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One more new genus and species of scorpion from Early Cretaceous Burmese amber (Scorpiones: Protoischnuridae)

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new genus; Myanmar.
new species;
Cretaceousopisthacanthus;

Abstract. – Scorpions can still be considered rare among the arthropods found trapped in amber; however, in the last twenty years the number of new described taxa knew a remarkable increase. Early Cretaceous Burmese amber, also known as Burmite, brought the major contribution to the knowledge of these amber fossils. In the present contribution one new genera and species are described bringing further confirmation to the validity of the family Protoischnuridae Carvalho & Lourenço, 2001. The discovery of this new scorpion group in Burmite attests to the considerable degree of diversity in these amber-producing forests.

Lourenço W. R. & Velten J., 2021. – One more new genus and species of scorpion from Early Cretaceous Burmese amber (Scorpiones: Protoischnuridae). *Faunitaxys*, 9(14): 1 – 5.

ZooBank: <http://zoobank.org/BCDC4212-B213-4FC3-BD0E-ED8E815D082C>

Introduction

As already outlined in several previous papers (Lourenço, 2016a,b, 2018a,b,c; Lourenço & Velten, 2019, 2020), scorpions included in amber can in general be considered as rare. Nevertheless, during the last 25 years an increasing number of amber pieces containing scorpions have become available for study. Synopsis of these scorpion taxa recently described from amber were provided by Lourenço (2009, 2016a).

The most conspicuous improvement in the number of new taxa concerned the specimens found in Early Cretaceous Burmese amber mainly due to the increasing commercial availability of this amber during the last 20 years. The majority of the new genera and species described belong to two families Palaeoburmesebuthidae Lourenço, 2015 and Chaerilobuthidae Lourenço & Beigel, 2011. Most of these described taxa were associated with buthoids, such as the genera *Palaeoburmesebuthus* Lourenço, 2002 *Betaburmesebuthus* Lourenço, 2015 and *Spinoburmesebuthus* Lourenço, 2017 (family Palaeoburmesebuthidae) however, one genus, *Archaeoananteroides* Lourenço 2016 was clearly accommodated in the family Buthidae C. L. Koch, 1837 (Lourenço & Velten, 2016). A number of non buthoid elements have also been recorded and described, namely: *Electrochaerilus buckleyi* Santiago-Blay, Fet, Soleglad & Anderson, 2004 (family Chaerilidae Pocock, 1893), several species of the genus *Chaerilobuthus* Lourenço & Beigel, 2011 and *Chaeriloiurus brigittemuelleriae* Lourenço, 2020 (family Chaerilobuthidae), *Palaeotrilineatus ellenbergeri* Lourenço, 2012 (family Palaeotrilineatidae Lourenço, 2012), *Archaeoscorpions cretacicus* Lourenço, 2015, *Burmesescorpions groehni* Lourenço, 2016 and *Chaeriloscorpions bautschi* Lourenço, 2020 (subfamily Archaeoscorpioninae Lourenço, 2015: family Palaeoescorpiidae Lourenço, 2003), *Sucinlourencous adrianae* Rossi, 2015 (family Sucinlourencoidae Rossi, 2015). For a synthesis see Lourenço (2018a) and Lourenço & Velten (2020). Most remarkable was the description of *Cretaceoushormiops knodeli* Lourenço, 2018, new genus and species accommodated in the family Protoischnuridae Carvalho et Lourenço, 2001, family originally based on a

sedimentary fossil described from Santana Formation in the Crato Area, Lower Cretaceous of Brazil (Carvalho & Lourenço, 2001). It is important to recall that this Cretaceous family was arbitrarily placed in the synonymy of the extant family Hemiscorpiidae Pocock, 1893 (now Hormuridae Laurie, 1896) by Menon (2007), and that the discovery and description of the genus *Cretaceoushormiops* Lourenço, 2018 authorised its revalidation. For precise details on these taxonomic changes refer to Lourenço (2018a).

The study of one new Burmese amber piece containing one remarkable scorpion, leads to the description of one new genus and species. More significantly, however, are the taxonomic elements furnished by this specimen allowing a further confirmation of the validity of family Protoischnuridae. The description of this new Burmite element further attests to the considerable faunal diversity in the Burmese amber-producing forests.

Material and methods

The specimen investigated is originally preserved in a rather clear oval-shaped block of pale yellow amber. Details of the piece are provided with the description. Many characters, and in particular trichobothria, are particularly well visible in the specimen, allowing detailed investigation. Nevertheless, some characters can be more difficult to be interpreted because the specimen suffered a certain degree of desiccation (mummification) process within the resin and besides it was probably dismembered previously to be catch in the resin. A situation already observed with other Burmite specimens. The presence of quite many bubbles and inclusions such as vegetal remains or even detritus equally prevents a fully observation of some characters. The schematic drawings provided here are interpretations of what was observable. Illustrations and measurements were produced with the aid of a Wild M5 stereomicroscope equipped with a drawing tube and an ocular micrometer. Measurements follow Stahnke (1970) and are given in

mm, and morphological terminology mostly follows Hjelle (1990). Trichobothrial notations follow Vachon (1974). Trichobothria were definitely recorded only when their bothria (areoles) could be observed. Other trichobothria may be suggested by the presence of transverse hairs.

Systematic treatment

Family **Protoischnuridae** Carvalho & Lourenço, 2001

Genus ***Cretaceousopisthacanthus*** Lourenço **gen. n.**

ZooBank: <http://zoobank.org/1FC6ED3F-83D8-49B5-B7C3-308F2AB929C2>

Diagnosis for the new genus. – Total length 22.97 mm. General coloration reddish-brown to brownish. Carapace with a strongly marked median concavity; median ocular tubercle only slightly anterior to the centre of the carapace; three lateral eyes can be observed; a possible fourth pair of vestigial eyes may exist (Fig. 1). Sternum destroyed therefore not observable. Pectines; only the left one is observable; moderate to large in size with 10 teeth; fulcra present and conspicuous (Fig. 2-15). Spiracles are oval to slit-like in shape (Fig. 2). Metasomal segment rounded and weakly flattened dorsally with only dorsal and latero-dorsal carinae observable. Telson with a long globular vesicle not flattened laterally; no annular ring on the telson is observed (Fig. 3-14). The general morphology of the pedipalps is similar to that of some extant Hormuridae, in particular that of the genera *Cheloctonus* Pocock, 1892 and *Opisthacanthus* Peters, 1861; the fixed and movable fingers of pedipalps present however two distinct rows of small rounded granules, without clear accessory granules, what further associates this new genus to *Opisthacanthus* (Fig. 10-16); each finger terminating by a conspicuous spinoid process. Chelicerae only partially observed but showing a dentition similar to that defined for the Scorpionidae (Fig. 4) sensu Vachon (1963). Tibial spurs absent; tarsi with two rows of spinoid setae (2-3 external, 2 internal) what again associates the new genus to *Opisthacanthus* (Fig. 5) Trichobothrial pattern similar to type C defined by Vachon (1974) and also illustrated by Lourenço (1987) for the genus *Opisthacanthus*. On the chela hand, trichobothria **Db**, **Dt**, **Est**, **Et₁₋₅**, **Esb**, **Eb₁** to **Eb₃** and 4 **V** can be observed. On the chela fixed finger, trichobothria **eb**, **db**, **dsb**, **esb**, **dst**, **dt**, **est**, **et** and **ib**, **it** can be observed. Patella shows **d₁** and **d₂** on dorsal face; **i** on internal face; on the ventral face 3 **V** trichobothria are observed. 6-7 external trichobothria can be directly observed on the patella, but the presence of several transverse hairs suggest a higher number reaching a total of 11-12, which belong to territories **et**, **est**, **esb** and **eb**. Femur shows one **d**, one **i** and one **e** (Fig. 6-9).

Etymology. – Generic name refers to the association of Cretaceous horizon and the extant genus *Opisthacanthus*.

Type species. – *Cretaceousopisthacanthus smeelei* Lourenço **sp. n.**

Cretaceousopisthacanthus smeelei Lourenço **sp. n.**

(Fig. 1-10, 13-16)

ZooBank: <http://zoobank.org/AE835166-D9EC-4F0B-80BE-CA2214FB9FC5>

Holotype: A possible pre-adult. Sex cannot be determined with a total certitude, but according to the morphology of chelae, pectines and telson it is most certainly a male. The holotype is included in an oval-shaped block of clear yellow amber that measured 35 x 26 x 4-5 mm. The amber contains quite many remains of plants and other organic inclusions but equally two orthopteran crickets.

Type locality and horizon. – Myanmar (Burma), Kachin; precise locality unknown, as for most Burmite pieces. Lower Cretaceous.

Etymology. – Name honours Doctor Ben P. J. Smeele, Amsterdam, Nederland, who supported the study of the amber specimen.

Depository. – The type specimen is deposited in the Collection of Doctor Ben P. J. Smeele, Amsterdam, Nederland.

Description

Coloration. – The scorpion is reddish-brown to brownish; carapace and tergites reddish-brown, with carapace slightly darker; metasomal segments brownish; segment V and telson darker; pedipalps and legs reddish-brown. The ventral aspect of the specimen is brownish.

Morphologie. – Carapace with few granulations, but not really smooth; anterior margin with a strongly marked median concavity. Carinae weakly marked to absent; furrows moderate to strong. Median ocular tubercle slightly anterior to the centre of carapace; median eyes large in size and separated by less than one ocular diameter. Three pairs of lateral eyes, better observed in the left side of the carapace; a possible fourth pair of vestigial eyes may exist. Sternum damaged, therefore not observable. Mesosomal tergites with moderate granulations and one median weak carina; VII with five weak carinae. Pectines; only the left one is observable; moderate to large in size with 10 teeth; fulcra present and conspicuous. Sternites with minute granulations, almost smooth; spiracles oval to slit-like in shape. Metasomal segment rounded and weakly flattened dorsally with only dorsal and latero-dorsal carinae observable; dorsal carinae of segments IV and V without any spinoid granules; dorsal aspect of segment V weakly depressed; anal arc with 10-12 spinoid granules; setation on all segments weakly marked. Telson with a long globular vesicle not flattened laterally; not granular, smooth; aculeus shorter than the vesicle and moderately curved; absence of any annular ring on the telson. Cheliceral dentition partially visible, similar to that defined for the Scorpionidae sensu Vachon (1963). Pedipalp femur pentacarinat with some strong internal spinoid granules; patella with dorso-internal, ventro-internal, and dorso-external carinae; internal face without spinoid granules and with one moderate to weak apophysis. Chela large and flattened with weakly marked carinae; all faces with few granulations, almost smooth. Fixed and movable fingers each with two rows of small rounded granules; no accessory granules are observable; each finger terminating by a conspicuous spinoid process; setation of pedipalps weak to moderate. Tibial spurs absent; tarsi with two rows of spinoid setae, 2-3 external and 2 internal. Trichobothriotaxy similar to type C (Vachon, 1974) of extant Hormuridae of the genus *Opisthacanthus* (Lourenço, 1987) and most probably orthobothriotaxic. For details refer to the diagnosis of new genus.

Morphometric values (mm), holotype of *Cretaceousopisthacanthus smeelei* Lourenço **sp. n.**

– **Total length:** 22.97 (including telson).

– **Carapace:** length 3.12, anterior width 2.14, posterior width 3.24.

– **Mesosoma:** length 6.35.

– **Metasomal segments**

I: length 1.34, depth 0.87;

II: length 1.61, depth 0.87;

III: length 2.00, depth 0.87;

IV: length 2.14, depth 0.94;

V: length 3.54, depth 0.94.

– **Telson:** length 2.87.

– **Vesicle:** depth 1.27.

– **Pedipalp**

femur length 1.87, width 1.14;

patella length 3.10, width 1.27;

chela length 5.34, width 2.67, depth?.

– **Movable finger:** length 2.27.

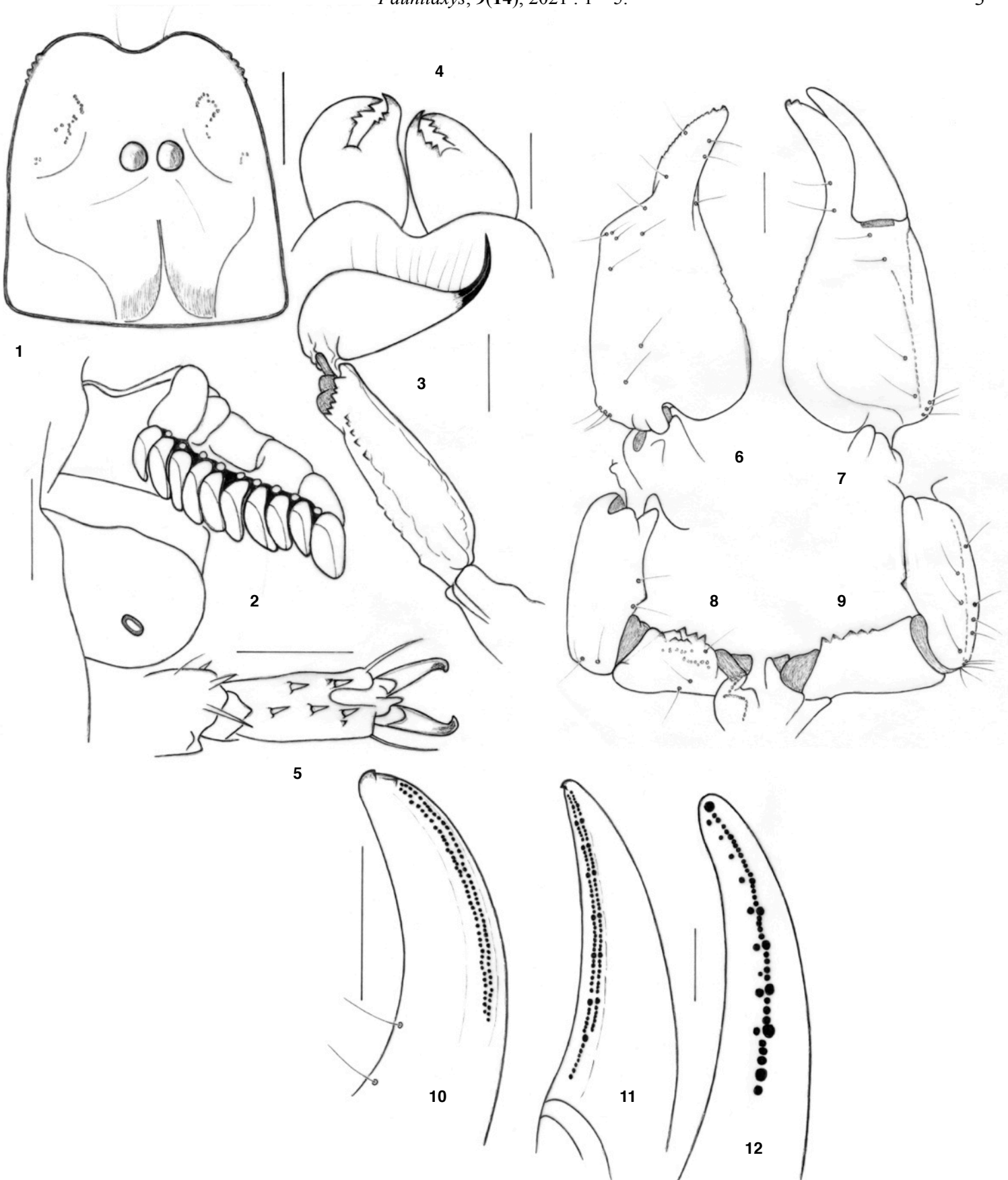


Fig. 1-9. *Cretaceousopisthacanthus smeelei* Lourenço **sp. n.**

1) Carapace dorsal aspect. 2) Left pecten and sternite showing spiracle. 3) Metasomal segment V and telson, lateral aspect. 4) Chelicerae, dorsal aspect. 5) Tarsi of leg II. 6-9) Trichobothrial pattern: 6-7) Chela dorso-external and ventral aspects; 8-9) Patella and femur dorsal and ventral aspects.

Fig. 10-12. Comparative fingers showing a distinct disposition of granules.

10) *Cretaceousopisthacanthus smeelei* Lourenço **sp. n.** 11) *Opisthacanthus africanus* Simon, 1876. 12) *Cheloctonus jonesii* Pocock, 1892.

Scale bars = 1 mm, excepted for 5 = 0.5 mm.

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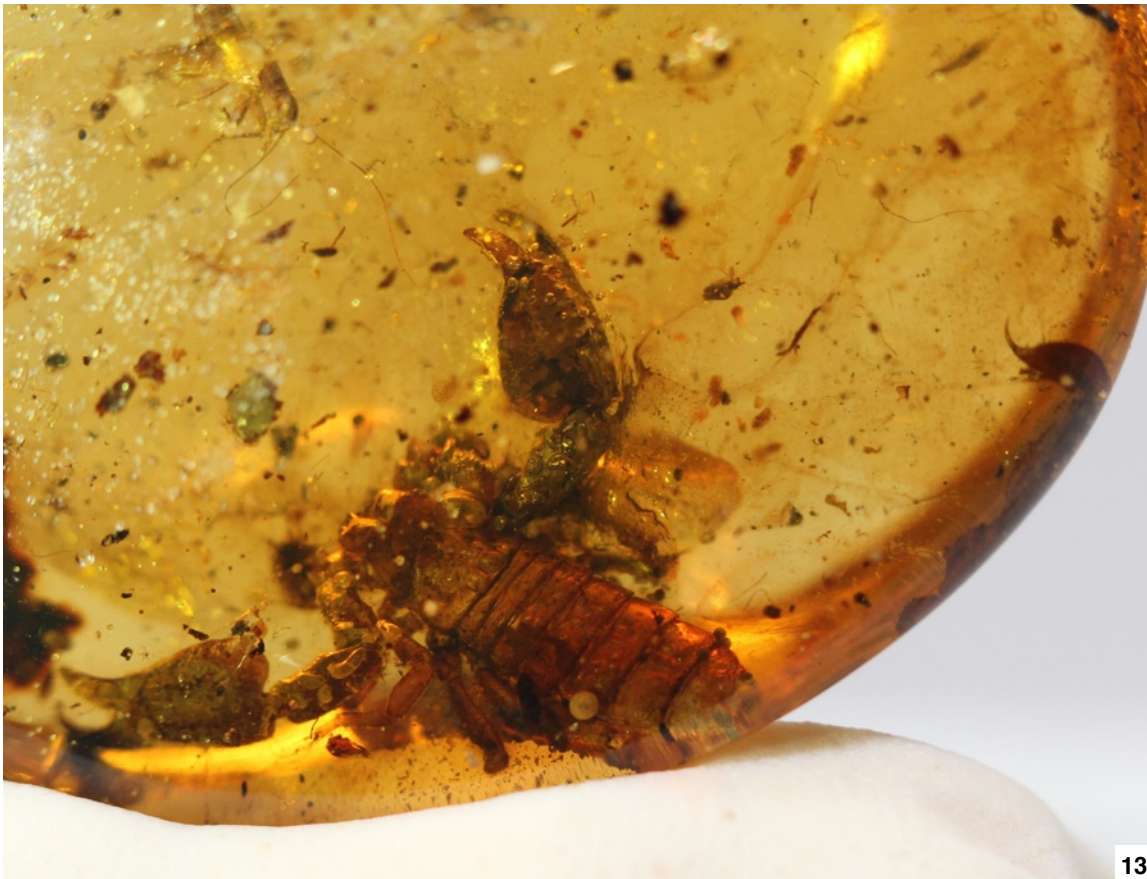
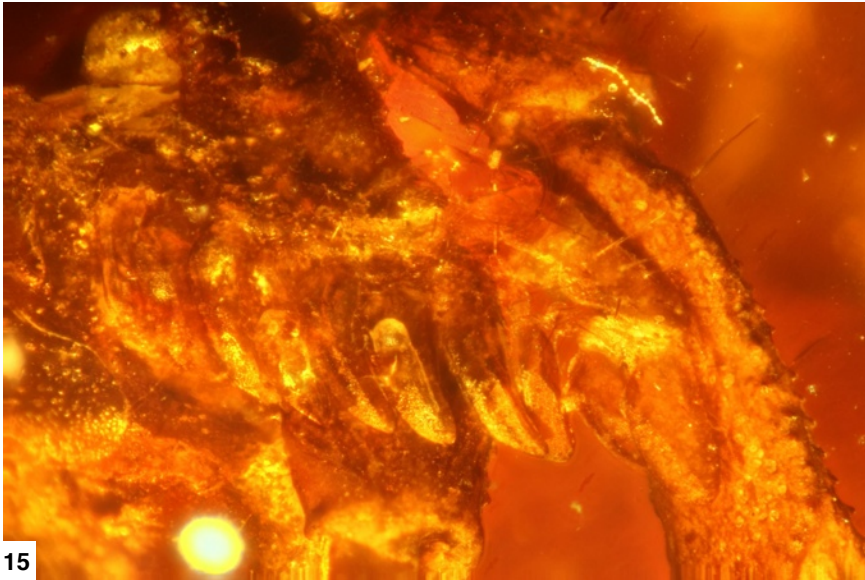
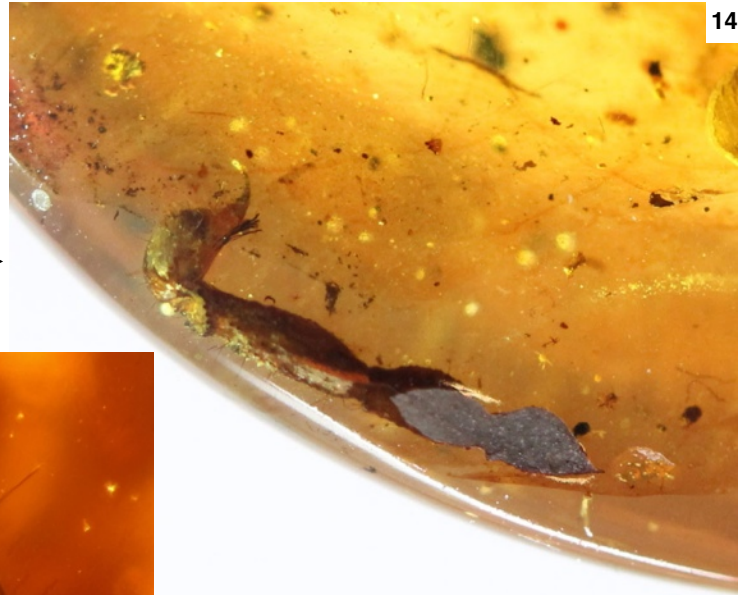


Fig. 13. *Cretaceousopisthacanthus smeelei* Lourenço sp. n., habitus, dorsal aspect.

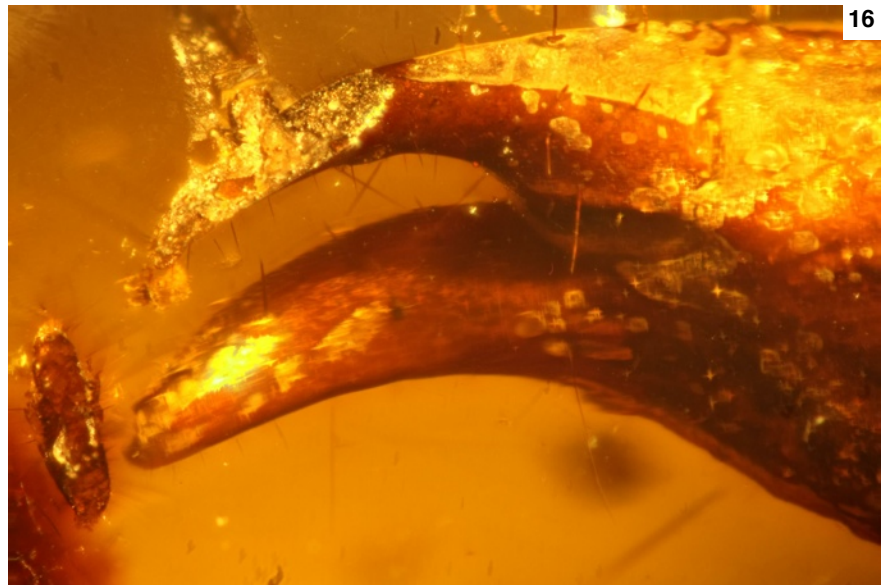
Fig. 14-16. *Cretaceousopisthacanthus smeelei* Lourenço **sp. n.**

14) Metasomal segments III-V and telson, lateral aspect. Segments I and II are suggested by their print in the resin. →



15) Left pecten in detail. ←

16) Left chela, ventral aspect. Granulations on fixed finger can be observed. →



Résumé

Lourenço W. R. & Velten J., 2021. – Un nouveau genre et une nouvelle espèce de scorpion de l'ambre du Crétacé inférieur de la Birmanie (Scorpiones : Protoischnuridae). *Faunitaxys*, 9(14) : 1 – 5.

Les scorpions peuvent encore être considérés comme rares parmi les arthropodes trouvés dans l'ambre, cependant au cours des vingt dernières années le nombre de taxons décrits a connu une croissance remarquable. L'ambre du Crétacé inférieur de la Birmanie, aussi connu comme Burmite, est celui qui a le plus contribué à la connaissance de ces fossiles dans l'ambre. Dans la présente étude un nouveau genre et une nouvelle espèce sont décrits apportant une nouvelle preuve de la validité de la famille des Protoischnuridae Carvalho & Lourenço, 2001. La découverte de ce nouveau groupe de scorpions dans l'ambre Birman conforte la très grande diversité qui a pu exister au sein de ces forêts productrices d'ambre.

Mots-clés. – Scorpiones, Protoischnuridae, fossile, nouveau genre, nouvelle espèce, *Cretaceousopisthacanthus*, *smeelei*, Crétacé, Ambre Birman, Birmanie.

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Illustration de la couverture : *Cretaceousopisthacanthus smeelei* Lourenço **gen. n., sp. n.** dans l'ambre du Crétacé inférieur de la Birmanie.

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