

The genus *Hemiscorpius* Peters, 1861 (Scorpiones: Hemiscorpidae) in East Africa, and description of a new species from Somalia

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(with 15 figures)

Abstract

New considerations are proposed about the species of *Hemiscorpius* Peters, 1861 reported from East Africa. *Hemiscorpius tellinii* Borelli, 1904 is accepted as a valid species, distinct from *Hemiscorpius socotranus* Pocock, 1899. This last species most certainly represents an endemic element to the Island of Socotra and its presence in Somalia requires further investigation. One new species, *Hemiscorpius somalicus* sp. n., is described from the region of Meleden in northeast Somalia. The total number of species in the genus *Hemiscorpius* is now raised to 12.

Key words: Scorpiones, *Hemiscorpius*, new species, Island of Socotra, Somalia.

Introduction

Scorpions of the family Hemiscorpidae Pocock, 1893 have been the subject of few studies, aside from the original descriptions. Two recent noticeable exceptions are the publications of Monod and Lourenço (2005) and Lowe (2010). These, however, focused mainly on the Middle East species, in particular those from Iran and Oman.

Only one species of *Hemiscorpius*, *H. tellinii* Borelli, 1904, was originally described from East Africa. The original description was based on a single female specimen collected at Halibaret in Eritrea (Borelli, 1904). This species was retained as valid by Fet (2000) and, its status was confirmed by Lowe (2010) who studied the original type specimen, and clearly presented diagnostic characters in a key. Kovařík (2003) suggested that this species should be regarded as dubious, but without any justification. The type specimen of *H. tellinii* is permanently deposited in the Museo Regionale di Scienze Naturali di Torino. It was not possible, however, to loan the specimen for examination since it is poorly preserved. Mr. Alberto Chiarli, curator in charge of Arachnida at the MRSNT, was, however, very kind and send me several photos of the type specimen. Moreover, Dr. Graeme Lowe from Philadelphia, kindly shared with me several schematic drawings of the type of *H. tellinii*. These documents help me to conclude about the validity of this species.

Other records of *Hemiscorpius* species in Africa are the one of Caporiacco (1937) who indicated 5 females of *H. socotranus* Pocock, 1899 from Bender Cassim in Somalia, and those of Moriggi (1941) who equally indicates *H. socotranus* from Bender Cassim, but also *H. tellinii* from El Alberet

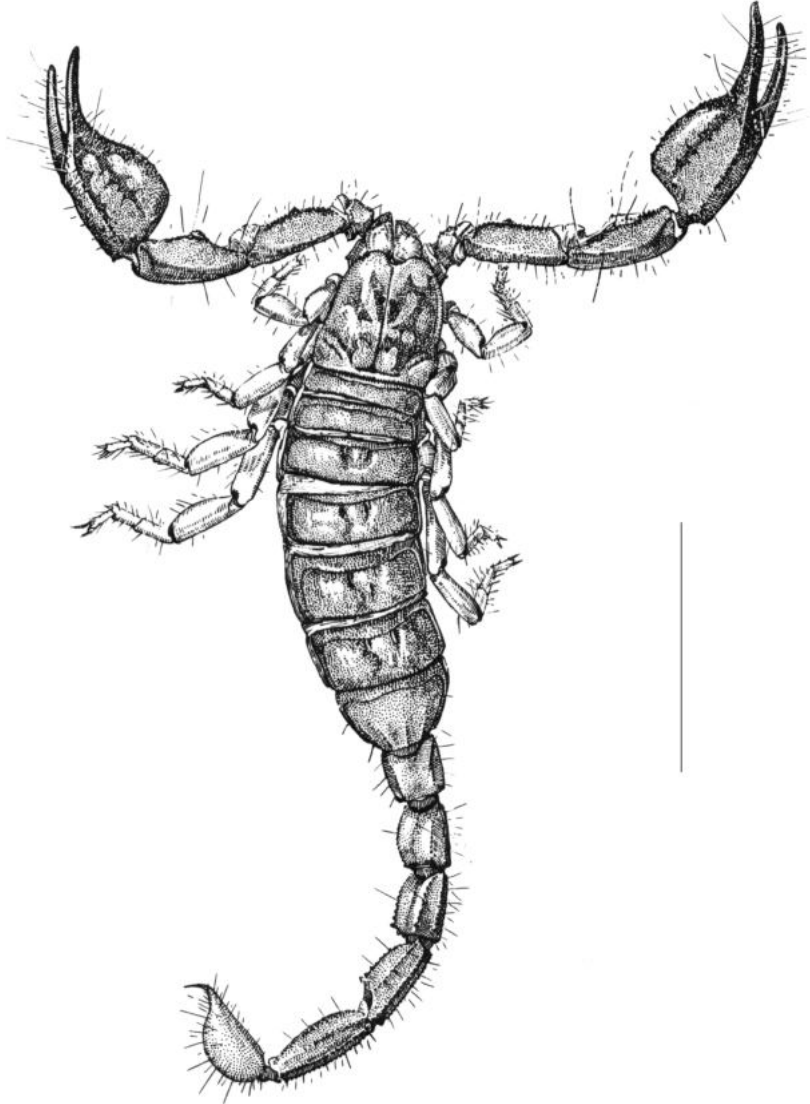


Fig. 1. *Hemiscorpius socotranus* Pocock: habitus, female from Socotra Island (scale bar: 10 mm).

in Eritrea (Lamoral & Reynders 1975). According to Lowe (*in litt.*), El Alberet cited by Moriggi (1941) is in fact only a different spelling for Halibaret, the type locality of *H. tellinii* in Eritrea (Borelli 1904). None of these specimens have been examined in the present study. Kovařík (2003) lists one specimen determined by Caporiacco in 1947 as *H. socotranus*. Pocock (1899) described *H. socotranus* from the Island of Socotra, and most certainly, this species represents an endemic element to this island. Since neither Caporiacco (1937) nor Kovařík (2003) compared the Somalian specimens to those of Socotra, I suggest that the confirmation of this species in Somalia will require new collections of fresh material and further investigation about its status.

A new species of *Hemiscorpius* is described in this paper. It was collected by my late colleague and friend, P. M. Brignoli in the area of Meleden in Somalia. Since Meleden is located in the same region of Bender Cassim, and actually not too far from the coastal region facing Socotra Island, I decided to compare it to *H. socotranus* and to *H. tellinii*. A revised diagnosis is also proposed for *H. socotranus*, based on specimens deposited in the Muséum national d'Histoire naturelle in Paris (MNHN) and in the Zoologisches Museum Hamburg (ZMH). It is impossible, however, in the present state of our knowledge, to suggest that the material listed by Caporiacco (1937) and Moriggi (1941) could eventually be referred to this new species.

Methods

Illustrations and measurements were produced with the aid of a Wild M5 stereomicroscope with a drawing tube (camera lucida) and an ocular micrometer. Measurements follow Stahnke (1970) and are given in mm. Trichobothrial notations follow Vachon (1974) and morphological terminology mostly follows Hjelle (1990).

Taxonomic treatment

Family Hemiscorpiidae Pocock, 1893

Genus *Hemiscorpius* Peters, 1861

Hemiscorpius socotranus Pocock, 1899

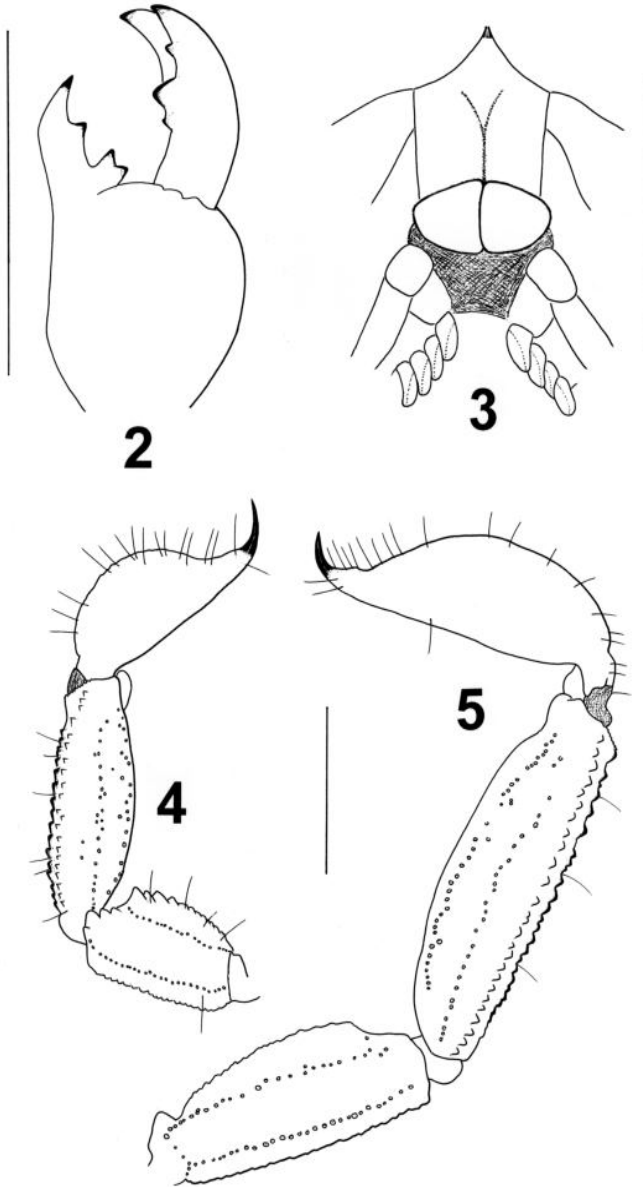
(Figs 1, 5, 14)

Hemiscorpius socotranus Pocock, 1903: 181; Birula 1917: 215, 231; Caporiacco 1937: 362 (?); Moriggi 1941: 93 (?); El-Hennawy 1992: 99, 135; Kovařík 1998: 136; Fet 2000: 430; Kovařík 2002: 14; Kovařík 2003: 149 (?); Kovařík & Whitman 2004: 115 (?); Monod & Lourenço 2005: 870, 872-874, 936, fig. 38; Lowe 2010: 21-23 (?). [? = possible misidentification].

Hemiscorpion socotranus Roewer, 1943: 226; Probst 1973: 329; Lamoral & Reynders 1975: 543; Francke 1977: 112; Vachon 1979: 237.

MATERIAL EXAMINED: Socotra Island, Wadi Dajuj, 24 April 1967, 2500-2800 m a.s.l., coll. K. M. Guichard (2 ♂, 8 ♀: MNHN-RS-4674, 4675, 4676, 4677, 4678).

Socotra Island, Wadi Dajuj, March 1981, coll. P.M. Brignoli (2 ♀: ZMH).



Figs 2-5. *Hemiscorpius somalicus* sp. n. (2-4) Male holotype: **2.** chelicera, dorsal aspect; **3.** ventral aspect, showing sternum, the shape of the genital operculum plates and part of pectines; **4.** metasomal segments IV-V and telson, lateral aspect; **5.** *H. socotranus*, idem, male from Socotra Island. (Scale bars Fig. 2 = 1 mm; Figs 3-5 = 2 mm).

REVISED DIAGNOSIS: Coloration basically yellowish-brown with some brownish zones on carapace, tergites, chela fingers and metasomal segments; these are better marked on females. Metasomal segments and chela fingers darker than prosoma and mesosoma; vesicle yellowish; aculeus dark reddish on the tip. Chelicerae yellowish, including fingers; teeth reddish; dorsal surface with vestigial variegated spots. Pedipalps yellowish with reddish carinae. Venter with sternites, pectines and genital operculum pale yellow. Legs yellowish.

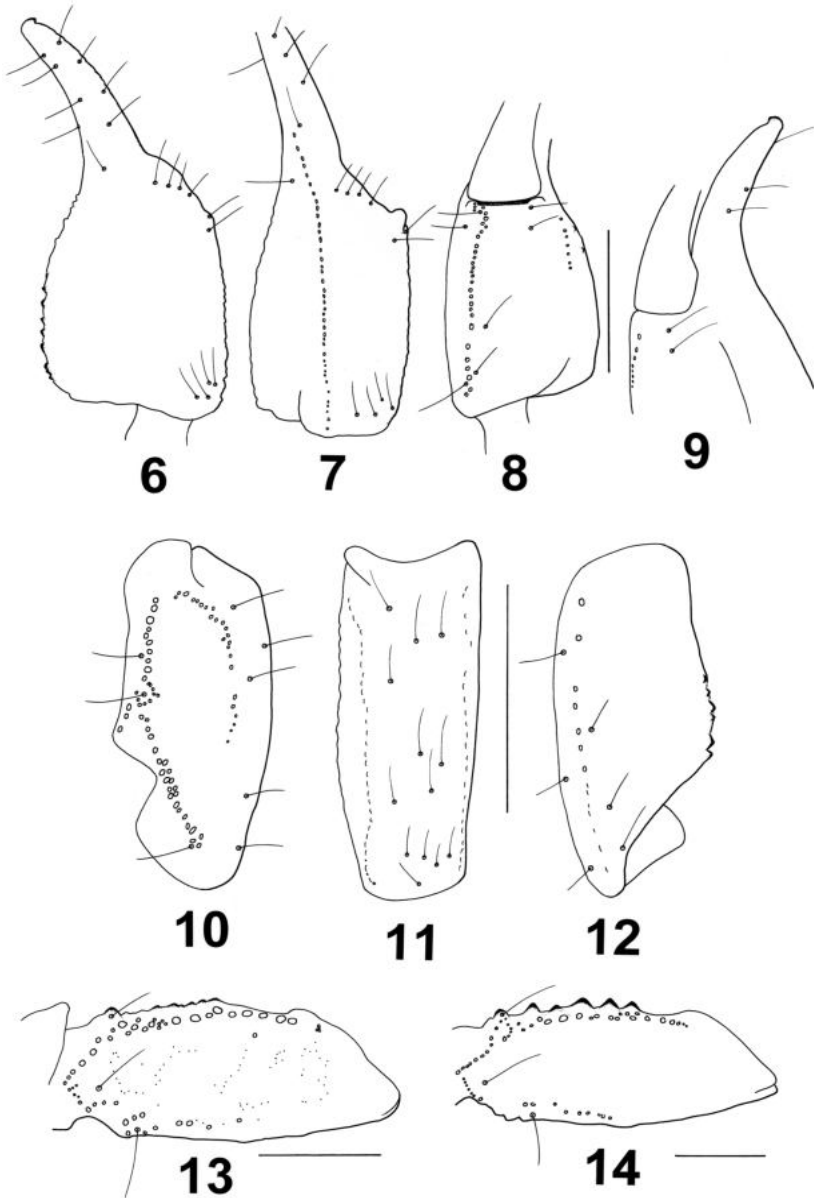
MORPHOLOGY. Medium size scorpions: males and females 32 to 35 mm in total length. Male differing from female in its more slender build, with a longer metasoma. Morphometric ratios (L/W) for metasomal segments are as follows: Male: I, $2.6/1.9 = 1.37$; II, $2.8/1.8 = 1.55$; III, $3.0/1.7 = 1.76$; IV, $3.6/1.6 = 2.25$; V, $4.9/1.4 = 3.50$. Female: I, $2.4/2.5 = 0.96$; II, $2.6/2.2 = 1.18$; III, $2.9/2.0 = 1.45$; IV, $3.5/1.9 = 1.84$; V, $4.6/1.7 = 2.70$. Telson vesicle elongated on male, bulbous on female. Body and appendages almost smooth, with fine punctuations. Carapace smooth with punctuations; anterior margin with a strong concavity reaching as far as the level between the 2nd and 3rd lateral eyes. Sternum wider than long in male and female. Genital operculum formed by two oval plates in males, and one single heart-like shaped plate in females. Sternites smooth lustrous, with small oval-shaped spiracles. Pectinal tooth count 12 to 13 in males and 8 to 10 in females. Metasomal carinae moderately to strongly developed; ventral vestigial or absent on segments I-III; dorsal with some minute posterior spinoid granules on segments I-IV. Pedipalp carinae moderately developed; patella with dorsoexternal carinae weakly developed on male, moderate on female; internal apophysis weakly developed with 3 granules; internal aspect of femur with strongly developed spinoid granules. Chela with an inconspicuous scalloping of the proximal dentate margin of fixed finger in female; fingers with a double row of denticles fused at the proximal 1/3; presence of minute inner accessory granules. Trichobothriotaxy type C; orthobothriotaxic (Vachon 1974). Legs: tarsi with 2 rows of 5-6 spiniform setae. Venom glands simple, not folded as in some Middle East species (Lourenço 1989). Hemispermaphore unknown.

Hemiscorpius somalicus sp. n.
(Figs 2-4, 6-13)

TYPE MATERIAL: Holotype ♂: Somalia, 5 km E of Meleden, road to Scusciuban, April 1982, coll. P.M. Brignoli (ZMH Acc. No. A18/11).

ETYMOLOGY: Specific name refers to the country where the new species was found.

DIAGNOSIS: Coloration reddish-yellow to reddish-brown, with some dark variegated zones on carapace and tergites. Small size scorpion: male 22 mm in total length. Body and metasoma weakly elongated. Morphometric ratios (L/W) for metasomal segments are as follows: I, $1.5/1.6 = 0.94$; II, $1.7/1.5 = 1.14$; III, $2.0/1.4 = 1.43$; IV, $2.2/1.3 = 1.69$; V, $3.2/1.1 = 2.91$. Telson vesicle bulbous not elongated. Tegument of body and appendages without granulations, smooth and with some punctuations. Metasomal carinae moderately



Figs 6-14. *Hemiscorpius somalicus* sp. n. Male holotype (6-14). Trichobothrial pattern: **6-9.** chela, dorso-external, external, ventral and internal aspects; **10-12.** patella, dorsal, external and ventral aspects; **13.** femur, dorsal aspect; **14.** idem for *H. socotranus*, male from Socotra Island. (Scale bars: Figs 6-12 = 2 mm; Figs 13-14 = 1 mm).

to strongly developed; ventral vestigial on segments I-II; dorsal with strong posterior spinoid granules on segments I-IV. Pedipalp carinae moderately developed; patella with dorsoexternal carinae weakly developed; internal apophysis weakly developed with 5 granules; internal aspect of femur with some weak spinoid granules. Chela without any scalloping of the proximal dentate margin of fixed finger; fingers with a double row of denticles fused at the proximal 1/2; inner accessory granules inconspicuous. Pectines with 13-13 teeth in male. Trichobothrial pattern of type C, orthobothriotaxy. Leg tarsi with two rows of 3-4 spiniform setae. Hemispermaphore unknown.

DESCRIPTION based on male holotype. Measurements in Table 1.

Table 1. Measurements (in mm) of male and female of *Hemiscorpius socotranus* from Socotra Island and the male holotype of *Hemiscorpius somalicus* sp. n.

	<i>H. socotranus</i>		<i>H. somalicus</i> sp. n.
	♂	♀	♂
Total length*	32.2	32.1	22.3
Carapace:			
- length	4.1	5.2	3.6
- anterior width	2.4	3.1	2.4
- posterior width	3.8	4.7	3.6
Metasomal segment I:			
- length	2.6	2.4	1.5
- width	1.9	2.5	1.6
Metasomal segment V:			
- length	4.9	4.6	3.2
- width	1.4	1.7	1.1
- depth	1.3	1.7	1.1
Vesicle:			
- width	1.5	1.8	1.2
- depth	1.4	1.9	1.2
Pedipalp femur:			
- length	3.6	4.1	2.9
- width	1.4	1.7	1.3
Pedipalp patella:			
- length	3.8	4.5	3.1
- width	1.6	1.8	1.3
Pedipalp chela:			
- length	6.9	8.2	5.8
- width	2.5	3.2	2.0
- depth	1.8	2.3	1.5
Pedipalp movable finger:			
- length	3.7	4.4	3.0

*Excluding telson length.

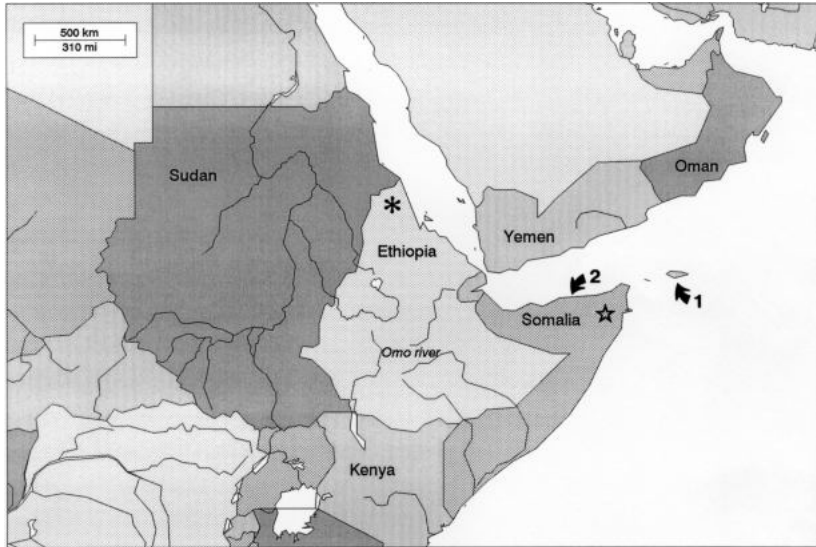


Fig. 15. The type localities and records in East Africa for the treated *Hemiscorpius* species. Island of Socotra, type locality of *H. socotranus* (1), Bender Cassim in Somalia (2). Halibaret in Eritrea, type locality of *H. tellinii* (black flower); region of Meleden in Somalia, the type locality of *H. somalicus* sp. n. (white star).

COLORATION. Basically reddish-yellow to reddish-brown with some dark variegated zones on the carapace and tergites. Carapace reddish with dark variegated spots; median and lateral eyes surrounded with black pigment. Tergites reddish with vestigial dark variegated spots. Metasomal segments reddish-yellow; carinae darkly marked; vesicle yellowish; aculeus reddish. Chelicerae reddish-yellow; dorsal surface with diffuse brownish variegated spots; fingers reddish-yellow with reddish teeth. Pedipalps reddish-yellow to reddish; most carinae dark to blackish. Venter and sternites yellowish to reddish-yellow; pectines paler than sternites, sternum and coxapophysis; legs yellowish with some carinae reddish.

MORPHOLOGY. Carapace without granulations, with some minute punctuations, smooth; furrows shallow. Anterior margin with a strong concavity reaching as far as the level of the 2nd lateral eye. Median ocular tubercle flattened and slightly anterior to the centre of the carapace; median eyes moderate, separated by less than one ocular diameter; three pairs of large lateral eyes. Sternum pentagonal, longer than wide. Genital operculum narrow formed by two oval plates. Tergites with only a vestigial median carina, smooth and with some minute punctuations. Pectinal tooth count 13-13 in male holotype. Sternites smooth and shiny; VII acarinate with a few punctuations; sternite III without any granulated or shagreened cuticular zone above the pectines. Metasomal segment I wider than long; II to V longer than wide

(cf morphometric ratios in diagnosis), tegument without granulations. All carinae moderately to strongly marked in segments I to V; ventral vestigial on segments I-II; dorsal on segments I-IV with strong posterior spinoid granules; segment V with five carinae; ventral with spinoid granules. All segments with moderate to weak chaetotaxy. Telson bulbous, not elongated, smooth and covered with moderate chaetotaxy. Pedipalps: femur with dorsal internal, dorsal external and ventral internal carinae moderate; all faces without granulations; internal face with some weak spinoid granules. Patella without granulations on all faces, smooth and lustrous; dorsal internal and ventral internal carinae moderate; ventral external and external carinae weak to vestigial; internal apophysis weakly developed with 5 granules. Chela smooth with punctuations; internal face with some strong granules; carinae vestigial; absence of any scalloping of the proximal dentate margin of fixed finger; fingers with a double row of denticles fused at the proximal 1/2; inner accessory granules inconspicuous. Chelicerae typical of Scorpionoidea (Vachon 1963); teeth moderately sharp. Trichobothriotaxy type C; orthobothriotaxic (Vachon 1974). Legs: tarsi with two rows of 3-4 spiniform setae. Tarsal spurs moderate. Hemispermatophore unknown.

REMARKS: The new species can be distinguished from *Hemiscorpius socotranus* by the following characters: (i) smaller global size and quite different morphometric values (see Table 1), (ii) distinct coloration pattern, reddish to reddish-brown; chela fingers not dark, (iii) dorsal carinae of metasomal segments I-IV with posterior spinoid granules, (iv) telson bulbous and not elongated, (v) internal aspect of pedipalp femur without large spinoid granules. From *H. tellinii* it differs by markedly distinct morphometric ratios of the metasomal segments. Males of *H. tellinii* remain unknown, however, in all *Hemiscorpius* species, males are generally slender and have more elongated metasomal segments.

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