



ELSEVIER

Contents lists available at ScienceDirect

Comptes Rendus Biologies

www.sciencedirect.com



Biodiversity/Biodiversité

Scorpions from the Island of Côn Sơn (Poulo Condore), Vietnam and description of a new species of *Chaerilus* Simon, 1877 (Scorpiones, Chaerilidae)

Scorpions de l'île de Côn Sơn (Poulo Condore), Vietnam et description d'une nouvelle espèce de Chaerilus Simon, 1877 (Scorpiones, Chaerilidae)

Wilson R. Lourenço

Muséum national d'histoire naturelle, département systématique et évolution, UMR7205, CP 053, 57, rue Cuvier 75005 Paris, France

ARTICLE INFO

Article history:

Received 17 June 2011

Accepted after revision 27 July 2011

Available online 9 September 2011

Keywords:

Scorpion fauna

Poulo Condore

Vietnam

Chaerilidae

Chaerilus

New species

Mots clés :

Faune des scorpions

Poulo Condore

Vietnam

Chaerilidae

Chaerilus

Nouvelle espèce

ABSTRACT

The scorpion fauna of the Island of Côn Sơn (Poulo Condore), Vietnam is briefly discussed and a new species, *Chaerilus phami* sp. n. is described. The new species is morphologically distinct from all the other species of *Chaerilus* described from the mainland in Vietnam.

© 2011 Académie des sciences. Published by Elsevier Masson SAS. All rights reserved.

R É S U M É

La faune des scorpions de l'île de Côn Sơn (Poulo Condore), Vietnam est discutée brièvement et une nouvelle espèce, *Chaerilus phami* sp. n. est décrite. La nouvelle espèce est morphologiquement distincte de toutes les autres espèces de *Chaerilus* décrites du Vietnam continental.

© 2011 Académie des sciences. Publié par Elsevier Masson SAS. Tous droits réservés.

1. Introduction

The status and composition of the genus *Chaerilus* was the subject of a recent taxonomic analysis [1] and two distinct groups of species were defined: the “variegatus species-group”, and the “truncatus species-group”.

The identity of Southern Vietnam (Indochina) populations of *Chaerilus* was systematically misidentified by Fage [2–4], first as *Chaerilus celebensis* Pocock, 1894, and

subsequently as *Chaerilus rectimanus* Pocock, 1899 and/or *Chaerilus variegatus* Simon, 1877. Finally, Kovařík [5] described one population of Southern Vietnam as *Chaerilus petzelkai*. Subsequently, this species was confirmed in Vietnam, and properly redescribed and illustrated by Lourenço and Zhu [6].

Until now, only three species have been described from Vietnam: *C. petzelkai* and *Chaerilus juliettae* Lourenço, 2011 from the South region of the country and *Chaerilus vietnamicus* Lourenço and Zhu, 2008 from the North range [1,6]. These belong to two distinct groups of species.

E-mail address: arachne@mnhn.fr.

The scorpion fauna of the Island of Côn Sơn (Poulo Condore), Vietnam was first discussed by Fage [2]. In this publication, he described an interesting new genus and species, *Hormiops davidovi*, endemic to the island [7] (a recent record of this species to Tioman Island, W of the Malaysia is most certainly a case of misidentification [8] and will require further investigation). Fage [2] also made reference to one species of *Chaerilus*, which he associated, to *C. variegatus* and/or *Chaerilus robinsoni* Hirst, 1911. A new study of the specimens cited by Fage [2], demonstrated that the population from Poulo Condore corresponds to a new species, describe below.

The specimens studied by Fage [2–4] have been collected during the expeditions of the French zoologist of Russian origin, Pr Constantine Dawydoff, who in 1929–1934 and 1938–1939 conducted fundamental zoological research in Indochina in the Institute of Oceanography at Cau Da (Cauda) near Nha-Trang (now Vietnam). The scorpion species *H. davidovi* Fage, 1933 from Poulo Condore was, by the way, named in homage to C. Dawydoff [2].

Constantine Dawydoff (1877–1960) was a very active field biologist. He studied zoology in St. Petersburg University from 1896, and worked under A. O. Kovalevsky. He got his doctoral degree (on nemertines) in 1915; in 1922, fled from Soviet Russia to France, worked in the laboratories of M. Caullery (Paris) and O. Dubosque (Banyuls-sur-Mer). Dawydoff worked twice for a long time in Indochina (1929–1934 and 1938–39). Described from Indochina over 140 species of sponges, over 500 species of coelenterates, almost 100 species of Bryozoa [9,10]. Even if most of the zoological efforts done by C. Dawydoff in Indochina were devoted to marine biology, he also intensively collected terrestrial groups, including Arachnida. The results published by Fage [2–4] attest to this, but also others such as the study on Pseudoscorpiones [11].

2. The Côn Dao archipelago

Although the Côn Dao archipelago had an infamous historical significance as the site of several prisons used by the French colonial regime and South Vietnamese regime, it was subsequently transformed in a National Park. Côn Dao National Park is centred on an archipelago of 14 islands on the coast of southern Vietnam (8°43′00″N–106°36′00″E), the largest of which is Côn Sơn. The topography of Côn Sơn Island is mountainous, and dominated by a granite ridge, which runs from southwest to north-east, sheltering the bays on both sides of the island from strong winds. The highest points on the island are the summits of Mount Thanh Gia and Mount Chua, at 577 and 515 m respectively. The smaller islands reach a maximum elevation of 200 m.

Although there are no permanent watercourses on any of the islands, but only seasonal streams in the rainy season, water is plentiful in this season. Côn Sơn Island and many of the other islands of the archipelago are extensively forested. According to the revised investment plan, the national park supports 4905 ha of forest, equivalent to 81% of the total terrestrial area. To date, 882 vascular plant species have been recorded at the

national park. One outstanding feature of Côn Dao's flora is the 44 plant species that were discovered for the first time on the islands.

To date, 24 species of mammals, 69 species of birds and 42 species of reptiles and amphibians have been recorded at the national park. Although the number of species is relatively low, the density of individual species is often high, and there are a number of endemic taxa. For example, a number of bird species recorded at Côn Dao are not known from any other site in Vietnam [12].

3. Methods

Illustrations and measurements were made with the aid of a Wild M5 stereomicroscope, which has a drawing tube (camara lucida) and an ocular micrometer. Measurements follow Stahnke [13] and are given in millimeters (Fig. 1). Trichobothrial notations follow Vachon [14], and morphological terminology mostly follows Hjelle [15].

4. Taxonomic treatment

Chaerilidae Pocock, 1893
Chaerilus Simon, 1877
Chaerilus phami sp. n.

Material. Vietnam, Côn Sơn Island (Poulo Condore), 10/IV/1934 (C. Dawydoff leg.). Female holotype, male paratype. Deposited in the Muséum national d'Histoire naturelle, Paris (MNHN-RS-0604-RS-5262).

4.1. Diagnosis

Species of small size in relation to that of the other species in the genus, 20.7 mm in total length. General coloration yellowish, marked with some diffused variegated reddish-brown spots. Carapace moderately narrowed toward the anterior edge; with several large granules forming a pair of longitudinal carinae; anterior margin weakly emarginated; furrows shallow. Metasomal carinae moderately marked; ventral carinae weakly marked on segments I and II, moderately marked on segments III and IV; latero-ventral and ventral carinae on segment V composed of spinoid granules. Telson with a pear-like shape; aculeus elongated in male, weakly curved. Pedipalps elongated in male; dentate margins of fixed and movable fingers with 8–8 rows of granules. Pectinal tooth count 5–5 in male and female. Genital operculum plates have an almost rounded shape. Trichobothriotaxy of type B, orthobothriotaxic. Hemispermatophore unknown.

4.2. Relationships

Chaerilus phami sp. n. shows morphological similarities with *C. petrzekai* described from the Vietnam continental land. The new species can, however, be readily distinguished by the following combination of characters:

- a pale coloration with diffused variegated pigmentation;
- carinae on carapace and on ventral aspect of metasomal segments I–II;

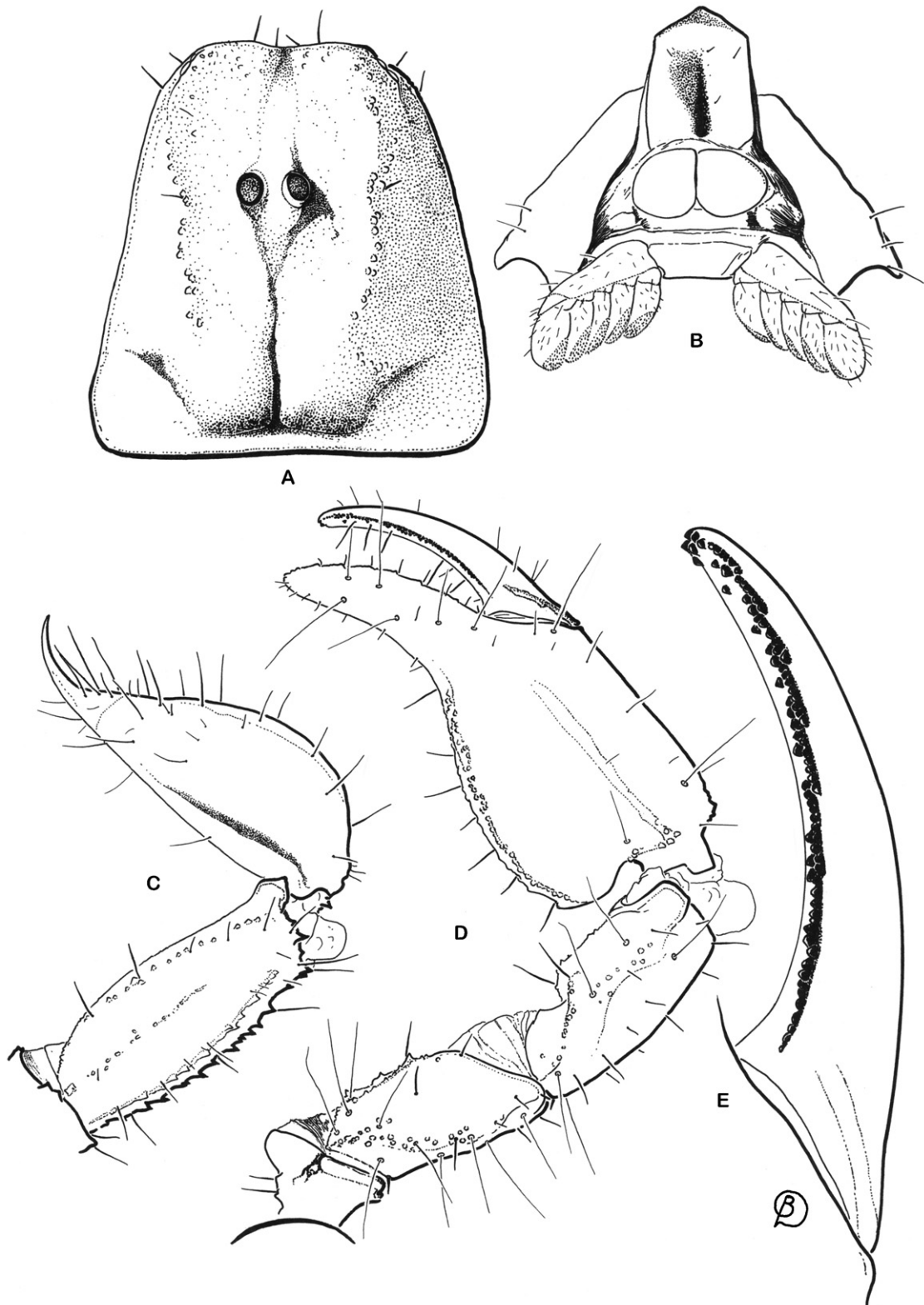


Fig. 1. *Chaerilus phami* sp. n. Female holotype. A. Carapace. B. Ventral aspect, showing sternum, genital operculum and pectines. C. Metasomal segment V and telson, lateral aspect. D. Right pedipalp, dorsal aspect, showing trichobothria. E. Cutting edge of movable finger with rows of granules.

- pedipalp and telson elongated in male;
- genital operculum rounded in shape.

Etymology. Patronym in honour of Dr Dinh-Sac Pham of the Institute of Ecology and Biological Resources (IEBR), of the Academy of Science and Technology (VAST), Vietnam, for his interest in the study of Vietnamese scorpions.

4.3. Description

4.3.1. Coloration

Basically yellowish to pale yellow, marked with diffused variegated reddish-brown. Carapace yellowish, with some spots posteriorly. Tergites and metasomal segments yellowish with diffused spots. Telson yellowish with diffused spots; tip of aculeus reddish. Chelicerae yellowish without spots; teeth reddish. Pedipalps reddish-yellow; dentate margins of fingers reddish. Legs yellowish without spots. Venter and sternites yellowish; pectines pale yellow.

4.3.2. Morphology

Carapace moderately narrowed anteriorly; weakly emarginated; with some large granules forming two longitudinal carinae; furrows shallow. Two pairs of lateral eyes, and one pair of moderate median eyes, about 2.5 times the size of lateral eyes; median eyes anterior to the centre of the carapace. Tergites smooth; carinae obsolete. Sternum pentagonal, longer than wide; genital operculum plates with an almost rounded shape. Pectinal tooth count 5-5 in female holotype and male paratype. Sternites smooth with spiracles small and oval-shaped; carinae absent from VII. Metasomal segments I to III wider than long; segments IV and V longer than wide. All the carinae moderately granular; ventral carinae weakly marked on segments I and II, moderately marked on segments III and IV; latero-ventral and ventral carinae on segment V composed of spinoid granules; latero-dorsal carinae strongly marked. Vesicle with a pear-like shape, elongated in male, smooth; aculeus short and weakly curved. Pedipalps elongated in male, but not in female; femur with five carinae. Patella with seven vestigial carinae. Chela weakly enlarged and with eight vestigial carinae. Tegument almost smooth. Fixed and movable fingers shorter than manus, with 8-8 rows of granulations on the dentate margins. Chelicerae characteristic of the family Chaerilidae [16]. Trichobothriotaxy of type B; orthobothriotaxic [14]; femur with 9 trichobothria, patella with 14, and chela with 14. Legs with pedal spurs moderately developed. Tarsi with two rows of thin setae. Hemispermatophore unknown.

4.3.3. Morphometric values (in millimeters) of the female holotype

Total length (including telson), 20.7. Carapace: length, 3.2; anterior width, 1.6; posterior width, 3.2. Mesosoma

length, 6.9. Metasomal segments. I: length, 0.9; width, 1.7; II: length, 1.0; width, 1.5; III: length, 1.2; width, 1.4; IV: length, 1.5; width, 1.2; V: length, 2.6; width, 1.2; depth, 1.2. Telson length, 3.4. Vesicle: width, 1.4; depth, 1.2. Pedipalp: femur length, 2.3, width, 1.2; patella length, 2.4, width, 1.3; chela length, 5.2, width, 1.8, depth, 2.2; movable finger length, 2.7.

Disclosure of interest

The author declares that he has no conflicts of interest concerning this article.

Acknowledgements

I am most grateful to Bernard Duhem (MNHN, Paris) for preparing the illustrations, to Elise-Anne Leguin (MNHN, Paris) for the preparation of the plates and to Pr John L. Cloudsley-Thompson, London and Dr Victor Fet, Marshall University, for useful comments on the manuscript.

References

- [1] W.R. Lourenço, The genus *Chaerilus* Simon, 1877 (Scorpiones Chaerilidae) in Vietnam; description of a new species with comments on possible species-groups, C. R. Biologies 334 (2011) 337–341.
- [2] L. Fage, Les Scorpions de l'Indochine française, leurs affinités, leur distribution géographique, Ann. Soc. Entom. France 102 (1933) 25–34.
- [3] L. Fage, Nouvelle contribution à l'étude des Scorpions de l'Indochine française, Bull. Soc. Entom. France 41 (1936) 179–181.
- [4] L. Fage, Scorpions et Pédipalpes de l'Indochine française, Ann. Soc. Entom. France 113 (1946) 71–80.
- [5] F. Kovařík, Revision of family Chaerilidae (Scorpiones), with description of three new species, Serket 7 (2000) 38–77.
- [6] W.R. Lourenço, M.S. Zhu, Description of two new species of *Chaerilus* Simon, 1877 (Scorpiones, Chaerilidae) from Laos and Vietnam, Acta. Zootaxon. Sinica 33 (2008) 462–474.
- [7] W.R. Lourenço, L. Monod, Confirmation de la validité du genre *Hormiops* Fage, 1933 avec redescription d'*Hormiops davidovi* Fage 1933 (Scorpiones, Ischnuridae), Zoosystema 21 (1999) 337–344.
- [8] F. Kovařík, First reports of *Liocheles nigripes* from Indonesia and Malaysia and *Hormiops davidovi* from Malaysia (Scorpiones: Ischnuridae), Acta. Soc. Zool. Bohem. 64 (2000) 57–64.
- [9] A. Davydoff, The life and work of Constantin Davydoff (1877–1960), Ann. Biol. 23 (1964) 37–59 (in French).
- [10] S.I. Fokin, Russkie uchenye v Neapole [Russian scientists in Naples]. St. Petersburg: Aleteia (2006) (in Russian), 380 p. (Constantine Davydoff: pp. 132–133).
- [11] V. Redikorzev, Les Pseudoscorpions de l'Indochine française recueillis par M.C. Dawydoff, Mem. Mus. natl. Hist. nat. Paris 10 (1938) 69–116.
- [12] www.activetravailvietnam.com/nationalparks.
- [13] H.L. Stahnke, Scorpion nomenclature and mensuration, Entom. News 81 (1970) 297–316.
- [14] M. Vachon, Étude des caractères utilisés pour classer les familles et les genres de Scorpions (Arachnides). 1. La trichobothriotaxie en arachnologie. Sigles trichobothriaux et types de trichobothriotaxie chez les Scorpions, Bull. Mus. natl. Hist. nat. 140 (1974) 857–958.
- [15] J.T. Hjelle, Anatomy and morphology, in: G.A. Polis (Ed.), The Biology of Scorpions, Stanford University Press, 1990, pp. 9–63.
- [16] M. Vachon, De l'utilité, en systématique, d'une nomenclature des dents des chélicères chez les Scorpions, Bull. Mus. natl. Hist. nat. 35 (1963) 161–166.