

Revision of Afrotropical Pentastirini
(Homoptera, Cixiidae) II: the genus
Pentastiridius Kirschbaum, 1868^o

by Jan VAN STALLE^{oo}

Summary

The genus *Pentastiridius* Kirschbaum is represented in the Afrotropical realm by 16 species. Five species and one subspecies are newly described, a new combination is proposed for ten others and five names are relegated to synonymy. A lectotype is selected for the species described as *Oliarus suzeensis* Matsumura, *O. limbifer* Hesse, *O. latus* Melichar and *Cixius funebris* Walker. A key is given to all taxa which are described and illustrated with emphasis on the male genitalia.

The tribe Pentastirini accommodates about 2/3 of the Afrotropical Cixiidae. In 1980 about 100 taxa were described in one single genus, namely *Oliarus*. We are now able to recognise about 200 taxa which will be described in different genera in the subsequent numbers of these series.

The genus *Pentastiridius* KIRSCHBAUM was redescribed by EMELJANOV (1971) and presently counts about 20 Palearctic species; no taxa have hitherto been recorded from other zoogeographical realms. In this paper 16 Afrotropical species are added to this genus, occurring all over the African mainland. Only one species, *Pentastiridius suzeensis* (MATSUMURA), is found in both the Afrotropical and Palearctic realm.

The species of this genus are very uniform in external morphology as well as in the male and female terminalia. They are difficult to separate with the actual literature, especially due to the lack of uniform illustrations, which are necessary to show the minor differences between closely related forms. This situation has led to several misidentifications and confusions, and a synonymical list is given at the head of each species description.

A genus description based on the Afrotropical species is given below. The width of the vertex is measured along the apex of the basal emargination; its length is taken along the

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median line. The topic "chaetotaxy" in the species descriptions always pertains to the apical row of teeth present on the first and second segment of the hindtarsi. The formula used in these series contains two parts respectively for the first and second tarsite; the absence or presence of parentheses is concerned with their morphology: absent if only a single row of black teeth is present (viz. the genus *Pseudoliarus* HAUPT) or present in the case of a double row consisting of a basal part of minute black teeth opposed by an equal number of large membraneous teeth in the distal row (= scale like teeth, FENNAH 1958b). Accordingly, (15)/(10) indicates a double row of 15 teeth on the first tarsite and a double row of 10 on the second. (13-18)/(11-14) indicates a double row of 13 to 18 teeth on the first tarsite and 11 to 14 on the second.

For convenience the complete list of examined material is omitted in the commonest species. The museums and institutions are listed with their abbreviations: British Museum (Natural History), BMNH; Koninklijk Museum voor Midden-Afrika, Tervuren, Belgium, KMMA; Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussel, Belgium, KBIN; private collection of Dr. R. Linnavuori, Raisio, Finland, CL; Museum National d'Histoire naturelle, Paris, France, MNHN; Zoological Museum, University of Helsinki, Finland, ZMH; Naturhistoriska Riksmuseet, Stockholm, Sweden, NR; Suid-Afrikaanse Museum, Kaapstad, South-Africa, SAM; Staatliches Museum für Naturkunde, Stuttgart BRD, SMN; National Museums of Kenya, Nairobi, NMK; National Museums and Monuments, Bulawayo, Zimbabwe, NMB; Moravské Museum, Brno, Czechoslovakia, MM; Hokkaido University, Sapporo, Japan, HU.

genus *Pentastiridius* KIRSCHBAUM

Type species: *Flata pallens* GERMAR, 1821

Small species (4.5 - 7 mm), dark brown to black with yellowish carinae and borders. Vertex shallowly excavated basally, width at apex of emargination one or two times (exceptionally more) its length, lateral keels slightly prominent, but not lamelliform. Median longitudinal keel absent, rudimentary, or well-developed in basal half, sometimes even reaching to subapical keel, the latter connected to apical border by two submedian longitudinal carinae, which can be distinct or very obsolete. Face devoid of maculae or fenestrae; median keel well-developed, except in *Pentastiridius eurycephalus* where obsolete. Rostrum exceeding hind-coxae. Eyes variable in proportions, broader than vertex to smaller than half its width at level of basal emargination. Postclypeus not swollen; third ocellus distinct, situated (in lateral view) at level of lateral ones. Mesonotum with five distinct longitudinal keels. Tegmina hyaline to dark brown, provided with a triangular stigma and thirteen apical veins; these smooth by the fact that the granules are small and concolorous; costal margin not granulated. Legs relatively short, hind-tibiae with three lateral spines in basal half; hindtarsi broad, provided with a double row of teeth, the first segment usually bearing more teeth than the second, varying between 9 and

20. The number is variable within the species and even within a specimen from left to right.

There is a slight sexual dimorphism: females are larger, have a broader vertex and are paler in colour. The greatest sexual dimorphism occurs in *Pentastiridius sudanicus* (LALLEMAND). *Pentastiridius eurycephalus* has aberrant external characters which are discussed upon in the species description. In this respect it resembles *Pentastiridius sinaiticus* HORVATH, 1913 which is discussed in VAN STALLE (1985b).

Male genitalia: very uniform throughout the genus: anal segment and pygofer symmetrical, without distinct processes. Genital styles slightly asymmetrical, bearing a ridge apically on their inner surface. Aedeagus (fig. 11) provided with one dextral process emerging from base of periandrium, two spines inserted apically near flagellum ("apical spines") and running parallel to it and finally, one small spine near the two former and only visible in ventral view ("ventral spine"). Flagellum with or without an apical spine.

Female genitalia (fig. 7-9, 37-39): very uniform throughout the genus; pregenital sternite small, ovipositor with three pairs of valvulae, as long as sclerotized part of anal segment. First pair without a basal thickness, tapering distally, second pair hair-shaped, thin; third pair broad, strongly sclerotized. Anal segment in dorsal view less broad than half width of pygofer, rectangular.

Diagnosis.- The genus can easily be recognized by the characteristic shape of the aedeagus, bearing a spon-like dextral process and two large and one small spinose process situated apically near the flagellum (all except *Pentastiridius verheyeni*). With regard to the external features the genus *Pentastiridius* can be distinguished by the combination of the following characters: (1) no roundish spots near the frontoclypeal suture; (2) vertex as broad as long or broader; (3) tegmina hyaline to dark brown, devoid of a colour pattern (except *Pentastiridius verheyeni*), costal margin not granulated, stigma triangular; (4) hindtarsi bearing a double row of black and membraneous teeth, usually more than nine (except *Pentastiridius eurycephalus*: seven).

Species recognition is based primarily on the structure of the aedeagus. Both apical spines are very constant in shape; the form of the apical portion of the dextral process on the contrary is variable within limits. With some reserve the proportions of the vertex and the colour of the tegmina can be used to distinguish species and species-groups.

Key to the Afrotropical species, primarily based on the structure of the aedeagus. *Pentastiridius latus* (MELICHAR), only known from the female lectotype, is excluded.

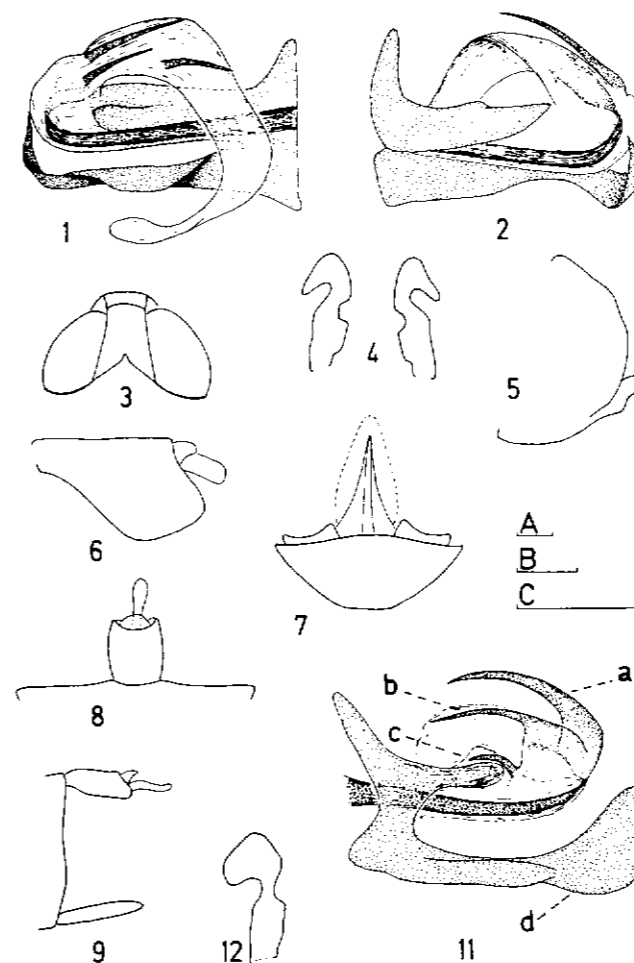
1. - Apical portion of tegmina behind level of stigma conspicuously coloured with brown *P. verheyeni* (SYNAVE)
- Tegmina uniformly hyaline or brown, without such a spot 2
2. - Vertex as broad as long at tip of basal emargination 3
- Vertex broader than long 5

3. - Flagellum provided with an apical spine 4
 - Flagellum without spine *P. sudanicus* (LALLEMAND)
 4. - Dextral process of aedeagus tapering distally *P. suezensis* (MATSUMURA)
 - Dextral process of aedeagus blunt *P. limbifer* (HESSE)
 5. - Flagellum provided with an apical spine 12
 - Flagellum without an apical spine 6
 6. - Dextral process of aedeagus tapering distally or toothed 7
 - Dextral process of aedeagus blunt and without teeth 8
 7. - Tegmina uniformly dark brown, total length 6 to 7 mm
 *P. nigripennis* (SYNAVE)
 - Tegmina hyaline, not coloured, total length 4.5 - 5.5 mm
 *P. nigripennis* ssp. *darfuri* n. ssp.
 8. - Vertex more than twice as broad as long. Eyes small, less than half width of vertex (fig. 23) *P. iphis* (LINNAVUORI)
 - Vertex less broad than twice its length, eyes larger, broader than half width of vertex 9
 9. - Two apical spines on aedeagus very unequal in length 10
 - Two apical spines on aedeagus equal in length or nearly so 11
 10. - Aedeagus with first apical spine slightly recurved, not parallel to second (fig. 51) *P. badiensis* sp. n.
 - Aedeagus with first apical spine straight (fig. 52) *P. virgultivagus* (HESSE)
 11. - Apical spines on aedeagus identical, parallel, ventral spine relatively short (fig. 50) *P. kassalanus* sp. n.
 - Apical spines on aedeagus not identical, curved in a different way, ventral spine large (fig. 48) *P. inermis* (FENNAH)
 12. - Flagellum with a forked spine (fig. 41) *P. bifurcatus* sp. n.
 - Flagellum with a simple spine, not forked 13
 13. - Vertex twice as broad as long or more; eyes reduced, less broad than half width of vertex at tip of posterior emargination 14
 - Vertex less broad than twice its length; eyes larger, broader than half width of vertex (fig. 46) *P. moestus* (STAL)
 14. - Vertex broader than twice its length (fig. 27); ventral spine on aedeagus longer than half length of apical spines (fig. 26); chaetotaxy (7)/(7) *P. eurycephalus* sp. n.
 - Vertex twice as broad as long; ventral spine shorter, half length of apical spines (fig. 25); chaetotaxy (13-15)/(10) *P. felimontis* sp. n.

Pentastiridius verheyeni (SYNAVE) comb. n.
 (Fig. 1 - 9)

Olianus (sic) *verheyeni* SYNAVE, 1953b: 26, fig. 19 - 21

Oliarus verheyeni SYNAVE; SYNAVE, 1960: 24; LINNAVUORI, 1973: 90, fig. 29 c-f; VAN STALLE, 1984: 113.



Figs 1 to 9: *Pentastiridius verheyeni* (Synave)

1: aedeagus, dorsal view; 2: aedeagus, ventral view; 3: head; 4: genital styles; 5: pygofer, lateral view; 6: anal segment, lateral view; 7: female genitalia, ventral view; 8: idem, dorsal view; 9: idem, lateral view.

Figs 11 and 12: *Pentastiridius sudanicus* (Lallemand)

11: aedeagus, ventral view, specimen from Chad, Farcha; a: first apical spine; b: second apical spine; c: ventral spine; d: dextral process; 12: left genital style, specimen from Farcha; 12: left genital style. Scale A (0.2 mm): 3, 7, 8, 9; B (0.2 mm): 4, 5, 6, 12; C (0.2 mm): 1, 2, 11.

Material examined. - Holotype ♂, Zaïre, Parc nat. Upemba, Kankunda, affl. g. Lupiala 1300 m, 22/28-XI-1947, KMMA.

Paratypes: 190 spec., same locality, KMMA, KBIN.

Additional material: 2 ♂ 2 ♀, Tanzania, Musosa, IX-1939 (H.J. BREDO), KBIN; 1 ♂ 1 ♀, Zaïre, Parc nat. Garamba, IX-1950, KBIN, KMMA; 78 spec., Ivory Coast, Lamto, 8/9-X-1973, CL; 27 ♂ 21 ♀, Sudan, Equatoria, Loka forest, 8/10-IV-1963, CL, 5 ♂ 5 ♀ ZMH; 11 ♂ 4 ♀, Equatoria, Ibbu-Yambio, 16-IV-1963, CL, 6 ♂ 1 ♀ ZMH; 1 ♂, Bahr el Ghazal, Wau, 19-II-1963, ZMH.

Description. - *Pentastiridius verheyeni* can be distinguished from all other african species by the colour of the apical portion of the tegmina which is conspicuously coloured with brown in contrast to the hyaline basal part. Chaetotaxy: (14-15)/(16-17).

♂ genitalia: aedeagus with a long flagellum which surpasses the right margin (in dorsal view) and bears three subequal spines in the proximal part. Dextral process tapering distally. Figures of genitalia made after a specimen from the 'Parc national de l'Upemba'.

♀ genitalia: as illustrated in fig. 7 to 9.

Distribution. - Among the african Pentastirini *P. verheyeni* is one of the exceptions which have been recorded both north and south of the tropical rain forest belt, in the transition zone between forest and savanna. The species has been recorded from Zaïre, Tanzania, the Sudan and the Ivory Coast.

Pentastiridius sudanicus (LALLEMAND) comb. n.
(Fig. 10 to 19)

Oliarus sudanicus LALLEMAND, 1925: 4.

Oliarus sudanicus LALLEMAND; LINDBERG, 1958: 131, fig. 59 a-c; LINNAVUORI, 1973: 90; DLABOLA, 1979: 116.

[*Oliarus limbifer* HESSE]; SYNAVE, 1953a: 26, fig. 4 e-h; FENNAH, 1957: 37, fig. 21 a-c; SYNAVE, 1960: 26; SYNAVE, 1979: 150; VAN STALLE, 1984: 110.

[*Oliarus limbifera* (sic) HESSE]; SYNAVE, 1969: 182.

Oliarus praeneste FENNAH, 1958a: 469, fig. 4, 5-8, syn. n.

[*Oliarus laelaps* FENNAH]; SYNAVE, 1960: 24 (in partim).

Material examined. - Holotype ♀, Sudan, "Sudan Nilen", "Pr. W. Exp. Gyld.", NR.

1 ♂ (holotype of *O. praeneste* FENNAH), Senegal, Dakar, 10-II-1953 (VILLIERS), MNHN.

Additional material: 316 specimens collected in 55 localities in the Cape Verde Islands, Gambia, Ghana, Mali, Nigeria, Cameroon, Chad, the Sudan, Egypt, Uganda, Kenya, Tanzania, Congo Brazzaville, Zaïre, Malawi, Mozambique, Zimbabwe, Namibia, South-Africa and Botswana.

Description. - Vertex as long as broad in males (fig. 18), somewhat broader in females; tegmina hyaline; chaetotaxy (13-18)/(11-14). Highest developed sexual dimorphism among the african species; females appreciably larger, paler, and anterior compartment of vertex pale ochreous in contrast to the dark basal portion.

Length: ♂: 5.5 - 6.5 mm; ♀: 7.5 - 9 mm

♂ genitalia: apical spines curved parallel to flagellum; apical part of dextral process variable in shape, blunt; flagellum without spine.

Diagnosis. - Externally close to *Pentastiridius suezensis* and *P. limbifer*. Differs from these species in the absence of a spine on the flagellum.

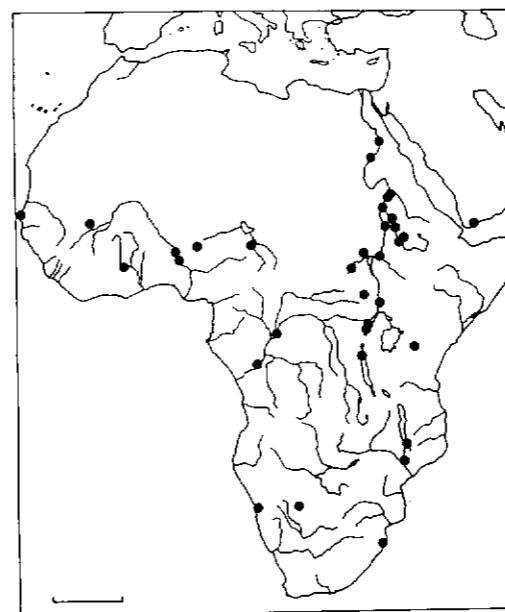


Fig. 10. Distribution of *Pentastiridius sudanicus* (Lallemand). Scale: 1000 km.

Distribution. - The commonest Afrotropical species occurring both north and south of the rain forest (fig. 10), between 400 and 1400 mm of annual rainfall, except along the valley of the river Nile, where it has been recorded as far as Asswan. Furthermore, its range extends southward along the borders of the east-african mountains into southern Africa where its distribution is not very clear: it has been recorded along the borders of the Kalahari and Namib desert, but seems to be absent in the southern african Veld-district.

Pentastiridius suezensis (MATSUMURA) comb. n.

(Fig. 20)

Oliarus suezensis MATSUMURA, 1910: 7*Oliarus suezensis* MATSUMURA; WAGNER, 1954: 211[*Oliarus limbifer*] HESSE; SYNAVE, 1979: 150*Material examined.* - Lectotype ♂, by present designation, Egypte, Port Saïd, HU.

Paralectotypes: 8 ♂ 1 ♀, same locality, HU.

Additional material: 3 ♂, Senegal, Mboro, VIII-1971 (A. VILLIERS), MNHN; 2 ♂, Somone, VIII-1971 (A. VILLIERS), MNHN; 1 ♂ 1 ♀, Niger, Matameyé, 15-V-1973, KBIN; 3 ♂ 10 ♀, Chad, N'Gouri, Distr. de Kanem, VIII-1958 (P. RENAUD), KMMA; 4 ♂ 1 ♀, Egypte, Umgeb. Suez, 16-VI-1961, ZMH.

Description. - Differs from the preceding species in the tapering dextral process and in the presence of a spine on the flagellum. Figure 20 is made after a specimen from Somone (Senegal).*Distribution.* - A mainly Palearctic species which occurs in Africa along the southern border of the Sahara. It has been recorded from Senegal to the Sudan and along the valley of the river Nile.*Remark.* - I have examined three males from the type series; one specimen was selected as lectotype.DLABOLA (1964) and LINNAVUORI (1964) considered this taxon as a synonym of *Pentastiridius pallens* (GERMAR). Since, to my knowledge, the types of both taxa were never compared we cannot accept the synonymy.*Pentastiridius limbifer* (HESSE) comb. n.

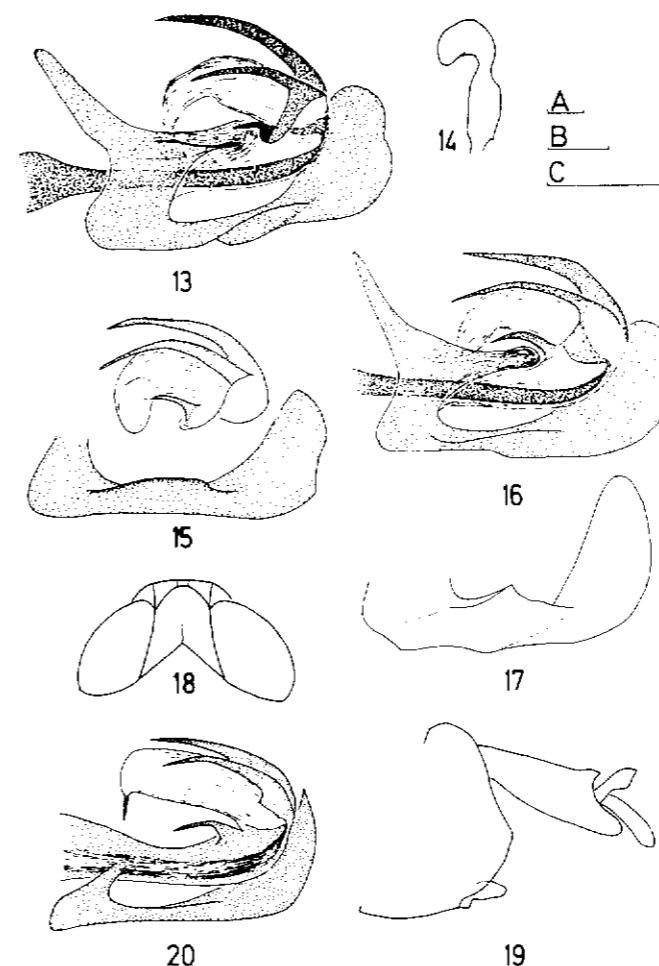
(Fig. 21)

Oliarus limbifer HESSE, 1925: 151, pl. VII, fig. 4*Oliarus limbifer* HESSE; SYNAVE, 1953a: 25.nec *Oliarus limbifer* HESSE; SYNAVE, 1953b: 26, fig. 4 e-h; FENNAH, 1957: 37, fig. 21 a-c;

SYNAVE, 1960: 26; 1979: 150; VAN STALLE, 1984: 110.

nec *Oliarus limbifera* (sic) HESSE; SYNAVE, 1969: 182.*Material examined.* - Lectotype ♂, by present designation, Namibia, Mafa, Ongandjera, II-1923, SAM.

Paralectotype: 1 ♀, same locality, SAM.

Figs 13 to 19: *Pentastiridius sudanicus* (Lallemand)13: aedeagus, specimen from the Sudan, Wadi Halfa; 14: left genital style, specimen Wadi Halfa; 15: aedeagus (mutilated), holotype *Oliarus praeneste*; 16: aedeagus, specimen from Nigeria, Shagunu; 17: dextral process of aedeagus, other specimen from Shagunu; 18: head, dorsal view; 19: pygofer and anal segment, lateral view.Fig. 20: *Pentastiridius suezensis* (Matsumura), aedeagus.

Scale A: 18; B: 12, 14, 19; C: others - 0.2 mm.

Additional material: 1 ♂, Zaïre, Parc nat. Upemba, Lusinga (1760 m), 4-XII-1948, KMMA; 5 ♂ 1 ♀, parc nat. Upemba, Mabwe (585 m), 12/19-I-1949, KMMA; 1 ♂, Zambia, Katambora, II-1964, NMB; 1 ♂ 3 ♀, Angola, Roçadas, 30-II-1973, BMNH.

Description. - External characters like those of *P. sudanicus*, but sexual dimorphism less developed. Chaetotaxy (15-17)/(12-14).

Length: 6 - 6.5 mm.

♂ genitalia: apical spines on aedeagus unequal in length, first recurved, second parallel to flagellum; dextral process blunt apically; flagellum with terminal spine (fig. 21).

Diagnosis. - Closely related to *P. sudanicus* and *P. suezensis*. It can be recognized by the combination of the following features: dextral process blunt, apical spines unequal and terminal spine on flagellum.

Distribution. - This species occurs besouth of the tropical rain forest belt. It has been recorded from southern Zaïre, Zambia and Angola.

Remarks. - The records published by SYNAVE, FENNAH and myself pertain to *P. sudanicus*. It is not a synonym of *P. sudanicus* as stated by LINNAVUORI (1973).

Pentastiridius iphis (LINNAVUORI) comb. n.
(Fig. 22 to 24)

Oliarus moestus ssp. *iphis* LINNAVUORI, 1973: 91, fig. 30 c,j.
[*Oliarus nyanzae* ssp. *inermis* FENNAH]; SYNAVE, 1968: 445; VAN STALLE, 1984: 113.

Material examined. - Holotype ♂, Sudan, Kordofan, Tendelti-Umm Ruwaba, 25-I-1963, CL.

Paratypes: 3 ♀, same locality, CL; 1 ♂, Kordofan, Selima, 24-I-1963, CL; 1 ♀, El Obeid-Dilling, 30-I-1963, CL; 1 ♀, Ed Damer, 5/10-VII-1961, CL; 3 ♀, Blue Nile, Wad Medani, 11/12-XI-1962; 4 ♂ 53 ♀ (= *P. nigripennis* ssp. *darfuri*), Darfur, Safaha-Abu Matariq, 30-IV/2-V-1963, CL, KBIN, BMNH, ZMH; 2 ♂ 30 ♀ (= *P. nigripennis* ssp. *darfuri*), Upper Nile, Malakal, 5/20-I-1963, CL, KBIN, ZMH; 2 ♂ 42 ♀, (*P. nigripennis* ssp. *darfuri*), Equatoria, Kapoeta-Boma, 26/27-III-1963, CL, KBIN, ZMH.

Additional material: 1 ♀, Sudan, Medani, 4-X-1926 (H.W. BEDFORD), at light, BMNH; 1 ♀, Gendettu (W.E. GIFFARD), 25-I-1925, from *Lubia*, BMNH; 1 ♂ 1 ♀, Ethiopia, Erithrea, Ailet, 30/31-V-1963, KBIN; 4 ♂ 4 ♀, Chad, Distr. Kanem, N'Gouri, X/XI-1958 (P. RENAUD), KMMA; 1 ♂ 1 ♀, Nigeria, Samaru, 3/10-VI-1970, BMNH; 1 ♂ 2 ♀, Niger, Niamey, XII-1938 (L. CHOPARD), MNHN; 1 ♂, Ivory Coast, Bingerville, XI-1963 (J. DECELLE), KMMA; 2 ♂ 3 ♀, Senegal, M'Bour, Piège lumineux, 5-XI-1981 (B. SIGWALT), MHNH.

Description. - Colour black; postclypeus slightly swollen. Vertex 2 to 2.5 times as broad as long with a relatively broad and obtuse subapical transverse keel. Eyes reduced. Tegmina hyaline. Chaetotaxy (13-16)/(11-13). Sexual dimorphism slightly developed.

Length: 5 - 6 mm.

♂ genitalia: apical spines on aedeagus unequal in length, first one recurved; dextral process relatively small in comparison to other species, broadly rounded to shallowly excavated in specimens from Senegal. Flagellum without terminal spine. Figures 22 to 24 made after holotype.

Diagnosis. - *P. iphis* resembles *P. eurycephalus* and *P. felimontis* with regard to the very broad vertex. It can be distinguished from these species by the presence of hyaline tegmina but above all by the shape of the male terminalia. In *P. eurycephalus* and *P. felimontis* the dextral process is tapering and the flagellum bears a terminal spine.

Distribution. - A common sudanian species recorded from Senegal, the Ivory Coast, Niger, Nigeria, Chad, the Sudan and Ethiopia.

Remarks. - *P. iphis* has mainly been recorded during the rainy season.

Pentastiridius felimontis sp. n.
(Fig. 25)

Material examined. - Holotype ♂, South-Africa, Cape prov., Katberg 4000 ft., XII-1932 (R.E. TURNER), BMNH.

Paratypes: 4 ♀, same locality, PMNH.

Description. - Colour dark brown, mesonotum black, legs yellowish brown. Vertex twice as broad as long, eyes reduced. Tegmina dark brown. Chaetotaxy (13-15)/(10).

Length: 4.5 - 5.5 mm.

♂ genitalia: ventral spine on aedeagus relatively long in comparison to the apical spines. These both curved parallel to flagellum. Dextral process tapering.

Pentastiridius eurycephalus sp. n.
(Fig. 26 to 28)

Oliarus spec. apud *moestus* (STÅL); SYNAVE, 1963: 448, fig. 1.

Material examined. - Holotype ♂, Guinée, Mt. Nimba, 'D-1946', VIII/X-1946 (M. LAMOTTE), KBIN.

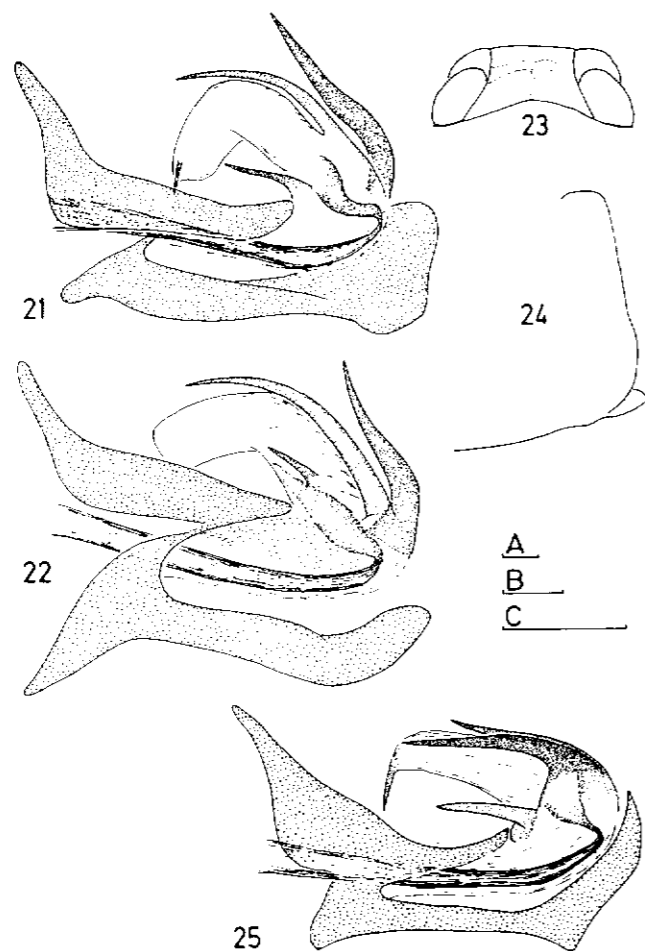


Fig. 21: *Pentastiridius limbifer* (Hesse), aedeagus.
 Figs 22 to 24: *Pentastiridius iphis* (Linnavuori)
 22: aedeagus; 23: head; 24: pygofer.
 Fig. 25: *Pentastiridius felimontis* sp. n., aedeagus.
 Scale A: 23; B: 24; C: others - 0.2 mm.

Description. - General colour fuscous. Vertex very broad (15:38), subapical keel indistinct, eyes reduced. Pronotum as long as vertex along median line. Mesonotum with only three indistinct longitudinal keels, surface reticulate. Tegmina broad and short, fuscous. No lateral spines on hind-tibiae, chaetotaxy hindtarsi (7)/(7).

Length: 5 mm.

♂ genitalia: anal segment broadening apically (fig. 28). Aedeagus (fig. 26) with a relatively long ventral spine; dextral process tapering; flagellum with a long spine.

Diagnosis. - *P. eurycephalus* differs considerably from most other *Pentastiridius* species: the vertex is very broad and the eyes reduced. The pronotum is relatively long and the mesonotum bears only three indistinct carinae while usually five are present in other members of this genus. Finally, a low number of teeth on the hindtarsi is unusual too. All these characters are also present in *P. sinaiticus*, but still in a more extreme form (VAN STALLE, 1985b). They suggest a reduction of the plesiomorphic state or a retention of larval characters. The structure of the aedeagus indicates that both species did not evolve from the same ancestral stock. Both taxa are (probably) endemic on Mt. Nimba and Mt. Sinai respectively, and their characters have evolved separately from each other.

Pentastiridius nigripennis (SYNAVE) comb. n.
 (Fig. 29-39)

Oliarus nigripennis SYNAVE, 1960: 27, fig. 42.

Oliarus moestus ssp. *choaspes* LINNAVUORI, 1973: 91, fig. 30 b,i syn. n.

Material examined. - Holotype ♂, Zaïre, Parc nat. Garamba, Morubia, 12-III-1952, KMMA.

Paratypes: 3 ♂, same locality, KBIN; 2 ♂ 1 ♀, same locality, Mabanga, 8-I-1952, KMMA; 4 ♂ 2 ♀, Parc nat. Garamba, 2-IV-1952, 20-IV-1952, 22-V-1952, KMMA.

Additional material: 1 ♂ (Ht. *choaspes*), Sudan, Blue Nile, nr. Malakal, 5/20-I-1963, CL; 4 ♂ 13 ♀, same locality, CL, KBIN, ZMH; 1 ♂ 1 ♀, Ethiopia (Abyssinia), Lake Rudolph Exp., Digiva, Akobo river, 18-V-1904 (Ph. C. Zaphiro), BMNH.

Description. - Head, pronotum and mesonotum black, legs ochreous, tegmina uniformly brown. Vertex twice as broad as long, median longitudinal keel almost completely developed. Chaetotaxy (11-16)/(9-13).

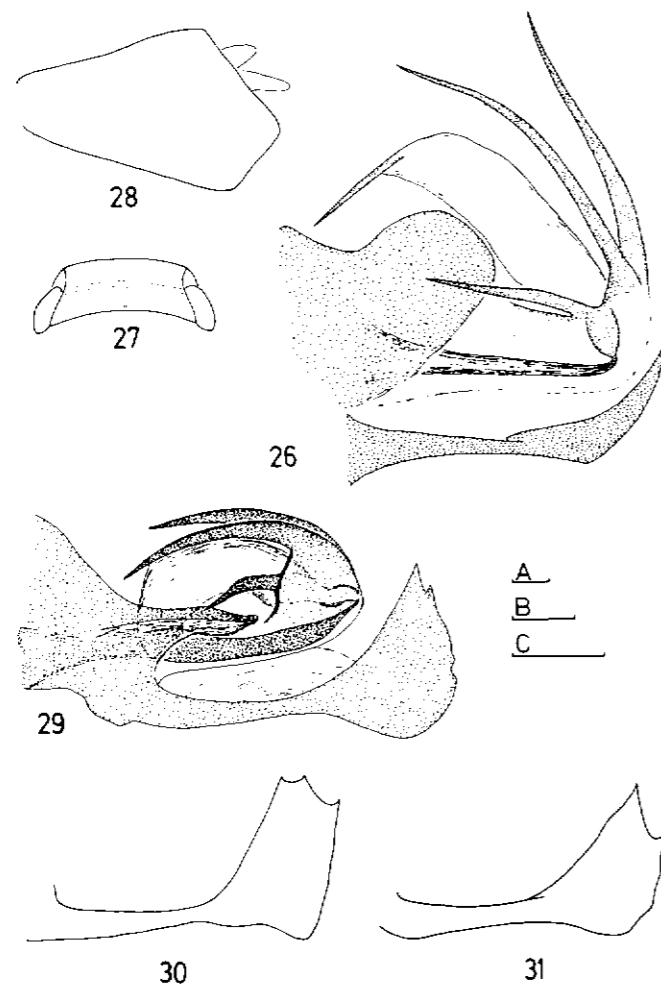
Length: 6 - 7 mm.

♂ genitalia: apical spines of aedeagus almost identical; ventral spine broad, curved; dextral process tapering, with a variable number of teeth apically.

♀ genitalia: as illustrated in fig. 37 to 39.

Diagnosis. - Easily distinguishable from all other species by the presence of brown

tegmina, the broad vertex and the tapering and toothed dextral process of the aedeagus; no closely related species have been observed.



Figs 26 to 28: *Pentastiridius eurycephalus* sp. n.

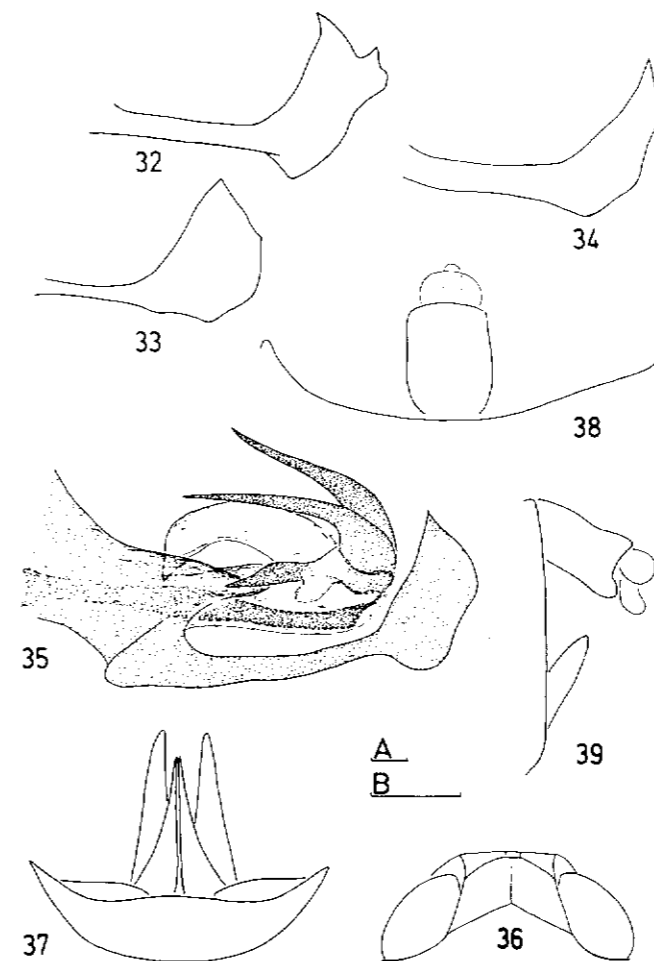
26: aedeagus; 27: head; 28: anal segment

Figs 29 to 31: *Pentastiridius nigripennis* (Synave)

29: aedeagus, paratype; 30: dextral process of aedeagus, other paratype; 31: idem, other paratype;

Scale A: 27; B: 28; C: others - 0.2 mm.

Remarks. - According to LINNAVUORI (1973) *Oliarus moestus* ssp. *choaspes* is distinguished from *nigripennis* by the different shape of the dextral process and by the presence of setae on the tegmina. *P. nigripennis* bears these setae too and the shape of the dextral process is variable; accordingly there is no reason to maintain a subspecies based on these characters.



Figs 32 to 39: *Pentastiridius nigripennis* (Synave) 32: dextral process of aedeagus, other specimen

than (31), same locality; 33: idem, other specimen, same locality; 34: idem, paratype *Oliarus*

moestus choaspes; 36: head; 37: female genitalia, ventral view; 38: idem, dorsal view; 39: idem, lateral view.

Scale A: 36 to 39; B: others - 0.2 mm.

Pentastiridius nigripennis ssp. *darfuri* ssp. n.
(Fig. 40)

[*Oliarus moestus* ssp. *iphis*] LINNAVUORI, 1973: 91 (in partim)

Material examined. - Holotype ♂, Sudan, Darfur, Safaha - Abu Matariq, 30-IV/2-V-1963, KBIN.

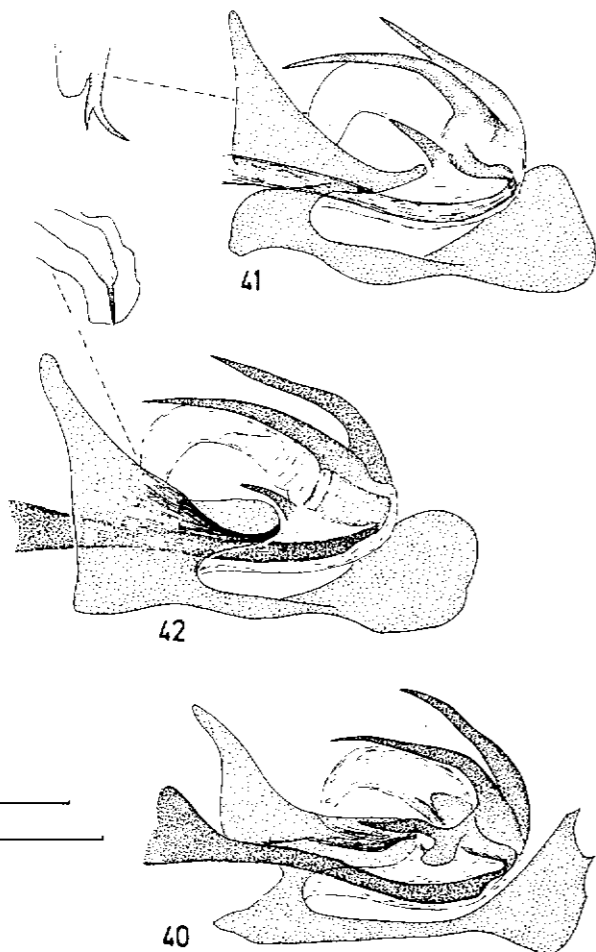


Fig. 40: *Pentastiridius nigripennis* ssp. *darfuri* ssp. n., aedeagus.

Fig. 41: *Pentastiridius bifurcatus* sp. n., aedeagus.

Figs 42: *pentastiridius moestus* (Stål)

42: aedeagus, specimen mont Hoyo, Parc national Albert. Scale A: 40; B: 41, 42 - 0.2 mm.

Paratypes: 4 ♂ 53 ♀, same locality, CL, KBIN, BMNH, ZMH; 2 ♂ 30 ♀, Sudan, Upper Nile, Malakal, 5/20-I-1963, CL, KBIN, ZMH; 2 ♂ 42 ♀, Sudan, Equatoria, Kapoeta-Boma, 26/27-III-1963, CL, KBIN, ZMH.

Description. - Like the nominate form, but smaller, and tegmina hyaline.
Length: 4.5 - 5.5 mm.

Diagnosis. - This subspecies can only be distinguished from the nominate form by the two characters mentioned above. As intermediates were not found, we tentatively propose the status of subspecies until further material becomes available.

Pentastiridius bifurcatus sp. n.
(Fig. 41)

Material examined. - Holotype ♂, South Africa, Howieson's Poort (J. HEWITT), 13-IX-1924, BMNH.

Paratype: 2 ♀, same locality, BMNH; 1 ♂, Zaïre, Parc nat. Albert, Mont Hoyo (1280 m), sur plantes basses (P. VANSCHUYTBROECK), 7/15-VII-1955, KMMA.

Description. - Colour black, vertex twice as broad as long. Tegmina hyaline, sometimes slightly fumated with brown; chaetotaxy (12-14)/(11).

Length: 4.5 - 5.5 mm.

♂ genitalia: apical spines on aedeagus unequal in length; dextral process blunt; flagellum with a forked terminal spine.

Diagnosis. - Distinguishable from all other species by the presence of a forked spine on the flagellum.

Pentastiridius moestus (STÅL) comb. n.
(Fig. 42 to 47)

Cixius moestus STÅL, 1855: 92;

Cixius moestus STÅL; WALKER, 1858: 322; DOHRN, 1859: 61.

Oliarus moestus (STÅL); STÅL, 1862: 306; 1866: 169; SYNAVE, 1953a: 24, fig. 4 a-d;

FENNAH, 1958: 462 (?); DLABOLA, 1979: 116 (?).

nec *Oliarus moestus* (STÅL); FENNAH, 1957: 34, fig. 19 a-e; LINNAVUORI 1973: 91, fig. 30

a, d, e, g, f; VAN STALLE, 1982: 4.

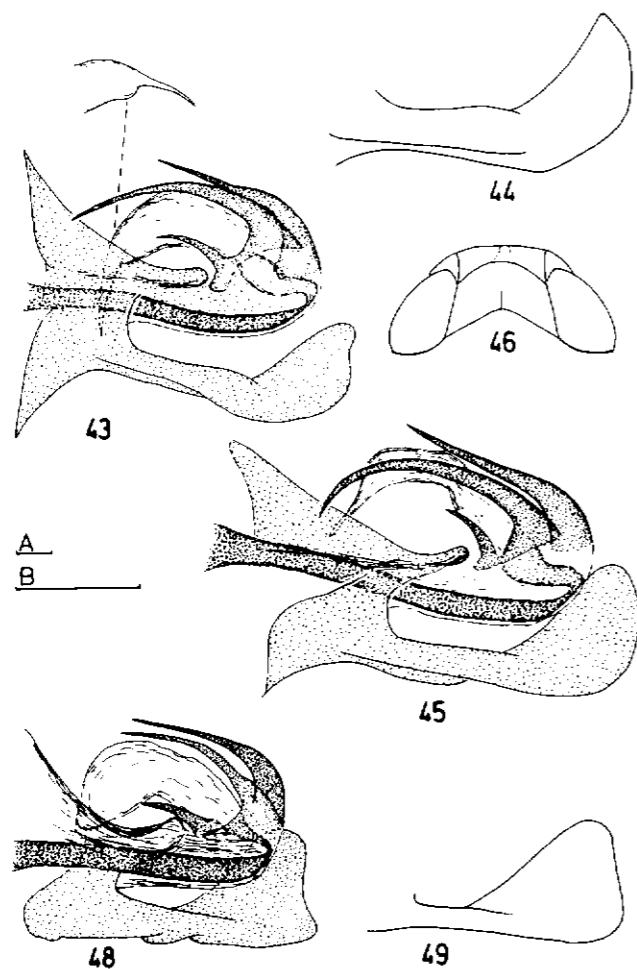
Cixius funebris WALKER, 1858: 41 syn. n.

Oliarus funebris (WALKER); DISTANT, 1907: 281.

Oliarus nyanzae FENNAH, 1955: 430, fig. 3 a-b syn. n.

Oliarus nyanzae ssp. *gracilior* FENNAH, 1957: 36, fig. 20 a-b syn. n.

[*Oliarus nyanzae* ssp. *inermis*] FENNAH, 1957: 35 (in partim).



Figs 43 to 46: *Pentastiridius moestus* (Stål)

43: aedeagus, holotype *Oliarus nyanzae*; 44: dextral process of aedeagus, specimen Kayumbe-Mukuba; 45: aedeagus, holotype *Oliarus nyanzae gracilior*; 46: vertex.

Figs 48 and 49: *Pentastiridius inermis* (Fennah)

48: aedeagus, specimen Gembu-Yelwa; 49: dextral process of aedeagus, holotype. Scale A: 46; B: others - 0.2 mm.

Material examined. - Holotype ♀, "Caffraria", "J. Wahlb.", NR.

Additional material: Lectotype ♀ *Cixius funebris*, by present designation, "Natal", BMNH; holotype ♂ *Oliarus nyanzae*, Ruanda, Kinazi, 1600 m, terr. nyanza (P. BASTLEWSKY), 5/8-I-1953, KMMA; 1 ♀ holotype *Oliarus nyanzae* ssp. *gracilior*, Zaïre, Katanga, Nyonga, V-1925 (G.F. DE WITTE), KMMA; 1 ♂ paratype *Oliarus nyanzae* ssp. *inermis*, Mongende, 17-IV-1921 (H. SCHOUTEDEN), KMMA; 148 additional specimens from 52 localities in Uganda, Kenya, Zaïre, Ruanda, Tanzania, Malawi, Zimbabwe, Mozambique, Namibia, Swaziland, Botswana, South Africa.

Description. - General colour black with yellowish carinae and borders. Colour of tegmina variable, from hyaline to dark brown; vertex broader than long (17: 21); chaetotaxy (12-15)/(10-12).

Length: 4.5 - 6 mm, three males from Winklespruit (S.A.) 3.7 mm.

♂ genitalia: Aedeagus with unequal apical spines, the first one shorter and recurved. Flagellum with a terminal spine. Dextral process variable in shape, usually blunt, rounded, sometimes shallowly excavated apically.

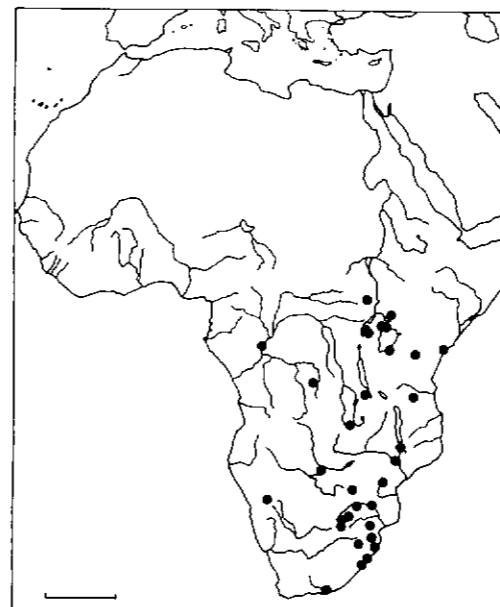


Fig. 47: Distribution of *Pentastiridius moestus* (Stål).
Scale: 1000 km.

Diagnosis. - A variable species in size as well as in colour. Specimens with brown tegmina can be distinguished from *P. nigripennis* by the blunt dextral process on the aedeagus. *P. moestus* is distinguished from *P. inermis*, *P. kassalanus*, *P. badiensis* and *P. virgultivagus* by the presence of a terminal spine on the flagellum.

Distribution. - *P. moestus* is one of the commonest species. It occurs in the eastern highlands and probably in the major part of Africa south of the equatorial forest. Since most of the records are situated in areas higher than 1000 m above sea level, this could be one of the factors which explain its absence in West-Africa.

Remarks. - This species was sampled in both the dry and rainy season. The data published by FENNAH (1958) and DLABOLA (1979) could not be checked; most probably they concern another, related species (*P. inermis*?).

Pentastiridius inermis (FENNAH) comb. n.
(Fig. 48 & 49)

Oliarus nyanzae ssp. *inermis* FENNAH, 1957: 35, fig. 20 c-g.
Oliarus nyanzae inermis FENNAH; SYNAVE, 1968: 445.
[*Oliarus moestus* (STÅL)]; LINNAVUORI, 1973: 91; VAN STALLE, 1982: 4; 1984: 113.

Material examined. - Holotype ♂, Zaïre, Haut Uele, Watsa (L. BURGEON), KMMA.
Paratypes: 1 ♀, Leopoldville, 15-IX-1910 (Dr R. BEQUAERT), KMMA; 1 ♀, Plaine d'Uvira, 23-VII-1912 (Dr STAPPENS), KMMA; 1 ♂ (= *P. moestus*), Mongende, 17-IV-1921 (H. SCHOUTEDEN), KMMA.

Additional material: 1 ♂, Nigeria, NE State, Gamba-Yelwa, 22-VIII-1973, KBIN; 1 ♂, NW. State, Mokwa, 14-VIII-1970 (P.H. WARD), BMNH; 1 ♂, Zaria, Samaru, 6-XII-1972, CL.; 2 ♂, Cameroon, Bota, 15/20-IV-1973, KBIN; 1 ♂, small Mount Cameroon, 17-III-1981, on light, KBIN; 1 ♂, Buea-Kumba, 20-VI-1973, CL.; 1 ♂, Sudan, Equatoria, Nimule, 11/13-III-1963, CL.; 1 ♂, Loka forest, 8/10-IV-1963, CL.; 2 ♂, Yei-Maridi, 13/15-IV-1963, CL.; 1 ♂, Ibba-Nimule, 10/11-III-1963, CL.; 4 ♂, Kenya, Meru, VII-1943 (VAN SOMEREN), BMNH; 1 ♂, Ruiru Falls, VII-1937 (A.F.J. GEDYE), NMK; 1 ♂, Nakuru, 1949 (E. PINHEY), NMK; 1 ♂, Zaïre, Parc nat. Albert, Mass. Ruwenzori, 26-IV-1958 (P. VANSCHUYTBROECK), KMMA; 1 ♂, Parc nat. Albert, secteur Tshiaberimu Kalindera (2720 m), 23/30-VIII-1953, KMMA; 1 ♂, Kivu, Mugenza, 27-XII-1966, SMN; 7 ♂, Parc nat. Garamba, 5-IV-1952 (miss. H. DE SAEGER), KMMA, KBIN.

Description. - As the preceding species, also variable in size and colour; chaetotaxy (11-15)/(8-11).

♂ genitalia: apical spines on aedeagus equal in length or nearly so, dextral process blunt apically, rounded, or shallowly excavated; flagellum without spine.

Diagnosis. - *P. inermis* differs from *P. moestus* in the absence of a terminal spine on the flagellum; it differs from *P. kassalanus* in the shape of the apical spines.

Distribution. - Recorded from Nigeria, Cameroon, northern Zaïre, the Sudan and Kenya. The localities are situated in the Guinean savanna, the most western collecting site being Mokwa (5° east). Along the East-African mountains its range seems to overlap with *P. moestus*. However, due to the absence of exact data concerning the collecting sites situated in this area it is impossible to conclude whether or not they are sympatric here.

Pentastiridius kassalanus sp. n.
(Fig. 50)

[*Oliarus moestus* ssp. *virgultivagus* HESSE]; LINNAVUORI, 1973: 91, fig. 30 h.

Material examined. - Holotype ♂, Sudan, Kassala prov., Kassala-Haiya, 1/3-XII-1962, CL.

Description. - General colour black, tegmina hyaline. Vertex broader than long (18:28); chaetotaxy (15)/(10).

Length: 5 mm.

♂ genitalia: aedeagus with two identical apical spines; ventral spine relatively short; flagellum without spine; dextral process with a blunt apex.

Pentastiridius badiensis sp. n.
(Fig. 51)

[*Oliarus sudanicus* LALLEMAND]; LINNAVUORI, 1973: 90 (in partim).

Material examined. - Holotype ♂, Senegal, Parc nat. Niokolo-Koba, Badi, 3-I-1980 (B. SIGWALT), MNHN.

Paratypes: 2 ♀, same locality, MNHN; 1 ♂, Sudan, Equatoria, Kapoeta-Boma, 26/27-III-1963, ZMH; 1 ♂, Senegal, 3 km SSW Toubakouta, 10 km S. Ziguinchor, 4-III-1977, Lund Mus.

Description. - General colour black; tegmina slightly fumated with brown, veins and stigma brown; vertex broader than long (14:22), chaetotaxy (15-17)/(10-12).

Length: 4.5 mm.

♂ genitalia: aedeagus with two unequal apical spines, the first one recurved; flagellum without spine; dextral process blunt, rounded, to shallowly excavated in a paratype from the Sudan.

Diagnosis. - *P. badiensis* differs from other species without spine on flagellum in the shape of one of both apical spines which is recurved instead of straight.

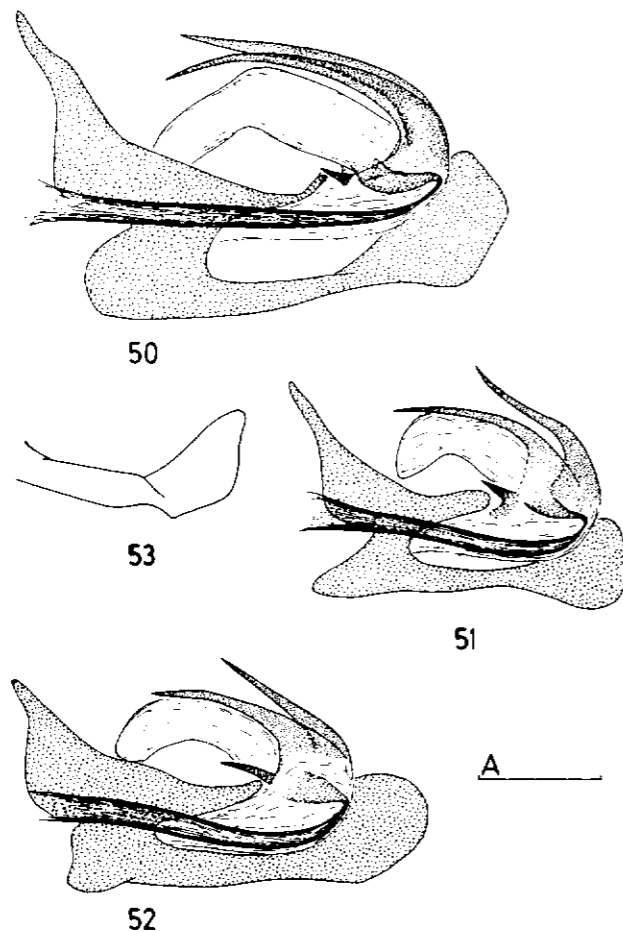


Fig. 50: *Pentastiridius kassalanus* sp. n., aedeagus.

Fig. 51: *Pentastiridius badiensis* sp. n., aedeagus.

Figs 52 and 53: *Pentastiridius virgultivagus* (Hesse)

52: aedeagus, specimen from Angola; 53: dextral process of aedeagus, specimen from Cape Town. Scale A: 0.2 mm.

Pentastiridius virgultivagus (HESSE) comb. n.
(Fig. 52 & 53)

Oliarus virgultivagus HESSE, 1925: 153, pl. VII, fig. 5.

Oliarus virgultivagus HESSE; SYNAVE, 1953a: 25.

nec *Olianus* (sic) *moestus virgultivagus* HESSE; SYNAVE, 1953b: 25.

nec *Oliarus moestus* ssp. *virgultivagus* HESSE; LINNAVUORI, 1973: 91, fig. 30 h.

Material examined. - Holotype ♀, Namakunde, Ovamboland, II-1923, SAM.

Additional material: 1 ♂, Angola, Sa da Banderra, 22/24-II-1972, BMNH; 1 ♂, South-Africa, Cape Town, XI-1927, BMNH.

Description. - General colour black, vertex broader than long (15: 25). Tegmina hyaline with dark veins; chaetotaxy (10-13)/(7-11).

Length: 4.5 - 5 mm.

♂ genitalia: aedeagus with two unequal apical spines, straight or nearly so; dextral process rounded apically. Flagellum without spine. Figures drawn after a specimen from Angola.

Pentastiridius latus (MELICHAR) comb. n.

Oliarus latus MELICHAR, 1905: 281.

Oliarus latus MELICHAR; SYNAVE, 1958: 159.

Material examined. - Lectotype ♀, by present designation, Tanzania, Kiboteni, Bomole, MM.

Description. - Vertex broader than long (length: 0.35, width 0.45 mm). Mesonotum dark brown, a spot situated laterally from the longitudinal keels paler. Tegmina hyaline, veins yellowish brown.

Length tegmina: 5.8 mm.

Remarks. - Dr P. LAUTERER kindly provided me some notes and drawings from the lectotype which is stored in the Moravské Museum and which I could not examine personally. Apparently this species belongs to the group of *Pentastiridius moestus* and might be conspecific with one of these species. Topotypical material will be needed to solve this problem.

There is only one female present in the collections of the Moravské Museum. The second specimen mentioned in the original description was not found.

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