of Lake Bogoria and in a stream running through the Ngorowa Gorge. Its behaviour closely resembles that of the southern African species. The Bogoria record is of particular interest as this lake, well known for its steaming geysers, has hot water, a fact that does not appear to have a negative impact on these flies. Although the species has been collected in November and February, known localities straddle the equator and it is probable that the species is active in the adult phase throughout the year. There are no prey records and biological information is confined to what has been said here.

Congomochtherus penicillatus (Speiser, 1910)

Figs 10, 19

Machimus penicillatus Speiser, 1910: 100; Lindner 1955: 40.

Congomochtherus penicillatus: Oldroyd 1970: 308 (= *oldroydi* Londt & Tsacas, 1987); Londt & Tsacas 1987: 37 (figs 41–47 ♂ terminalia, 48 ♀ terminalia).

Previously recorded material: Speiser (1910) based his species on: '4♂ und 6♀ aus der Niederung am Meru [Meru National Park, Kenya, c. 02°05'N 38°11'E, c. 570 m], davon 2♀ vom Ngare na nyuki [Ngare Nanyuki, Tanzania, c. 03°08'S 36°53'E, c. 1390 m]; die Funddaten sind: Oktober (I Expl.), 1. December (2), 2. Dec. (5), Januar (2).'

Lindner (1955) records the following material: '2♂ 6♀ von Ngaruka [nr. Loolmalasin Mountain, in Ngorongora Conservation area, Tanzania, c. 03°02' 56"S 35°49'15"E, c. 2040 m], 29. Januar bis 14. Februar 1952'.

Oldroyd (1970) recorded material from Kenya which was subsequently used in the description of a new species, *C. oldroydi* Londt & Tsacas, 1987.

Londt & Tsacas (1987) commented on the type material and listed the following record: TANZANIA: 2♂ 2♀, Bunduki [c. 07°02'S 37°38'E 1478 m], Uluguru Mts. moy. Mgeta, 1300 m, 30-iv/2-v-1957, Mission Zoolog. IRSAC en Afrique Orientale (P. Basilewsky & N. Leleup) (MRAC).

Newly recorded material: KENYA: 1♀, Machakos, Hunter's Lodge, 02°12'S 37°42'E, 960 m, 30.xi.1992, Whittington & Londt, hotel garden & lights (NMSA); 2♂ 2♀, Hunter's Lodge, 30.iv. – 2.v.1991, Friedberg & Kaplan (NMSA); 2♂, Kibwezi [c. 02°25'S 37°58'E, c. 900 m], 200 km S.E. Nairobi, 2, 7.xii.1989, Friedberg & Kaplan (NMSA).

Distribution (Fig. 19), phenology (Table 1) and biology: This species has been recorded for the northern parts of Tanzania (three localities) and southeastern Kenya (two

localities). Adults have been collected from October through to May, although there are no records for March (Table 1). Although the species is generally data deficient, my limited experience of collecting a single female specimen, found on a rock in the Kiboko stream where it crosses the A109 west of Hunter's Lodge (i.e. 02°12'28"S 37°41'55"E c. 930 m), is significant (*Note*: Label data is for the bulk of material which was collected in the area of the Lodge, and is inaccurate for this particular specimen). The identity of my specimen has been confirmed by the collection of both males and females by Friedberg and Kaplan in the same general area. The Ngare Nanyuki record is of interest as this centre lies in a valley between the Arusha National Park and Mount Kilimanjaro where a number of streams are to be found, one of which lies close to a main road [c. 03°07'59"S 36°52'57"E, c. 1370 m] and may be the site of collection. Although it appears that most records are for places near mountains where there are rivers and streams, no precise biological data is available for the species.

Congomochtherus potamius Londt & Tsacas, 1987

Figs 11, 17

Congomochtherus potamius Londt & Tsacas, 1987: 39 (figs 4 postmetacoxal area, 49–54 ♂ terminalia, 55 ♀ spermathecae).

Previously recorded material: *Londt & Tsacas (1987) listed the following type specimens*: SOUTH AFRICA: 2♂ 2♀ (paratypes), 10 km E Rhodes, bottom Naudesnek Pass [c. 30°47'S 28°00'E, c. 1850 m], 3028CC, 9.i.1979, Londt & Stuckenberg, river banks (NMSA); 7♂ (holotype & paratypes) 5♀ (paratypes), Rhodes area [c. 30°47'38"S 27°57'38"E, c. 1815 m], 3027DD, 9–10.i.1979, Londt & Stuckenberg, banks of river & hill near town (NMSA (holotype 5♂ 3♀ paratypes)*, MNHN, BMNH); 1♂ 1♀ (paratypes), Rhodes village [as above], 9.i.1979, Londt & Stuckenberg, river banks on stones (NMSA).

Newly recorded material: SOUTH AFRICA: 1♂, 10 km ENE of Rhodes, 30°45'S 28°01'E, 2080 m, 5.ii.1992, Natal Museum Expedition, causeway near Malpas (NMSA); 4♂ 2♀, Bell River at Rhodes, 30°48'S 27°58'E, 1825 m, 5.ii.1992, Natal Museum Expedition, trees grass & riverine (NMSA).

Distribution (Fig. 17), phenology (Table 1) and biology: This South African endemic is confined in its distribution to a small area in the vicinity of the village of Rhodes in the southern Drakensberg Mountains of the Eastern Cape Province. I collected all available specimens on two trips to the area in January and February (Table 1). It is probable that the species is active for much of summer in this summer-rainfall region. All specimens were found resting on rocks in the Bell River, which flows along the northern boundary of Rhodes. Efforts to find examples in the vicinity adjacent to the stream were fruitless. The habitat closely resembles that described for *elferinki*. There is no biological data apart from that appearing on labels.

STATUS OF *HELIGMONEVRA RUFINOTA* MARTIN, 1964

Heligmonvra rufinota Martin, 1964 **Stat. Rev.**

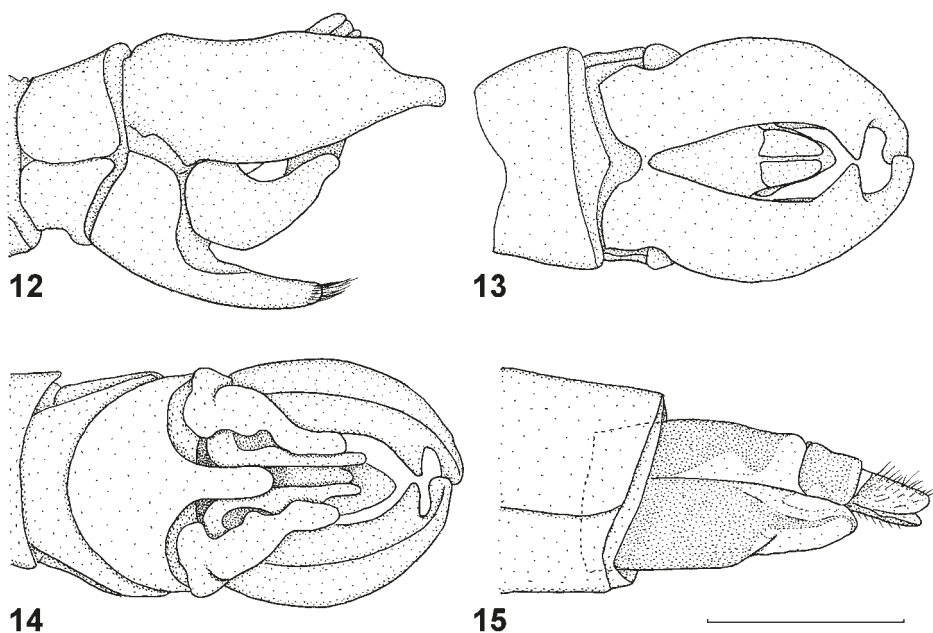
Figs 12–15

Heligmonvra rufinota Martin, 1964: 304 (figs 73 mesonotum, 83 ♂ terminalia).

Heligmonvra rufinota: Oldroyd 1980: 338 (catalogue).

Congomochtherus rufinota: Tomasovic 2006: 148 (figs 6 epandrium, 7 gonocoxite & dististylus, 8 hypandrium, 9 aedeagus).

Martin (1964) described this Madagascan species from the type locality of Ambalavao [c. 21°14'S 47°14'E c. 1280 m] and five other localities on the island. In the absence of a modern review of *Heligmonvra*, Tomasovic (2006) transferred *H. rufinota* to *Congomochtherus* after studying material (9♂ 9♀) from Morarano Chrome, collected by



Figs 12–15. *Heligmonevra rufinota* Martin, 1964: (12–14) ♂ terminalia (lateral, dorsal, ventral); (15) ♀ terminalia (lateral) (Scale bars = 1 mm).

A. Pauly and housed in GULB. As this was the first record of the genus from Madagascar, I borrowed two pairs of specimens from GULB in order to satisfy my curiosity regarding Tomasovic's action. While I can confirm the specific identification to be *H. rufinota*, as the males possess the hypandrium uniquely tapering to a point (Figs 12, 14), I am not convinced that the species is correctly assigned to *Congomochtherus* and so here reassign it to *Heligmonevra*, where I believe it should reside, at least until a thorough revision of the genus has been undertaken. The Morarano Chrome specimens key out well to *Heligmonevra* using a key to the genera of Asilinae published by Londt (2002). There are currently 24 described Afrotropical species, 14 of which are Madagascan endemics (*Note*: Martin's (1964) study included 16 species, two of which have since been transferred to other genera).

In general appearance *Congomochtherus* species are far more robust and darkly pigmented than *Heligmonevra* species, which are rather slender and much paler in colour. While these genera are similar, the specimens of *H. rufinota* do not agree with *Congomochtherus* species in a variety of features: (1) In *H. rufinota* the antennal style appears 2-segmented—the small basal segment-like element is not clearly defined (in *Congomochtherus* this element is reasonably distinct). (2) In *H. rufinota* all femora are slender and predominantly yellowish except for small dark-brownish areas (in *Congomochtherus* all femora are fairly robust and entirely to very extensively blackish). (3) In *H. rufinota* the thoracic pruinescence is strongly developed (in *Congomochtherus* species it is weakly developed). (4) In *H. rufinota* the face is only slightly ventrally protuberant (in *Congomochtherus* the face is obviously protuberant). (5) In *H. rufinota*

the female terminalia (Fig. 15) are relatively weakly sclerotised, in particular the hypogynial valves, and cerci are finely setose (in *Congomochtherus* the female terminalia are strongly sclerotised and the cerci commonly have short spine-like setae).

Material examined: MADAGASCAR: 2♂ 2♀ Morarano [19°26'S 47°29'E c. 1550 m] – Chrome, i.1992, A Pauly (GULB).

Key to the species of *Congomochtherus*

This key, modified from that of Londt and Tsacas (1987), includes a few additional characters. Identifications should be checked by comparing male terminalia with the illustrations provided (Figs 5–11), in addition to those supplied by Londt and Tsacas (1987).

- 1 Katatergal macrosetae predominantly black (accompanied by few, fine white setae) (♂ terminalia as Fig. 8) (Central Africa) **lobatus** Oldroyd, 1970
- Katatergal macrosetae yellow-white 2
- 2 Antennal setae primarily black, a few white basoventrally on scape; postmetacoxal area membranous (bridge absent); female cerci with short spine-like setae (East & southern Africa) 3
- Antennal setae primarily white, a few black distolaterally; postmetacoxal area bridged by a sclerotised bar; female cerci fine setose only (South Africa) 6
- 3 All femora with short brown-orange region proximally (East Africa) 4
- Femora uniform black (tiny patches of orange colour may be seen but never on all femora) (southern Africa) 5
- 4 Anatergal setae black; T1 with at least a few black macrosetae laterally; hypandrium with subapical tuft of black setae (♂ terminalia as Fig. 10) **penicillatus** (Speiser, 1910)
- Anatergal setae white; T1 with white macrosetae only; hypandrium with apical tuft of white setae (♂ terminalia as Fig. 9) **oldroydi** Londt & Tsacas, 1987
- 5 Mystax occupying more than half the distance between antennal bases and lower facial margin; male terminalia mainly black, hypandrium with a pair of black, narrowly separated setose tufts distomedially (♂ terminalia as Fig. 6) (widespread southern Africa & East Africa) **elferinki** Londt & Tsacas, 1987
- Mystax occupying a little less than half the distance from antennal bases to lower facial margin; male terminalia mainly red-brown, hypandrium with a pair of white, widely separated setose tufts distally (♂ terminalia as Fig. 5) (Namibia & Angola). **acuminatus** Oldroyd, 1974
- 6 At least a few white setae on posterior part of ocellar tubercle; mystax occupying more than half the distance from antennal bases to lower facial margin; male hypandrium with longish, black macrosetae distolaterally (♂ terminalia as Fig. 7) (South Africa: Western, Eastern and Northern Cape) **inachus** Londt & Tsacas, 1987
- Ocellar setae all black; mystax occupying less than half the distance from antennal bases to lower facial margin; male hypandrium with short, white setae distolaterally (♂ terminalia as Fig. 11) (South Africa: Eastern Cape) **potamius** Londt & Tsacas, 1987

DISCUSSION

Taxonomy and relationships

Congomochtherus was reasonably well reviewed by Londt and Tsacas (1987) and presently includes the seven species listed in the key above.

Dikow (2009) included *Congomochtherus* in his important phylogenetic analysis. When asked to comment on his findings in respect of the genus, he had this to report (pers. comm.):

‘*Congomochtherus* was in my analysis one of the many unresolved Asilinae genera and I can’t really say much about its closest relatives. The three unique characters based on my figure 123 (in the 2009 monograph) are:

49:0 – macrosetae on lateral margin of frons absent.

164:1 – female with marginal macrosetae on T6 (discal setae of previous authors).

199:1 – male with hypandrium as a well-developed, triangular-shaped sclerite.

Note that these features might occur in other Asilinae, but not in this combination. Also in figure 123 you can see that *Congomochtherus* is sister genus to *Philonicus* Loew, 1848.

Rodrigo Vieira’s as yet unpublished phylogenetic analysis of the Asilinae, which was his dissertation defended in 2013, shows a similar result. In conclusion, I think it is fair to say that *Congomochtherus* and *Philonicus* Loew, 1849 are closely related and I have collected the latter in New Mexico along a stream as well. However, not all species might share this habitat as *Philonicus albiceps* (Meigen, 1920) in Europe is not found along streams.’

Although Dikow’s comments regarding the possibility of a close relationship with *Philonicus* are of interest, I have no experience of the genus as it does not occur in the Afrotropics. However, another more distantly related genus, *Philodicus* Loew, 1848, included by me (Londt 2005) in the subfamily Apocleinae but transferred to the Asilinae by Dikow (2009), also appears to favour wet habitats, as some species may be collected in vegetation bordering streams and dams while others may be found resting on the ground in pans (periodically dry depressions where water accumulates after rain). Further work on the phylogenetic relationships between these genera is clearly desirable.

Distribution and biology

The genus occurs widely throughout much of eastern, central and southern Africa (Fig. 16). While *lobatus* occurs in areas where tropical forests occur (Fig. 18) (and may be generally darker in coloration as a consequence), most species inhabit more open biomes. Some species (e.g. *elferinki* & *inachus*) are fairly widely distributed (Fig. 17) while others (e.g. *acuminatus* & *potamius*) may be confined to relatively small regions (Fig. 17). The East African species, *oldroydi* and *penicillatus*, appear to have distributions that abut (Fig. 19) and it would be interesting to know what factors contribute to their separation.

The close association between species of *Congomochtherus* and watery habitats appears undisputed. Londt (1994) in his ‘ecological classification’ of Afrotropical Asilidae mentions a number of genera that live in close association with water, both marine and fresh. Of particular interest is an exceptional species in the huge genus *Neolophonotus* Engel, 1925, *N. io* Londt, 1986, that appears to behave in an identical manner to

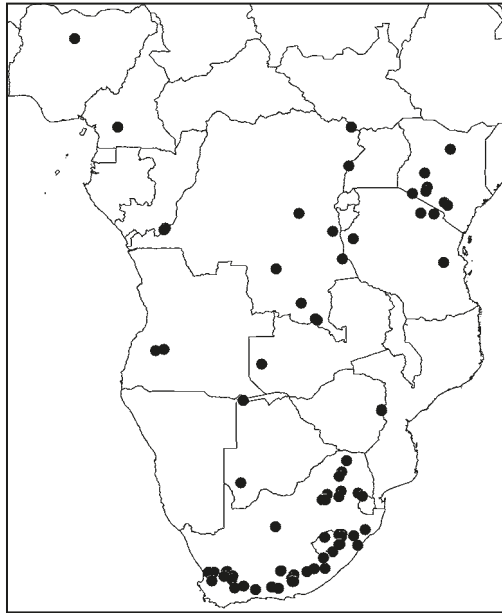


Fig. 16. Distribution of *Congomochtherus* Oldroyd 1979 – all records (Note: N. Nigerian record estimated).

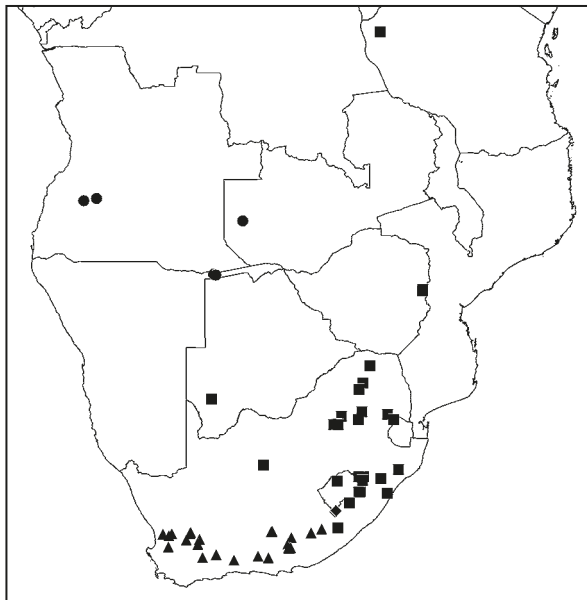


Fig. 17. Southern African distribution of *Congomochtherus* Oldroyd 1979: *C. acuminatus* Oldroyd, 1974 (circles); *C. elferinki* Londt & Tsacas, 1987 (squares); *C. inachus* Londt & Tsacas, 1987 (triangles); *C. potamius* Londt & Tsacas, 1987 (diamond).

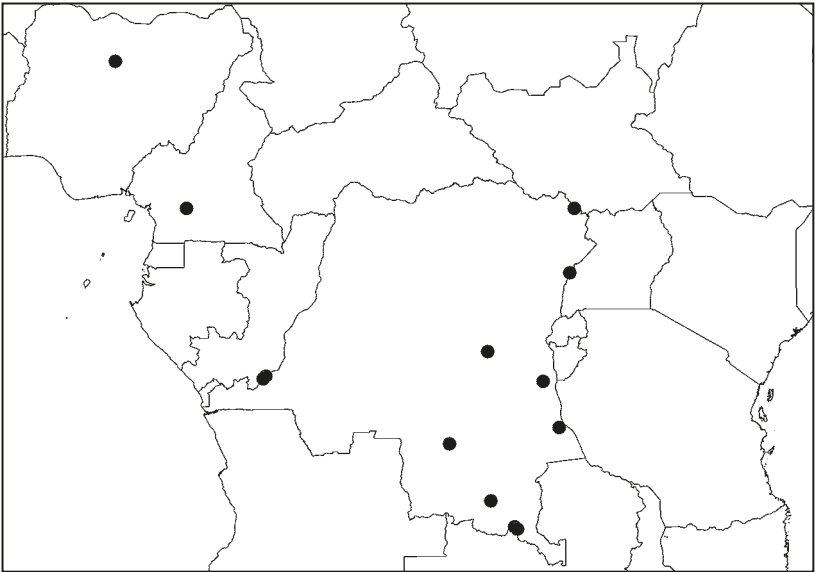


Fig. 18. Central African distribution of *Congomochtherus lobatus* Oldroyd, 1970 (Note: N. Nigerian record not a precise place).

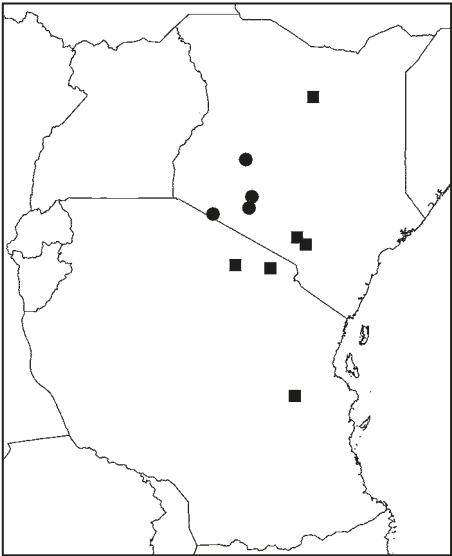


Fig. 19. East African distribution of *Congomochtherus oldroydi* Londt (circles) & Tsacas, 1987 and *C. penicillatus* (Speiser, 1910) (squares).

C. elferinki and is found at the same habitats in the Drakensberg Mountains of South Africa. Other genera with species that live in habitats involving fresh water are *Stichopogon* Loew, 1847 and *Philodicus* (see comments above). *Stichopogon* species, however, are almost invariably found resting on dry sandy ground along the banks of rivers and streams. Both *Stichopogon* and *Philodicus* are genera that oviposit into sandy substrates and have ovipositors designed to do this.

The close association between *Congomochtherus* and watery habitats is intriguing and it would be instructive to know exactly where these flies oviposit and where their larvae develop. Rivers and streams could be viewed as hospitable habitats in that they are prone to flooding, especially those in the mountainous habitats with which some species are commonly associated. Their ovipositors suggest that eggs may be buried in the ground (i.e. they are robust, tubular, and many species have short, spine-like setae that might assist in burying eggs in sandy soil) as opposed to being deposited in or on vegetation, as appears to be the norm within the subfamily as a whole. While eggs are most likely to be laid in damp soil, it remains possible that they could be pasted onto rocks on the banks of streams such that emerging larvae fall onto and then burrow into damp soil. Clearly this is an interesting project awaiting attention.

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