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About two species of liochelid scorpions collected in Western Africa (Scorpiones, Liochelidae)

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(With 18 figures)

Abstract

Study of two species of liochelid scorpions collected in Western Africa resulted in the description of two new subspecies. The first, from Congo (ex Zaire), is closely related to *Iomachus politus* Pocock, 1896, distributed only in Eastern Africa. The second, from Angola, is closely related to *Opisthacanthus africanus* Simon, 1876, known from some countries in Western Africa.

Introduction

Scorpions of the family Liochelidae have been the subject of several studies and revisions in the last twenty years (e.g. Lourenço 1983, 1985, 1987, 1989, 1997, Monod 1999, Striffler 2001). Nevertheless, new discoveries always remain possible as was the case with the description of a new genus, *Palaeocheiloctonus*, from Madagascar (Lourenço 1996).

The composition of most liochelid genera have remained relatively stable in recent years with few descriptions of new species. Some were recorded in the genera *Opisthacanthus* (see Lourenço 1980, 1981), *Liocheles* (Francke & Lourenço 1991; Monod, in preparation), *Iomachus* (Bastawade 1986), and *Chiromachetes* (Lourenço 1997).

The present study of a small collection of liochelid scorpions from Occidental Africa resulted in the description of two new subspecies. The first was collected in Congo (ex Zaire, now: Democratic Republic of the Congo), and is closely related to *Iomachus politus* Pocock, 1896 which is distributed over several countries in Eastern Africa. The second was collected in Angola and is closely related to *Opisthacanthus africanus* Simon, 1876, known from countries in Western Africa including Angola (Cabinda), Cameroons?, Republic of the Congo and Gabon.

Historical account of the genus *Iomachus* Pocock, 1893

In a general article dedicated to the classification of scorpions, Pocock (1893) proposed a new genus, *Iomachus*, to accommodate one species, *Hormurus laeviceps*, Pocock 1890 from South of India. The new genus

was defined mainly on the structure of the tarsi. These are compressed and armed with a single series of spiniform teeth, whereas in *Hormurus* (today known as *Liocheles* Sundevall, 1833), the tarsi are armed with lateral setae.

Subsequently Pocock described three other species in the genus *Iomachus*: *I. politus* (Pocock, 1896) from Eastern Africa, and *I. punctulatus* (Pocock, 1897) and *I. nitidus* (Pocock, 1900), both from South of India. A few decades later, two other species were added to *Iomachus*: *I. borana* (Di Caporiacco, 1939) from Ethiopia and *I. exsul* (Werner, 1939) from Costa Rica. This last species has been the result of misidentification, and later transferred to the genus *Chactas* Gervais, 1844 (Lourenço 1998). Finally, a seventh species was described by Bastawade (1986), also from India. More recently the genus was revised by Striffler (2001), as the subject of a MSc thesis in which this author concluded that only one species was present in Eastern Africa, *I. borana*, the latter being a junior synonym of *I. politus*.

Description of a new subspecies for *Iomachus politus* Pocock, 1896

Iomachus politus occidentalis ssp. n. (Figs 1-7)

DIAGNOSIS: The new subspecies is similar to *Iomachus politus typicus* in most morphological features. It can, however, be distinguished from the Oriental subspecies by (i) darker coloration of the pedipalps, chelicerae and coxapophysis, (ii) the position of trichobothrium d_2 of the patella, which is almost on the internal face.

The geographical distributions of the two subspecies are markedly different.

TYPE MATERIAL: One female holotype. Western Africa, Democratic Republic of the Congo (ex-Zaire), Befori, XII/1963 (C. Allauaud leg.). Deposited in the Zoologisches Museum Hamburg (ZMH Acc. No. A27/03).

ETYMOLOGY: The subspecific name makes reference to the geographical position of the new subspecies in Africa.

Coloration. Basically brownish to blackish brown with some dark zones on the pedipalp carinae. Carapace blackish brown with a paler triangular zone on the posterior edge; median and lateral eyes surrounded with black pigment. Tergites brownish with two longitudinal series of yellowish spots. Metasomal segments blackish brown; vesicle brownish with two lateral yellow strips; aculeus yellowish. Chelicerae blackish brown; base of fingers blackish; posterior half a diffuse variegated fuscous colour; fingers blackish at their base and yellowish at their extremity. Pedipalps blackish brown; extremity of fingers reddish. Venter and sternites I-VI yellowish; pectines paler than sternites; sternite VII and coxapophysis blackish brown; legs brownish.

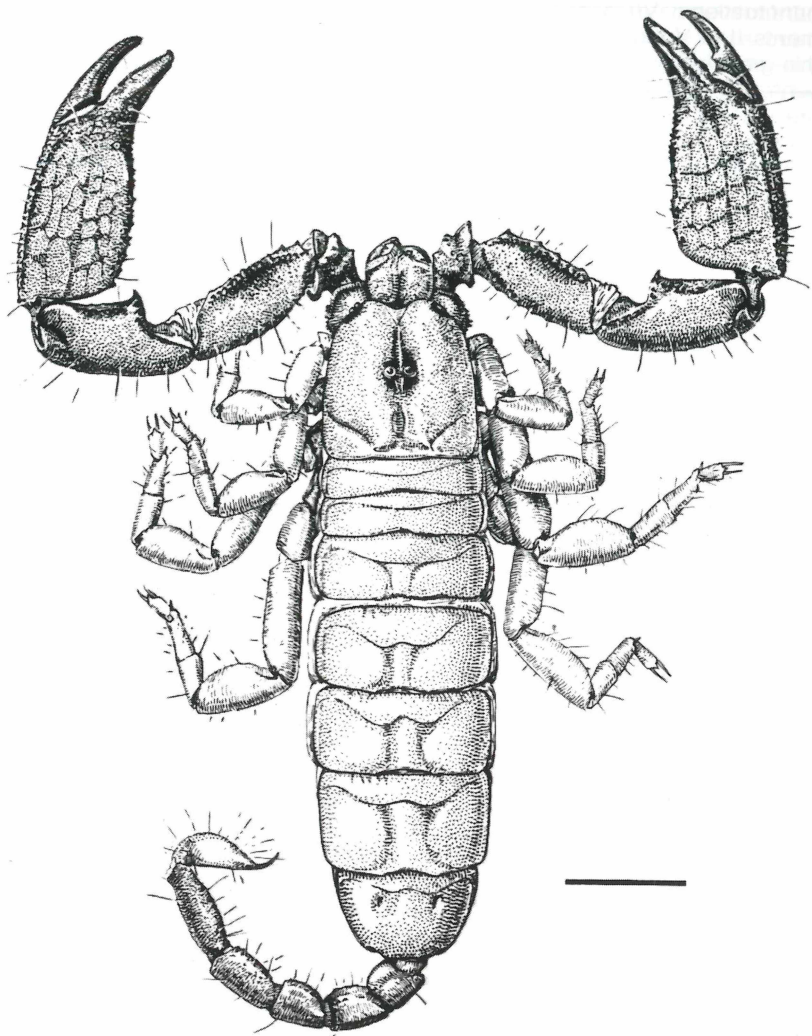
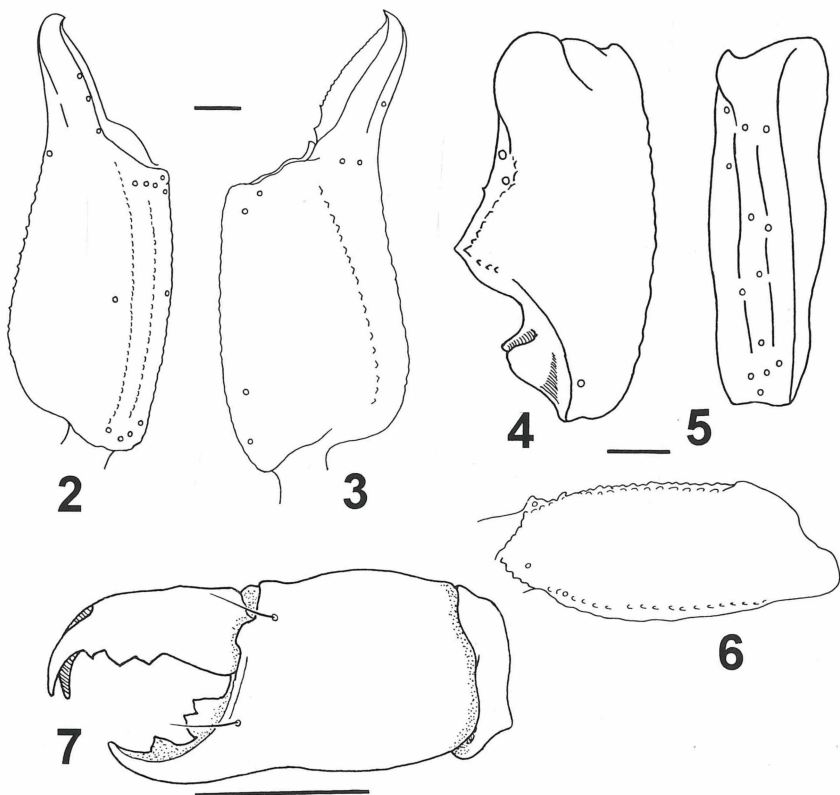


Fig. 1. *Iomachus politus occidentalis* ssp. n.: holotype (♀). (Scale bar = 5 mm).

M o r p h o l o g y . Carapace lustrous and acarinate, with no punctuation; furrows shallow. Anterior margin with a moderate concavity, reaching as far as the level of the 2nd lateral eye. Median ocular tubercle flattened and slightly anterior to the centre of carapace; median eyes moderate, separated by less than one ocular diameter; three pairs of lateral eyes. Sternum pentagonal, longer than wide. Tergites acarinate, smooth and shiny without punctuations. Pectinal tooth count 8-8. Sternites smooth and shiny without

punctuations; VII acarinate. Metasomal segment I wider than long; segments II to V longer than wide, almost smooth and shiny, except for some thin granulations on segments I-II; segment V with a few sparse granulations ventrally. All carinae absent in segments I-IV, except for the dorsal which are vestigial. Segment V smooth and rounded. Pedipalps: Femur with dorsal internal, dorsal external and ventral internal carinae strong, tuberculate; ventral external carinae weak; dorsal and ventral faces with a thin granulation; internal face median granulose. Patella smooth lustrous; dorsal internal, and ventral internal carinae moderate; ventral external and external carinae moderate to weak; other carinae weak to vestigial. Tibia moderately to strongly granular; especially on internal and external faces; dorsal marginal, external secondary, and ventrointernal carinae moderate; ventral median carina strong; other carinae vestigial. Chelicerae typical of the family Ischnuridae (Vachon 1963). Trichobothriotaxy type C; orthobothriotaxic (Vachon 1974). Legs: tarsi with two lateral rows of spines and several small median spines, surrounded by several long setae. Spurs moderate.



Figs 2-7. *Iomachus politus occidentalis* ssp. n. (trichobothriotaxy: 2-6): **2,3** - tibia, dorsal external and ventral internal aspects; **4,5** - patella, dorsal and external aspects; **6** - femur, dorsal aspect; **7** - chelicera. (Scale bars = 1 mm).

Comments: As explained by Striffler (2001), there are some doubtful records for *I. politus* in the literature. Among others, this species has been cited from South Africa and Namibia. In all cases, the most southward confirmed record of *I. politus* in Eastern Africa is Beira, Mozambique. The record for Namibia is most certainly due to mislabelling. Besides, no humid habitats similar to those in which *I. politus* lives in Eastern Africa exist in Namibia. The location in Congo in which the new subspecies was collected can be described as humid tropical forest.

History of the study of *O. africanus*

In a short note on the arachnids of the Congo, Simon (1876) described *O. africanus* from three specimens collected by M. Petit in Landana, Cabinda (today Angola). This species has subsequently been the subject of several citations and redescriptions. Some of the records from South Africa, Mozambique and Sierra Leone can, however, be considered as doubtful, as they are the result of mislabelling and misidentification.

More recently, the Simon's type specimen was rediscovered (Lourenço 1982), and this species was included in the revision of the genus *Opisthacanthus* (Lourenço 1985, 1987). During this revision, some juvenile specimens, collected by A. de Barros Machado in Mabete, Caungula (in the region of Lunda in Angola), have been classified among other specimens of *O. africanus*. The present study of adult male and female specimens leads to the description of a new subspecies.

A new subspecies for *Opisthacanthus africanus* Simon, 1876

Opisthacanthus africanus pallidus ssp. n. (Figs 14-17)

DIAGNOSIS: The new subspecies is similar to *Opisthacanthus africanus typicus* (Figs 8-13) in most of its morphological features. It can, however, be distinguished from the *O. africanus africanus* by much paler coloration of the body, pedipalps, chelicerae and legs.

The geographical distribution of the two subspecies could be defined as sympatric, but, in fact, the new subspecies is probably isolated in the region of Lunda in Angola.

TYPE MATERIAL: Female holotype. Western Africa, Angola, Lunda, Zovo, Mabete, Caungula (8.07 S 18.08 E, alt. 850 m), 17-19/VII/1962 (A. de Barros Machado leg.). Deposited in the Zoologisches Museum Hamburg (ZMH Acc. No. A28/03). Paratypes: male, 4 juveniles, locality data as above (ZMH Acc. No. A29/03).

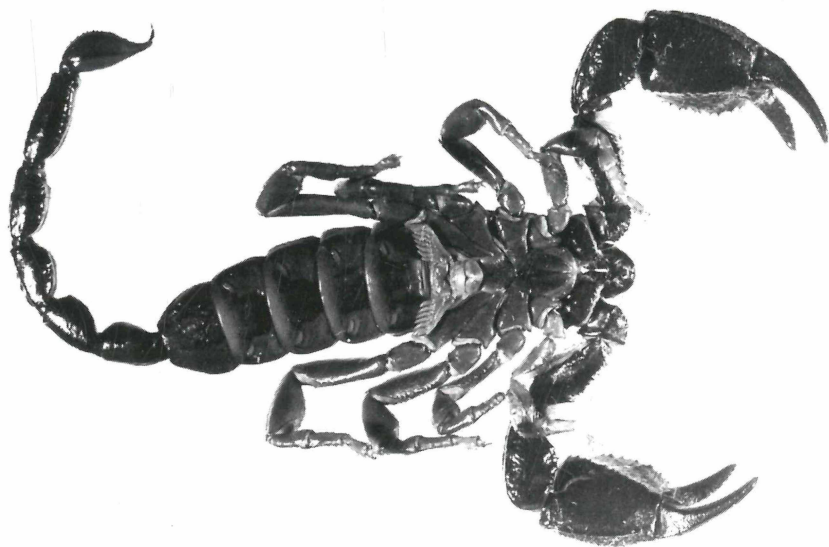
NOTE: Two juveniles of *O. africanus africanus* collected in Sebiti (= Sibiti: Republic of the Congo) by C. Alluaud are also deposited in the Zoologisches Museum of the University of Hamburg (ZMH Acc. No. A30/03).

ETYMOLOGY: The subspecific name makes reference to the pale colour of the individuals of this population.

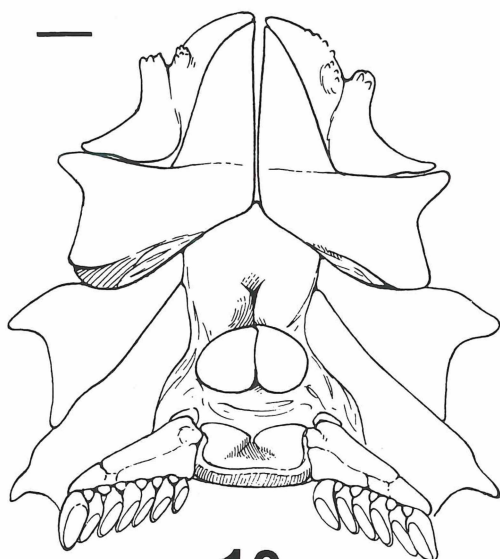
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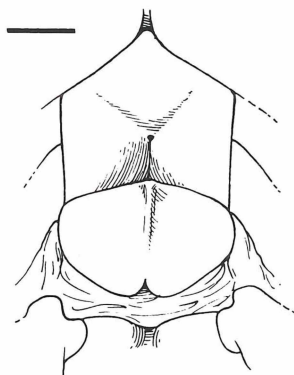
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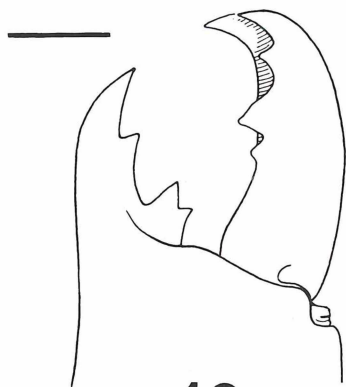
Figs 8-9. *Opisthacanthus africanus africanus* Simon: holotype ♂, dorsal and ventral aspects, respectively.



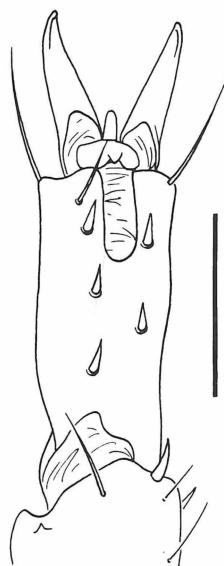
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Figs 10-13. *Opisthacanthus africanus africanus* Simon: **10** - pectines, genital operculum, sternum and coxapophysis (holotype ♂); **11** - sternum and genital operculum (♀); **12** - chelicera (holotype ♂); **13** - tarsus leg IV (holotype ♂). (Scale bars = 1 mm).



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Figs 14-17. *Opisthacanthus africanus pallidus* Simon ssp. n.: 14, 15 - holotype ♀, 16,17 - paratype ♂. (Scale bars = 20 mm).

Description (based on female holotype).

COLORATION. Basically yellowish with dark zones on the pedipalp carinae. Carapace yellowish with reddish zones laterally; median and lateral eyes surrounded with brownish pigment. Tergites pale yellow. Metasomal segments and vesicle yellowish; aculeus reddish. Chelicerae yellowish, without any diffuse variegated fuscous colour; fingers reddish. Pedipalps reddish yellow; fingers darker than hand; carinae blackish brown. Venter and sternites yellowish; pectines paler than sternites; legs yellowish.

M o r p h o l o g y. Carapace lustrous and acarinate, with a thin granulation on the central zone; furrows shallow. Anterior margin with a strong concavity reaching back almost as far as the level of the 3rd lateral eye. Median ocular tubercle flattened and situated at the centre of carapace; median eyes large, separated by less than one ocular diameter; three pairs of lateral eyes. Sternum pentagonal, slightly wider than long. Tergites acarinate, smooth and shiny with some punctuations. Pectinal tooth count 7-7. Sternites smooth and shiny without punctuations; VII acarinate. Metasomal segments longer than wide, almost smooth and shiny, except for some sparse granulations on the ventral surface of segment V. Carinae absent from segments I-IV, except for the dorsal carinae which are vestigial. Segment V smooth and rounded. Pedipalps: Femur with dorsal internal, dorsal external and ventral internal carinae strong, tuberculate; dorsal face with thin granulation; internal face moderately granulose. Patella smooth and lustrous; dorsal internal, and ventral internal carinae moderate; ventral external and external carinae moderate to weak; other carinae weak to vestigial. Tibia moderately to strongly granular; specially on internal and external faces; dorsal marginal, external secondary, and ventrointernal carinae moderate; ventral median carina strong; other carinae vestigial. Chelicerae typical of the family Ischnuridae (Vachon 1963). Trichobothriotaxy, type C; orthobothriotaxic (Vachon 1974). Legs: tarsi with two lateral rows of spines. Spurs moderate.

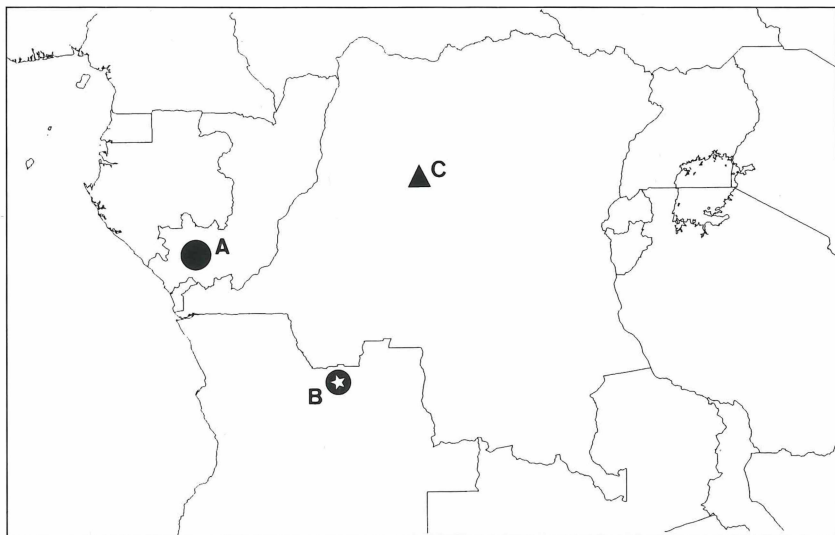


Fig. 18. Map showing the type localities of the two new subspecies, and Sibiti. (A: *Opisthacanthus africanus africanus*, Republic of the Congo. B: *Opisthacanthus africanus pallidus* ssp. n., Democratic Republic of the Congo. C: *Iomachus politus occidentalis* ssp. n., Angola).

ECOLOGICAL COMMENTS: According to A. de Barros Machado (*in litt.*), the specimens were collected in an area where the forest was not very dense. The specimens were found all together in a hole of a tree (*Hiemilignosa*), about 1 meter from the ground. The fact that adults (male and female) and juveniles (four of two different instars) were found together, suggests that this population exhibits a level of social behaviour, as has already been demonstrated for other species of *Opisthacanthus* Peters, 1861 (see Polis & Lourenço 1986).

Table I. Measurements (in mm) of the holotype (♀) *Iomachus politus occidentalis* ssp. n. and the holotype (♀) and paratype (♂) of *Opisthacanthus africanus pallidus* ssp. n.

	<i>I. p. occidentalis</i> ssp. n.	<i>O. a. pallidus</i> ssp. n.	
	♀	♀	♂
Total length	42.2	58.2	55.8
Carapace:			
- length	6.3	10.1	9.1
- anterior width	4.3	6.8	6.2
- posterior width	6.2	10.6	9.4
Metasoma, segment I:			
- length	1.6	3.7	3.7
- width	1.9	3.2	3.1
Metasoma, segment V:			
- length	3.9	6.4	6.3
- width	1.4	2.7	2.6
- depth	1.3	2.7	2.6
Vesicle:			
- width	1.3	2.8	2.8
- depth	1.0	3.1	3.0
Femur:			
- length	5.9	6.9	6.8
- width	2.3	3.7	3.8
Patella:			
- length	6.3	7.8	7.8
- width	2.4	3.9	3.9
Tibia:			
- length	11.2	16.4	15.5
- width	3.8	6.2	5.8
- depth	2.3	7.5	7.4
Movable finger:			
- length	4.2	8.2	7.6

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