C. R. Biologies 336 (2013) 370–374

Contents lists available at SciVerse ScienceDirect

Comptes Rendus Biologies

www.sciencedirect.com

Biodiversity/Biodiversité

First record of a cave species of *Euscorpiops* Vachon from Viet Nam (Scorpiones, Euscorpiidae, Scorpiopinae)

Wilson R. Lourenço [a,*], Dinh-Sac Pham [b]

[a] *Muséum national d'histoire naturelle, département Systématique et Évolution, UMR 7205, CP 053, 57, rue Cuvier, 75005 Paris, France*
[b] *Institute of Ecology and Biological Resources (IEBR), Viet Nam Academy of Science and Technology (VAST), 18, Hoang Quoc Viet, Cau Giay, Hanoi, Viet Nam*

ARTICLE INFO

Article history:
Received 17 May 2013
Accepted after revision 21 June 2013
Available online 26 July 2013

Keywords:
Scorpion
Euscorpiidae
New species
Cave
Viet Nam

Mots clés:
Scorpion
Euscorpiidae
Nouvelle espèce
Grotte
Viet Nam

ABSTRACT

Euscorpiops cavernicola sp. n., belonging to the family Euscorpiidae Laurie, is described on the basis of two male and two female specimens collected in the Hua Ma cave located in the Quang Khe commune, Ba Be district of Bac Kan province in Viet Nam. The new species presents most features exhibited by scorpions within the genus *Euscorpiops*, however it may represent the first discovered Scorpiopinae species exhibiting certain adaptations to cave life.

RÉSUMÉ

Euscorpiops cavernicola sp. n., appartenant à la famille des Euscorpiidae Laurie, est décrite à partir de deux mâles et deux femelles collectés dans la grotte Hua Ma, laquelle est localisée dans la commune de Quang Khe, district de Ba Be, dans la province de Bac Kan au Viet Nam. La nouvelle espèce présente globalement les caractères qui définissent les scorpions du genre *Euscorpiops* ; cependant, elle pourrait représenter la première espèce de Scorpiopinae, avec des caractéristiques d'adaptation à la vie cavernicole.

1. Introduction

The subfamily Scorpiopinae can be estimated as complex. Scorpiopinae was first proposed by Kraepelin [1] as Scorpiopsinae, a subfamily of Vaejovidae. Lourenço [2] confirmed a previous decision by Stockwell [3] about raising Scorpiopinae to family level. Subsequently, Soleglad & Sissom [4] downgraded Scorpiopidae to a subfamily of Euscorpiidae, and grouped the Asian genera into the tribe Scorpiopini, and also included in this subfamily the North American genus *Troglocormus* (tribe Troglocormini). According to morphological assessments, the subfamily Scorpiopinae currently forms a monophyletic group within Euscorpiidae, and does not share any synapomorphies with North American Vaejovidae [4]. The tribe Scorpiopini includes six Asian genera, mainly from the Southern and Southeastern regions of the continent. This composition is mainly due to Vachon [5] who revised *Scorpiops* and described three new subgenera in addition to the nominotypical subgenus *Scorpiops*; *Alloscorpiops*, *Euscorpiops*, and *Neoscorpiops*. These four subgenera were later elevated to generic rank by Lourenço [2], who added the monotypic genera *Parascorpiops* Banks, 1928, and *Dasyscorpiops* Vachon, 1974, bringing the total number of genera to six. Soleglad & Sissom [4] then supported the validity of *Euscorpiops* based on the position of chela trichobothrium

* Corresponding author.
E-mail address: arachne@mnhn.fr (W.R. Lourenço).

1631-0691/$ – see front matter
http://dx.doi.org/10.1016/j.crvi.2013.06.005

Eb_3 and the presence of an annular ring on the telson. Recently, Lourenço [6] divided the genus *Alloscorpiops* into two subgenera with the creation of the subgenus *Laoscorpiops*. Since most historical aspects around these decisions have been consistently synthesized by Lourenço [6] they will not be further discussed here. In the present note, a new species belonging to the genus *Euscorpiops* is described from Viet Nam.

2. Cave scorpions

Cave scorpions, or more precisely true troglobitic scorpions (i.e. species which complete their entire life cycle within caves) are rare across the World. Vandel [7] stated 'Aucun scorpion ne mène une vie vraiment cavernicole' [no scorpion leads a strictly cavernicolous existence]. It was not until the late 1960s that the first truly troglobitic scorpions were described from Mexican caves [8]: *Typhlochactas rhodesi* Mitchell, 1968 and *Typhlochactas reddelli* Mitchell, 1968. By the mid-1980s the number of troglobite species had increased from 2 to 13 species [9]. Of these, eleven are from Mexico, and belong primarily to the families Diplocentridae Karsch, 1880, Euscorpiidae Laurie, 1896, Typhlochactidae Mitchell, 1971, and Vaejovidae Thorell, 1876. The two non-Mexican species belong to the families Troglotayosicidae Lourenço, 1998 and Chaerilidae Pocock, 1893 and are from Ecuador and Sarawak, respectively. Subsequently, other troglobitic scorpions have been described from Mexico and Sulawesi, most belonging to the families Typhlochactidae and Chaerilidae. More recent descriptions of troglobitic species included some belonging to the family Hormuridae Laurie 1896 from Christmas Island in the Indian Ocean [10] and Madagascar [11], and species within other families, such as the Urodacidae Pocock, 1893, the Buthidae C. L. Koch, 1837 and the Akravidae Levy, 2007 [12–14]. Even more remarkable, however was the discovery of new troglobitic species belonging to the family Pseudochactidae Gromov 1998, from Viet Nam and Laos [15–18].

Species of the family Buthidae are commonly found in caves. In most situations however, these are proved to be only trogloxenes (i.e. species which occasionally penetrate into caves, but complete the majority of their life cycle outside), or troglophilic elements (i.e. species that are regularly found outside caves) [9,19]. Unequivocal troglobitic characteristics have been observed for two buthid species: *Troglotityobuthus gracilis* (Fage, 1946) and *Troglorhopalurus translucidus* Lourenço, Cerqueira Baptista & Giupponi, 2004 [11,13].

Scorpions of the subfamily Scorpiopinae have never been reported inhabiting cave environments. The new species described here represents the first known species of cave-dwelling scorpion belonging to this subfamily and most certainly the first species of this group exhibiting an adaptation to cave life.

3. Methods

Several scorpions were collected by DSP, while exploring the caves with the help of standard electric flashlights. Scorpions were found on the cave walls, approximately 120 m from the main cave entrance. Measurements and illustrations were made using a Wild M5 stereo-microscope with a drawing tube and an ocular micrometer. Measurements follow those of Stahnke [20] and are given in mm. Trichobothrial notations are those developed by Vachon [5,21] and the morphological terminology follows that of Hjelle [22].

4. Taxonomic treatment

Family: EUSCORPIIDAE Laurie, 1896.
Subfamily: SCORPIOPINAE Kraepelin, 1905.
Genus: ***Euscorpiops*** Vachon, 1980.
Euscorpiops cavernicola sp. n. (Figs. 1–3).

Viet Nam, Bac Kan province, Ba Be district, Quang Khe commune, Hua Ma cave (22°22′20.52″N–105°42′02.36″E), 12/VIII/2011 (Pham Dinh-Sac). Male holotype and one female paratype were deposited in the Muséum national d'histoire naturelle, Paris. Two paratypes, one male and one female, were deposited in the Viet Nam Academy of Science and Technology (VAST), Hanoi.

Etymology: The specific name refers to the cave environment where the new species was found.

Diagnosis: The new species exhibits the general characteristics defined for species within the genus *Euscorpiops* [4,5]. Total body length medium to small when compared to other species within the genus. Maximum total length observed for adults, males and females 42 and 43 mm respectively. Body and pedipalps moderately slender. Internal aspect of patella with two very strong spinoid tubercles; the interno-ventral being larger than the interno-dorsal tubercle. Trichobothrial pattern with three trichobothria on femur: dorsal, internal and external. Patella with two dorsal trichobothria, one internal, 11 ventral and 17 external trichobothria on males and 15 to 17 on females. Chela-manus with four ventral, two dorsal (*Dt*, *Db*), two internal (*ib*, *it*), one *Est*, five *Et*, one *Esb* and three trichobothria in the *Eb* series. Trichobothrium EB_3 is distal in relation to Eb_2 [21].

Ecological notes: Hua Ma cave is located in Quang Khe commune in Ba Be district. This cave was only recently discovered, and remains almost completely preserved and remains poorly prospected. The Hua Ma cave has been naturally shaped during the several-million-years process of geological changes. It is 700 m in length and in some places opening is very impressive reaching up to 50 m in height. Inside the cave, there are thousands of stalagmites and stalactites. Scorpions were located with the help of standard electric flashlights and were found about 120 m from the main entrance, on the walls of the cave. Scorpions do not show, however, major signs of a full adaptation to cave life.

Description: Coloration reddish-yellow to reddish-brown. Carapace reddish with paler zones on furrows. Tergites reddish-yellow. Metasomal segments reddish-brown; telson yellow to reddish-yellow; base of aculeus yellow and tip reddish. Chelicerae yellow with dark variegated spots. Pedipalps reddish-brown; extremities of fingers slightly paler. Legs yellow to reddish-yellow. Venter reddish-yellow; genital operculum, pectines and sternites yellow without infuscations.