Compared to the western Palaearctic and most of the Nearctic, the taxonomy of the midge family Chironomidae from the Afrotropical region is poorly known. Generic relationships of many species are uncertain because their immature stages, often necessary for delimiting genera, are unknown, in spite of their ecological importance in African fresh waters. Here we report on reared material of several problematic species that require establishment of a new genus.

Goetghebuer (1936) placed a newly described Afrotropical species, *Chironomus regalis* Goetghebuer, 1936 (selected as type-species for *Acinoretracus*); *Ch. (Dicrotendipes) multispinosus* Freeman, 1957; *Ch. (D.) penicillatus* Freeman, 1957; and *Ch. (D.) crispis* Freeman, 1957. The adult male and female, pupa and larva are described and figured for *A. multispinosus* and *A. penicillatus*, and notes are given for the other two species. *Acinoretracus* is very close to *Kiefferulus* but can be distinguished by the following characters: adult male: superior volsella with dense apical brush of long, fine setae, without large setae; inferior volsella with narrowed, upturned apex bearing several apical setae; adult female: gonocoxite IX vestigial, without setae; pupa: cephalic tubercles low, rounded; thoracic horn base with anteriorly directed flange-like lobe; long, taeniate ventral antepronotal and anterior precornal setae; pedes spuri B and larval ventral tubules absent; larva: S1 plumose on inner side only; mentum with first and second lateral teeth not fused; short and wide, medially contiguous ventromental plates, with basally forked striae; mandible with rugose lateral margin and U shaped pecten mandibularis; lateral and ventral tubules absent.

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Key words. – Diptera; Chironomidae; taxonomy; *Acinoretracus*; *Kiefferulus*; *Dicrotendipes*; Afrotropical.

### ACINORETRACUS, A NEW AFROTROPICAL GENUS FOR SOME SPECIES PREVIOUSLY PLACED IN DICTROTENDIPES (DIPTERA: CHIRONOMIDAE: CHIRONOMINAE)


A new genus, *Acinoretracus*, is established for four Afrotropical species previously placed in *Dicrotendipes*. These species are *Chironomus (Carteria) regalis* Goetghebuer, 1936 (selected as type-species for *Acinoretracus*); *Ch. (Dicrotendipes) multispinosus* Freeman, 1957; *Ch. (D.) penicillatus* Freeman, 1957; and *Ch. (D.) crispis* Freeman, 1957. The adult male and female, pupa and larva are described and figured for *A. multispinosus* and *A. penicillatus*, and notes are given for the other two species. *Acinoretracus* is very close to *Kiefferulus* but can be distinguished by the following characters: adult male: superior volsella with dense apical brush of long, fine setae, without large setae; inferior volsella with narrowed, upturned apex bearing several apical setae; adult female: gonocoxite IX vestigial, without setae; pupa: cephalic tubercles low, rounded; thoracic horn base with anteriorly directed flange-like lobe; long, taeniate ventral antepronotal and anterior precornal setae; pedes spuri B and larval ventral tubules absent; larva: S1 plumose on inner side only; mentum with first and second lateral teeth not fused; short and wide, medially contiguous ventromental plates, with basally forked striae; mandible with rugose lateral margin and U shaped pecten mandibularis; lateral and ventral tubules absent.

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Key words. – Diptera; Chironomidae; taxonomy; *Acinoretracus*; *Kiefferulus*; *Dicrotendipes*; Afrotropical.
lesser extent coloration, between these two species and *D. crispi* (Freeman, 1957) and *D. regalis* (Goetghebuer, 1936) allow the latter two species to also be included in this grouping. In this paper, the new genus name *Acinoretacus* is proposed for those four Afrotropical species removed from *Dicrotendipes*. The adult stages are redescribed, and the pupa and larva described for the first time, for *A. multispinosus* and *A. penicillatus*.

**Methodology**

Morphological terminology and abbreviations follow Sæther (1980), Epler (1988) and Langton (1994). For the anteromedian circular area of thinner cuticle on the larval frontal apotome we adopt the term apotomal fenestra, as suggested by Epler in Cranston (1996). This structure is distinct from the frontal pit found in *Dicrotendipes*, although some *Dicrotendipes* (and other genera, such as *Glyptotendipes*) may possess an apotomal fenestra (see Cranston 1996 and Epler 1987, 1988).

Other abbreviations used: BMNH = British Museum (Natural History).

Measurements are in µm, unless otherwise stated, and consist of the range followed by the mean if more than three specimens were measured. In the description of *Acinoretacus multispinosus*, data from Amakye & Sæther (1993) are included in brackets ([]) if they were outside of the range of the measurements performed in this study; some data from their redescription are also incorporated into the description of the genus below.

**Systematics**

*Acinoretacus* Epler, Harrison et Hare gen. n.

Type-species: *Chironomus (Carteria) regalis* Goetghebuer, 1936: 465, by present designation.

**Etymology**

An anagram of *Carteronica*. Gender masculine.

**Adult male**

Medium-sized species, wing length about 1.6-3.0 mm; general colouration yellowish-brown to brown, thorax with dorsal median dark stripe extending from front to postnotum; abdomen with darker posterior bands and/or median lines/triangles or almost completely dark; wings unmarked.

**Head.** – Eyes bare, with dorsomesal extension. Temporal setae uniserial, beginning mesad to dorsomesal eye extension and running behind the eyes. Antennae with 11 flagellomeres; AR about 2.0-3.0. Frontal tubercles minute/vestigial. Clypeus subquadrate, setose.

Cibarium with internal sensillae. Maxillary palp with 5 palpomeres, palpomere 1 weakly sclerotized; palpomere 3 with 5-8 subapical sensilla clavata.

**Thorax.** – Antepronotum bare, lobes dorsally divided. Scutum not extending over antepronotum, scutal tubercle not present. Humeral pit obsolete; thoracic scar moderately developed. Acrostichal setae long, beginning close to antepronotum, 6-20; dorso-centric setae 7-14/side, uniserial; prealar setae 4-6/side; with one supraalar seta/side. Scutellum with 6-17 setae, uniserial.

**Wing.** – Membrane without macrotrichia, with moderate punctuation of microtrichia. Brachiolium with 2-3 setae and proximal and distal groups of sensilla campaniformia. Anal lobe well developed, apex of wing rounded or slightly truncate. Veins R, R1 and R4+5 with setae; squama with setae. Costa not extended. Apical and posterior subapical margin of wing with scale-like setae.

**Legs.** – Apex of foretibia with rounded scale, without spur; foretarsus without beard. Middle and hind tibiae each with two combs; middle combs each with 1 spur; hind combs with inner comb with 1 spur, outer with 1-6 spurs. Sensilla chaetica present on apical ⅔ of metatarsus of middle leg, sometimes with sensilla chaetica on metatarsus of hind leg. Tarsal claws simple; empodium well developed; pulvilli small, simple, about ½ length of claw.

**Abdomen.** – With moderate coverage of long setae, arranged in loosely transverse rows.

**Hypopygium** (figs. 1, 8). – Anal tergal bands strong, converging before anal point and continuing onto point as a ridge. Anal point broad or narrow, downturned apically and sometimes hooked. Median anal tergite setae present or absent between dorsal ridges at base of anal point, lateral setae present along base of anal point. Superior volsella with short to elongate cylindrical base, with dense apical brush of long, fine setae, without large sensilla chaetica (setae); apex sometimes bifid. Median volsella absent or present as small wart-like protuberance that bears 4-10 long setae. Inferior volsella with narrowed, upturned apex bearing several apical setae, volsella sometimes swollen dorsally before apex. Gonostylus semi-quadrate and bulbous, sometimes with weak crista ventralis and a moderately to well developed thinner outer heel, or gonostylus more elongate and strongly curved medially, without crista ventralis or apical heel.

**Adult female**

As in the male, with following differences:

**Head.** – Antenna with 5 flagellomeres; AR about 0.33-0.46.

**Thorax.** – With about 2 humeral setae (anterior-most dorso-centric setae).

**Wing.** – Slightly stouter than in male, with more
Genitalia (figs. 11, 12). – Gonocoxite IX vestigial, without setae. Gonapophysis VIII with well developed dorsomesal and ventrolateral lobes. Apodeme lobe well developed, with dense microtrichria. Labia without microtrichria. Seminal capsules ovoid with a short neck; spermathecal ducts without loops or bends.

Pupa
Exuviae brown, margins darker.

Cephalothorax. – Cephalic tubercles low, rounded; frontal setae small (fig. 15). Dorsum mostly smooth, with longitudinal row of tubercles, some of which are sharply pointed. Thoracic horn plumose; base reniform, with anteriorly directed flange-like lobe, with 2 tracheal bundle scars (fig. 17). Dorsal anteropleural seta very long and taeniate, with anteriorly directed flange-like lobe, with 2 tracheal bundle scars (fig. 17). Four dorsocentral setae; Dc1 and Dc2 close, Dc3 and Dc4 close; Dc1 and Dc4 thicker than Dc2 and Dc3.

Abdomen (fig. 18). – An uninterrupted row of posterior hooklets on T II, about ½ width of segment. S II and III with posterior transverse median band of long spines. Pedes spurii A present on S IV; pedes spurii B absent. Segment VIII with dark caudal lateral, with 1-4 large spurs and 1-5 smaller spines or spines; without ventral tubules. Setation: Each side of segment I with 1 lateral seta; II-IV with 3 lateral setae; V-VII with 4 lateral taeniae, these arranged with first two closer together on anterolateral margin and last two closer together on posterolateral margin; VIII with 5 lateral taeniae; anal lobe with a pair of dorsal taeniae and a biserial fringe of about 80-130 taeniae/side. Tergites and sternites with one pair of 0-setae. Shagreen: T I bare; T II-V (VI) with a mostly continuous field of points which become progressively larger posteriorly, weaker towards midline so that posterior points appear in two groups, on T III-VI these posterior shagreen groups slightly elevated above rest of integument; T VI sometimes with anterior and posterior fields of points, largest points in posterior portion of posterior field; T VII-VIII with anterior pair or transverse band of points, weaker on T VIII; anal disc without shagreen. Conjunctives III-IV, IV-V, V-VI with fine spinules. Pleura of II-III (IV) with longitudinal bands of fine to coarse spinules. S I bare; S II-V with scattered fine spinules; S VI-VII (VIII) with anterior patches of fine spinules.

Larva
Head capsule yellow/yellow-brown, with darker posterior margin, mentum, premandibles and mandibular teeth. Two pairs of eyespots. Body usually whitish in life but some specimens with red pigment; claws brown.

Head. – Antenna (fig. 30) with 5 segments. Ring organ in basal third of basal segment. Antennal blade shorter than flagellum; accessory blade short, about ½ length of segment 2. Style and Lauterborn organs present at apex of segment 2.

Dorsum of head either with frontoclypeal apotome and labral sclerite 2 (fig. 26), or frontal apotome and labral sclerites 1 and 2, with anterior margin of frontal apotome indistinct (fig. 23); apotome with anteromedian fenestra. Labrum (fig. 28) with S I plumose on inner side only; S II simple and on short pedestal; S III simple; S IVA minute, 2-segmented; S IVB simple, shorter than S IVA. Labral lamella with marginal fringe. Pecten epipharyngis simple, with 9-16 pointed teeth, no teeth on surface. Premandible (fig. 31) with 5-6 teeth, brush well developed.

Mandible (fig. 32) with rugose outer margin, a pale dorsal preapical tooth and dark apical and three inner teeth. Pecten mandibularis composed of about 12 coarse setae arranged in U shape. Seta subdenticilis (fig. 33) apically widened with numerous fine apical teeth. Seta interna plumose, with four main branches.

Mentum (figs. 24, 27) with 13 teeth, median tooth trifid and lower than first lateral teeth; first lateral teeth separate from seconds. Ventromental plates short and wide, 3.5-4.0× wider than long, contiguous or nearly so medially; with smooth anterior margin; most striae complex, fork-like, with several branches arising from base of each stria (fig. 25); innermost and outermost striae simple. Seta submenti simple, at base of ventromental plates. Maxilla (fig. 29) without serrate lacinial chaetae; maxillary palp about twice as long as wide and with very long a seta. Triangulum occipitale wide.

Body. – Anterior parapods with simple and pectinate claws; posterior parapod claws simple. Lateral and ventral tubules absent. Procerci slightly longer than wide, each with 2 minute basal setae and 7-8 moderately long apical setae. Supraanal setae fine, slightly shorter than anal tubules. Two pairs of anal tubules, about 3× as long as wide.

Remarks
When all life stages are considered, Acinoretacus can be seen to be very close to Kiefferulus, not Axarus or Lipiniella as suggested by Hare in Cranston, et al. (1990). Kiefferulus has recently been expanded by the inclusion of several species previously assigned to other genera (Cranston et al. 1990); they (ibid.: 421) presented an emended diagnosis for the genus. Note that in their listing of included species, the authors omitted the South African species K. nigropunctatum (Freeman, 1957) (O. A. Sæther personal communication), K. modocensis (Sublette, 1960), a western Nearctic species; and Epler (1995) recently moved Chironomus pungens (Townes, 1945), an eastern Nearctic
species, to *Kiefferulus*. The diagnosis of Cranston et al. (1990) is already in need of further emendation, for, as noted below, an undescribed southern Nearctic species of *Kiefferulus* has been found in which the larval ventromental plates are contiguous medially. One of us (ADH) is not in complete agreement with their synonymy of some African *Nilodorum* species with *Kiefferulus*.

While some life stages (the female) of *Acinoretacus* may not be clearly separable from *Kiefferulus* as currently defined, the complete suite of characters taken from all life stages demonstrates the generic uniqueness of *Acinoretacus* from *Kiefferulus*. These differences include:

Adult male: superior volsella with dense apical brush of long, fine setae, without large setae; inferior volsella with narrowed, upturned apex bearing several apical setae. No described species of *Kiefferulus* possesses such genitalia. Two species, *A. multispinosus* and *A. regalis*, possess a rudimentary median volsella that bears several large setae.

Adult female: gonocoxite IX vestigial, without setae. Sæther (1977: 170) describes the female genitalia of *Kiefferulus* with gonocoxite IX ‘small, with about 2 setae’. However, Cranston et al. (1990: 423) noted that in *K. longilobus* gonocoxite IX is small and apparently without setae; while Harrison (1996: 10) found ‘gonocoxite IX large with about 10 setae’ in *K. chloronotus* (Kieffer).

Pupa: cephalic tubercles low, rounded; thoracic horn base with anteriorly directed flange-like lobe; long, taeniate ventral antepronotal and anterior precornal setae; pedes spurii B and larval ventral tubules absent. Note that while in Holarctic *Kiefferulus* the precornal setae are subequal, in the Afrotropical
species *K. fractilobus* (Kieffer), the posterior pre- 
corneal seta is much larger and taeniate (JHE, unpub- 
lished data based on rearings from Nigeria by LH).

Larva: S I plumose on inner side only; mentum with 
first and second lateral teeth not fused; short and 
wide, contiguous ventromental plates, with forked 
striae; mandible with rugose outer margin and U 
shaped pecten mandibularis; ventral tubules absent. 
Pinder & Reiss (1983) and Cranston et al. (1990) di-
agnose *Kiefferulus* larvae as having medially separated 
ventromental plates. However, an undescribed south-
earctic species (*Kiefferulus* sp. A in Epler 1992, 
1995) has contiguous ventromental plates. This 
species has been reared by JHE and has a pupa and 
adult very similar to *K. dux* (Johannsen). Note that 
the ventromental plate striae of *K. sp. A are simple, 
not forked as in *Acinoretracus* (fig. 25).

It can be hypothesized that *Acinoretracus* and *Kie-
fferulus* form a sister group within the *Chironomus* 
group (as defined by Epler 1988: 194), but the nature 
of the relationships between *Kiefferulus* and related 
genera must await a world-wide revision of *Kiefferu-
lus*, utilizing characters from all life stages.

**Acinoretracus multispinosus** (Freeman) comb. n. 
(figs. 1-7, 14, 17-22, 23-25)

*Chironomus* (*Dicrotendipes*) *multispinosus* 
Freeman 1957: 373 (original description of adult male).

*Dicrotendipes multispinosus* (Freeman). Freeman 
& Cranston 1980: 190 (catalog).

'Carteronica' *multispinosus* Freeman. Cranston et al. 
1990 (larval ventromental plates).

*Dicrotendipes multispinosus* (Freeman). Amakye & Sæther 
1993 (redescription of adult male; description of adult fe-
male).

**Description**

The male of this species was recently redescribed by 
Amakye & Sæther (1993); they also described the fe-
male in detail. Some of their data are included below 
brackets in the descriptions of those life stages.

Adult male (n=4-5). – Colour. Head yellowish-
brown, antennae light brown; thorax yellowish with 
dark median stripe extending from front of scutum to 
postnotum; wings unmarked, pale yellowish-brown; 
haltere pale; legs yellowish with femoral apices brown, 
bases and apices of tibiae brown; abdomen yellowish 
with brown posterior triangular areas/bands, tergite 
VIII and hypopygium almost completely brown.

Length. Total 3.63-4.60, 4.21 mm [3.31-4.48, 
3.98 mm]; thorax 0.90-1.03, 1.02 mm; abdomen 
2.73-3.58, 3.19 mm.

Head. Frontal tubercles 2.5 long. Temporal setae 
12-19; clypeal setae 12-23, 18; cibarial sensilla 4-8. 
Lengths of palpomeres 1-5: 43-50 [30-56, 44]; 45-47 
[37-52, 47]; 128-150 [135-168, 152]; 145-165 [150-
179, 165]; 200 [233-248, 235]. AR 2.79-2.78 [2.28-
2.60, 2.48].

Thorax. Setae: acrostichals 7-18 [6-9, 8]; dorsocen-
trals 10-11, 10 [7-14, 9]; prealars 5 [4-5, 5]; scutellars 
8-16 [6-12, 9].

Wing. Wing length 1.63-2.10, 1.86 mm [1.74-
2.02, 1.88 mm]; width 0.44-0.61 mm. VR 1.16-
1.24. Setae: R 20-34; R1 17-26; R4+5 20-39; squama 
4-9 [6-10]. Wing apex rounded (fig. 14).

Legs. Tarsomere 1 of middle leg with 7-10 sensilla 
chaetica; tarsomere 1 of hind leg with 0-1 sensilla 
chaetica. Lengths and proportions of legs see Table 1.

Hypopygium (fig. 1). Superior volsella cylindrical, 
shaft bare but with expanded pad with dense brush of 
long setae apically (figs. 4, 5), or apex bifid (figs. 2, 3, 
6). Median volsella reduced to small protuberance, 
with [4]5-10, 7 large anteromedially directed setae. 
 Inferior volsella with narrowed, upturned apex, bear-
ing 3-7 large setae and several smaller setae; volsella 
dorsally expanded preapically (fig. 7). Gonostylus 
bulbous/quadrate, with crista ventralis. Anal point 
ridge bearing 2-5 setae; anal point with 8-12 smaller 
lateral setae.

Adult female (n=1). – Colour. Similar to male. 
Length. Total 4.00 mm [4.62 mm]; thorax 1.15 
mm; abdomen 2.85 mm.

Head. Frontal tubercles 2.0 long. Temporal setae 
16; clypeal setae 18; cibarial sensilla 14. Lengths of 
palpomeres 1-5: 45 [56]; 52 [56]; 150 [180]; 155 
[184]; 250 [263]. AR 0.46 [0.45].

Thorax. Setae: acrostichals 14; dorsocentra1ls 11 + 2 
numerals [16], 10; prealars 5; scutellars 15 [13].

Wing. Wing length 1.90 mm; width 0.65 mm. VR 
1.17 [1.19]. Setae: R 20-34; R1 17-26; R4+5 20-39; squama 
14 [12].

Legs. Tarsomere 1 of middle leg with 19 sensilla 
chaetica; tarsomere 1 of hind leg with 10 sensilla

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**Table 1. A. multispinosus male: lengths and proportions of legs (n = 1-2).**

<table>
<thead>
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<th>P2</th>
<th>P3</th>
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<td>[1420] 1480</td>
<td>[457] 520</td>
<td>750</td>
</tr>
<tr>
<td>ta2</td>
<td>[667] 690</td>
<td>[220] 230</td>
<td>400-420</td>
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<td>570</td>
<td>[95] 110-120</td>
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</tr>
<tr>
<td>ta5</td>
<td>240</td>
<td>[576-67] 85-100</td>
<td>100-120</td>
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<td>0.58-0.63 [0.71]</td>
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<tr>
<td>SV</td>
<td>1.22 [1.15]</td>
<td>[3.35] 3.50-3.63</td>
<td>2.68-2.83</td>
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</tbody>
</table>
Figs. 8-13. *Acinoretacus penicillatus*, adult male and female. – 8, Hypopygium; 9, superior volsella; 10, inferior volsella, lateral; 11, female genitalia, ventral; 12, female genitalia, lateral; 13, wing apex. – Fig. 14. *A. multispinosus*, wing apex.
Pupa (n=4-6). – Colour. Exuviae light brown, with clear band at posterior margin of T (II) III-V, T VI-VIII and anal lobes paler brown.

Length. Total 4.55-5.52, 5.10 mm; cephalothorax 1.25-1.38, 1.33 mm; abdomen 3.30-4.15, 3.78 mm.

Cephalothorax. Frontal setae 30-35, 32 long. Dorsal anteroponotal seta 80-100 long, thin (n=2); ventral anteroponotal seta at least 113 long, taeniate (n=1). Anterior precorneal seta around 195-238 long, taeniate; posterior seta about 15 (broken?). Dorso-central setae lengths (n=1): Dc1 48; Dc2 83; Dc3 45; Dc4 33. Dorsum with row of 7-11, 9 tubercles.

Abdomen (fig. 18). T II with posterior row of 22-27, 25 hooklets. S II (fig. 19) with postmedian row of 33-54, 46 spines; S III with postmedian row of 3-15, 10 spines. Shagreen on T II-VI with spinules larger anteromedially, followed posteriorly by smaller spinules which become progressively larger posteriorly, with posterior groups of larger spinules separated medially by area of much smaller spinules; shagreen area on T II consists of a small rectangular area and two anterolateral patches, these patches sometimes joined with median patch to form broad T-shaped area; on T III-V shagreen broadly quadrilateral or X-shaped, with small fenestrations; on T VI broadly triangular; on T VII with two anterolateral patches or patches joined to form band; T VIII with two small anterolateral patches of fine spinules or sometimes with two longitudinal bands of fine spinules. T VIII with 1-3 large and several smaller caudalateral spurs (figs. 20-22). Anal lobes with 96-128, 113 taeniae.

Larva (n=4-5). – Colour. Head capsule light yellow-brown.

Head. Postmentum length 185-202, 191. Frontal apotome and labral sclerite 1 not fused but anterior margin of apotome not distinct, apotome weakly pebbled (fig. 23). Length of antennal segments 1-5: 68-85, 76; 22-30, 28; 11-15, 14; 7-8, 8; 5-7, 6; AR 1.08-1.40, 1.26. Premandible 80-93, 86 long. Pecten epipharyngis with 13 teeth (n=2). Mandible length 158-172, 167; pecten mandibularis with 11-14, 13 setae. Mentum (fig. 24) width 115-125, 121. Ventromental plates 158-175, 166 wide; 43-47, 45 long; VPR 3.51-3.84, 3.73; with 41-52, 48 striae.

Remarks

Freeman (1957: 373) stated the superior volsella of *multispinosus* was bifid. However, in many specimens the apex is not bifid, but pad-like with a dense brush of setae (figs. 4, 5; see also Amakye & Sæther 1993: figs. 2F, 2J, 2K). In the holotype specimen and three of the five males associated with immature stages from Nigeria, one a pharate male still within its pupal skin, the apex of the volsella is bifid (figs. 2, 3, 6). In another pharate male pupa, the superior volsellae were broadly setose, similar to fig. 4. No other differences were noted among the adults, and no differences were noted in the immature stages between those adults with apically bifid or pad-like superior volsellae.

In *Acinoretracus multispinosus* and *A. regalis* a small, median protuberance, which bears several large setae, is present above the base of each inferior volsella. Amakye & Sæther (1993) termed the protuberance a median volsella; this structure is absent in *A. crispi* and *A. penicillatus*.

Amakye & Sæther (1993: 269, 272) refer to a ‘more or less distinct crista dorsalis’ on the gonostylus of *multispinosus*. However, this ridge-like structure is actually ventral and could be termed a crista ventralis. This structure is also present on *A. regalis* and *A. penicillatus*.

See Remarks under *A. regalis* for comments concerning the separation of *A. multispinosus* and *A. regalis*.

Pupae of this species and *A. penicillatus* may prove difficult to separate. In general, the pupa of *A. penicillatus* is larger (5.53-5.91 mm vs. 4.55-5.53 mm in *A. multispinosus*) and has a higher T II hooklet count (26-30 vs. 22-27 in *A. multispinosus*) but fewer anal lobe taeniae (84-100 vs. 96-128 in *A. multispinosus*). These numbers may prove meaningless when more populations are sampled; our sample is admittedly small. The shagreen spinules on T II-VI are larger anteriorly and posteriorly triangular clear areas on T VII-VIII are larger anteromedially in *A. multispinosus*; in *A. penicillatus* they are subequal anteromedially. Another useful character for separation is the presence of larger anterior and posterior triangular clear areas on T VII-VIII on *A. penicillatus*; such areas are reduced or not present on our *A. multispinosus* material.

Larvae of *A. multispinosus* are very similar to *A. penicillatus*. In our material, fourth instar *A. multispinosus* larvae were smaller; however size differences may not hold throughout the species’ range and in general may not provide a good character for separa-
tion. A good distinguishing feature is the well defined labral sclerite 1 of *A. multispinosus*; in *A. penicillatus* this sclerite is fused with the frontal apotome.

The immature stages of *A. multispinosus* described in this paper were collected from Lake Opi, a shallow (maximum depth 4 m), slightly acidic (pH 6.0-6.5) and dilute (low in dissolved minerals) body of water in the West African Guinea Savanna region nearNsuka, Nigeria. Larvae of *A. multispinosus* were uncommon at depths greater than 0.5 m in this lake (Hare & Carter 1986). For more detailed information on the chemistry of Lake Opi see Hare & Carter (1984).

The species is known from Burkina Faso, Cameroon, Chad, Ghana, Nigeria, Uganda and Zaire.


**Acinoretracus penicillatus** (Freeman) comb. n. (figs. 8-13, 15, 16, 26-33)

nec *Carteria regalis* Goetgeheuer. Freeman 1955: 371. [misidentification].

**Chironomus** (*Dicrotendipes*) *penicillatus* Freeman 1957: 374 (original description of adult male).

**Dicrotendipes penicillatus** (Freeman). Freeman & Cranston 1980: 190 (catalog).

**Description**

Adult male (n=3). – Colour. Head and antennae light brown; thorax brown, with dark median stripe extending from front of scutum to postnotum; legs brown; wings unmarked, pale brownish; abdomen brown, tergites I-VI with central dark stripe, VII, VIII and hypopygium uniform brown.

Length. Total 4.15-4.90 mm; thorax 1.05-1.15 mm; abdomen 3.10-4.90 mm.

Head. Frontal tubercles 2.0 long. Temporal setae 11-17; clypeal setae 18-22; cibarial sensilla 11-18.

Wing. Wing length 2.18-2.35 mm; width 0.63-0.70 mm. VR 1.14-1.16. Setae: R 31; R1 20-23; R4+5 35-41; squama 9-10.

Legs. Tarsomere 1 of middle leg with 21-23 sensilla chaetica; tarsomere 1 of hind leg with 0 sensilla chaetica. Lengths and proportions of legs see Table 4.


Pupa (n=3-4). – Colour. Exuviae brown, with clear band at posterior margin of T II-VI, T VII-VIII with clear anterior and posterior triangular areas; anal lobes paler brown.

**Table 3. A. penicillatus** male: lengths and proportions of legs (n = 2-3):  

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>fe</td>
<td>990-1040</td>
<td>920-950</td>
<td>1020-1040</td>
</tr>
<tr>
<td>ti</td>
<td>745-760</td>
<td>860-880</td>
<td>1140-1160</td>
</tr>
<tr>
<td>ta1</td>
<td>1130-1150</td>
<td>400-420</td>
<td>690-700</td>
</tr>
<tr>
<td>ta2</td>
<td>530-540</td>
<td>220-240</td>
<td>410-420</td>
</tr>
<tr>
<td>ta3</td>
<td>475-480</td>
<td>190-195</td>
<td>330-340</td>
</tr>
<tr>
<td>ta4</td>
<td>380</td>
<td>120</td>
<td>190</td>
</tr>
<tr>
<td>ta5</td>
<td>180-185</td>
<td>95-100</td>
<td>115-120</td>
</tr>
<tr>
<td>LR</td>
<td>1.49-1.54</td>
<td>0.47-0.48</td>
<td>0.60-0.61</td>
</tr>
<tr>
<td>BV</td>
<td>1.83-1.86</td>
<td>3.38-3.60</td>
<td>2.71-2.73</td>
</tr>
<tr>
<td>SV</td>
<td>1.55</td>
<td>4.36-4.45</td>
<td>3.13-3.14</td>
</tr>
</tbody>
</table>

**Table 4. A. penicillatus** female: lengths and proportions of legs (n = 2-3):  

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>fe</td>
<td>1000</td>
<td>960</td>
<td>1000-1090</td>
</tr>
<tr>
<td>ti</td>
<td>760</td>
<td>910</td>
<td>1120-1220</td>
</tr>
<tr>
<td>ta1</td>
<td>1250</td>
<td>460</td>
<td>680-710</td>
</tr>
<tr>
<td>ta2</td>
<td>540</td>
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<td>345-400</td>
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<tr>
<td>ta3</td>
<td>460</td>
<td>190</td>
<td>320-330</td>
</tr>
<tr>
<td>ta4</td>
<td>360</td>
<td>120</td>
<td>180</td>
</tr>
<tr>
<td>ta5</td>
<td>180</td>
<td>100</td>
<td>120</td>
</tr>
<tr>
<td>LR</td>
<td>1.64</td>
<td>0.51</td>
<td>0.58-0.61</td>
</tr>
<tr>
<td>BV</td>
<td>1.95</td>
<td>3.64</td>
<td>2.90-2.95</td>
</tr>
<tr>
<td>SV</td>
<td>1.41</td>
<td>4.07</td>
<td>3.12-3.25</td>
</tr>
</tbody>
</table>
Figs. 23-25. *Acinoretracus multispinosus* larva. – 23, Apotome and labral sclerites; 24, mentum and ventromental plate; 25, detail of ventromental plate striae. – Figs. 26-33. *A. penicillatus*, larva. – 26, Apotome and labral sclerites; 27, mentum and ventromental plate; 28, labral structures; 29, maxilla; 30, antenna; 31, premandible; 32, mandible; 33, seta subdentalis.
Length. Total 5.53-5.95 mm; cephalothorax 1.30-1.38 mm; abdomen 4.20-4.65 mm.

Cephalothorax. Frontal setae 30-50, 38 long. Dorsal anteprosternal seta not measurable (broken off?); ventral anteprosternal seta at least 150 long, taeniata (n = 1). Anterior precorneal seta not measurable, taeniata; posterior seta about 80. Dorsocentral setae lengths (n=2-3): Dc1 40-50; Dc2 100; Dc3 21-33; Dc4 40-43. Dorsum with row of 11-17, 13 tubercles.

Abdomen. T II with posterior row of 26-30, 28 hooklets. S II with posteromedian row of 10-15, 13 spines. Shagreen on T II-VI becomes progressively larger posteriorly, with posterior groups of larger spines separated mediadly by area of smaller spines; on T II consists of broad T- or V-shaped area; on T III - T V shagreen broadly quadrilateral or X-shaped, with small fenestrations; on T VI broadly triangular; on T VII with two anterolateral patches or patches joined to form band; T VIII with two anterior patches of fine spines. T VIII with 3-4 large and several smaller caudolateral spurs (fig. 16). Anal lobes with 84-100, 92 taeniae.


Remarks

See remarks under A. multispinosus for separation of the immature stages.

Our associated material was collected at the type-locality from bottom mud in acid, brown water dystrophic lakes and ponds at a depth of about 1.5 m; they were not collected in the marginal reeds. The small lake at Betty’s Bay is described by Harrison (1958).

The species is known only from South Africa.


Acinoretracus regalis (Goetghebuer) comb. n.

Chironomus (Carteria) regalis Goetghebuer 1936: 465 (original description of adult male).

Chironomus (Dicrotendipes) regalis Goetghebuer. Freeman 1957: 373 (redescription).

Dicrotendipes regalis (Goetghebuer). Freeman & Cranston 1980: 190 (catalog).

This species is very similar to A. multispinosus, differing mainly in having a normal spur count on the hind tibial combs. Freeman (1957) stated that the two species could be separated by differences in the genitalia, such as the anal point being narrower in side view in multispinosus (this difference has been difficult to observe), more rounded gonostylus in multispinosus (Freeman himself stated that this difference may not be constant), and the bifid nature of the superior volsella in multispinosus (which, as discussed above, is not always bifid). The two species are so similar in structure that it may be that both are the same; A. multispinosus may only be a variety with extra spurs on the hind tibial comb. We have made regalis the type-species for the genus because it was the first described species; should multispinosus fall as a synonym, no name changes or change in type-species status would be necessary. Reared material and more adult material will be needed to solve the potential problem of separation of regalis from multispinosus. The immature stages of A. regalis are unknown.

The species is recorded from Burkina Faso, Ghana, Sierra Leone and Zaire.


Acinoretracus crispi (Freeman) comb. n.

Chironomus (Dicrotendipes) crispi Freeman 1957: 374 (original description of adult male).

Dicrotendipes crispi (Freeman). Freeman & Cranston 1980: 190 (catalog).

This species differs from the other three in the genus by having a more slender and strongly curved gonostylus, long and slender superior volsella, and a narrow anal point that is sharply hooked apically (Freeman 1957: figs. 8g, 8j). The inferior volsella is similar to that of A. penicillatus in that it lacks the preapical dorsal swelling. The immature stages are unknown.

The species is recorded from Chad, Ghana, Mali, Nigeria and Sudan.

Material examined. – [GHANA]: Gold Coast: Red Volta, Nangodi, 8-x-1954, G. Crisp, 1 ♂ paratype (BMNH).
Key to adult males of *Acinoretacus*

1. Gonostylus broad, bulbous, semi-quadrate; superior volsella short; anal point broad (figs. 1, 8) ...2
   - Gonostylus more slender, strongly curved; superior volsella long and slender; anal point slender (see Freeman 1957: figs 8f, 8j) ............... *A. crispi*  
2. Hind tibia with 1 spur on outer tibial comb ...3
   - Hind tibia with 4-5 spurs on outer tibial comb... .................................................. *A. multispinosus*  
3. Median volsella present with 4-7 large setae; inferior volsella with dorsal subapical swelling (similar to figs. 1, 7; see also Freeman 1957: figs. 8d, 8h) ...................................................... *A. regalis*  
   - Median volsella absent; inferior volsella without subapical swelling or at most a slight dorsal expansion (figs. 8, 10) .................... *A. penicillatus*  

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**References**


Harrison, A. D., 1958. Hydrobiological studies on alkaline and acid still waters in the western Cape Province. – Transactions of the Royal Society of South Africa 36: 213-244.


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