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ORIGINAL ARTICLE

Taxonomy of the freshwater crab genus *Neopseudothelphusa* Pretzmann, 1965 (Decapoda: Brachyura: Pseudothelphusidae), with the description of a new genus

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ABSTRACT

The taxonomy of the genus *Neopseudothelphusa* Pretzmann, 1965 is revised based on the morphology of the male first gonopod. A new genus, *Culterthelphusa*, is here proposed to receive *Neopseudothelphusa simoni* (Rathbun, 1905), while the genus *Neopseudothelphusa* is restricted to its type species, *Neopseudothelphusa fossor* (Rathbun, 1898). Illustrations of the first gonopod of both genera are provided.

KEY WORDS

Culterthelphusa, first gonopod, Kingsleyini, Neotropical region, macroinvertebrate fauna.

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Introduction

In most pseudothelphusid crabs, the carapace morphology is quite uniform and distinction at generic and specific level is only possible using the morphological characteristics of the male first gonopod (Rodriguez, 1982; Rodríguez and Magalhães, 2005). *Neopseudothelphusa* was initially established by Pretzmann (1965) as a subgenus of *Guinotia* Pretzmann, 1965, to accommodate eight species. Nevertheless, the diagnostic characters provided by Pretzmann were little restrictive and, therefore, unsatisfactory for ascertaining the identity of *Neopseudothelphusa*. Rodriguez (1982) raised *Neopseudothelphusa* to full genus status, and transferred six of its eight species to other genera of Kingsleyini Bott, 1970, restricting it to two species: *Neopseudothelphusa fossor* (Rathbun, 1898) – its type species – and *Neopseudothelphusa simoni* (Rathbun, 1905). Even restricted to two species, Rodriguez (1982) acknowledged the artificiality of *Neopseudothelphusa* and justified the grouping of *N. fossor* with *N. simoni* merely on the basis of the proximity of their distribution limits in the Central Cordillera of Venezuela.

In a recent phylogenetic study of the Kingsleyini based on morphological characters (Pedraza, 2015), which included 49 out of 59 species currently known in the tribe, *N. simoni* and *N. fossor* were observed to exhibit remarkable differences in the morphology of their first gonopod. Therefore, a new genus, *Culterthelphusa*, is proposed herein to accommodate *N. simoni*, since the particularities in the morphology of its first gonopod do not allow its allocation in any other genus of Kingsleyini. *Neopseudothelphusa* is thus restricted to its type species, *N. fossor*.

Material and Methods

The terminology of the first gonopod follows Smalley (1964) and Pedraza *et al.* (2016). Line drawings of the first gonopod were made based on drawings and photographs produced with a stereomicroscope equipped with a camera lucida and then edited in Adobe Illustrator CC 2015. The following abbreviations were used: G1, male first gonopod; MZUSP, Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil; USNM, National Museum of Natural History, Smithsonian Institution, Washington, DC, USA. Diagnostic characters are based exclusively on the morphology of the male first gonopod.

Taxonomy

Family Pseudothelphusidae Ortmann, 1893

Tribe Kingsleyini Bott, 1970

Genus *Neopseudothelphusa* Pretzmann, 1965

Guinotia (*Neopseudothelphusa*) Pretzmann, 1965: 3.
Eudaniela (*Neopseudothelphusa*) — Pretzmann, 1971: 16. — Pretzmann, 1972: 19.
Neopseudothelphusa — Rodriguez, 1982: 167. — Ng *et al.*, 2008: 175 [list]. — Villalobos and Álvarez, 2008: 299 [list]. — De Grave *et al.*, 2009: 41 [list].

Diagnosis. G1 with marginal process straight, flat; apex truncated, fused to crest of distal lobe of apical plate. Apical plate narrow, subtriangular; distal and proximal lobes well distinct, split by deep notch; distal lobe larger than proximal lobe. Strong subterminal bulge in lateral view, its margin uniformly rounded.

Type species. Neopseudothelphusa fossor (Rathbun, 1898), by original designation.

Included species. Neopseudothelphusa fossor.

Distribution. Venezuela: Aragua, Distrito Capital, Miranda, Vargas.

Remarks. Neopseudothelphusa fossor is unique among the Kingsleyini in having the G1 with a strong subterminal bulge in lateral view and with its margin uniformly rounded (Fig. 1A–C), and the marginal process of first gonopod fused to the crest of the distal lobe of the apical plate (Fig. 1B). The morphology of the G1 of *N. fossor* most resemble those of *Kingsleya attenboroughi* Pinheiro & Santana, 2016, *Kingsleya gustavoi* Magalhães, 2005, *Kingsleya hewashimi* Magalhães & Türkay, 2008, *Kingsleya latifrons* (Randall, 1840), *Kingsleya siolii* (Bott, 1967), and *Kingsleya ytupora* Magalhães, 1986, since the apical plate is narrow and subtriangular, with the distal and proximal lobes well distinct (Fig. 1A, C). Similarities and differences between *N. fossor* and *Culterthelphusa simoni* n. comb. are discussed in the remarks for the new genus.

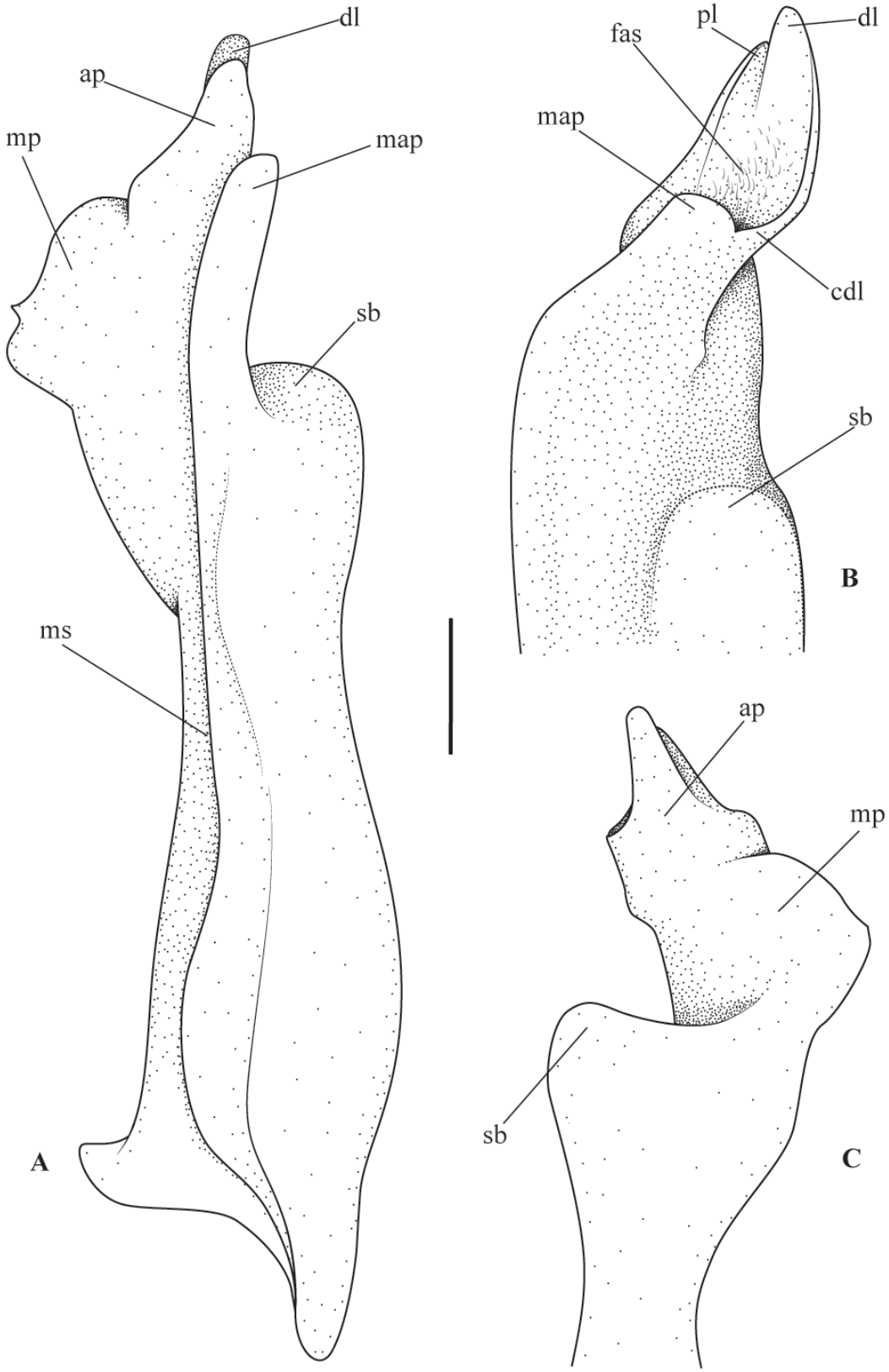

Figure 1. *Neopseudothelphusa fossor* (Rathbun, 1898) (USNM 23848), left first gonopod. A, abdominal view; B, lateral view; C, sternal view. Abbreviations: ap, apical plate; cdl, crest of distal lobe; dl, distal lobe; fas, field of apical spines; map, marginal process; mp, mesial process; ms, marginal suture; pl, proximal lobe; sb, subapical bulge. Scale bar = 1 mm.

Neopseudothelphusa fossor (Rathbun, 1898) (Fig. 1)

Pseudothelphusa fossor Rathbun, 1898: 520. — Rathbun, 1904: 242. — Rathbun, 1905: 290, fig. 82. — Rathbun, 1906: 501. — Young, 1900: 208. — Coifmann, 1939: 108 [list]. — Rodríguez, 1966: 115, fig. 3.
Guinotia (*Neopseudothelphusa*) *fossor* — Pretzmann, 1965: 3.
Eudaniela (*Neopseudothelphusa*) *fossor fossor* — Pretzmann, 1971: 16. — Pretzmann, 1972: 21.
Eudaniela (*Neopseudothelphusa*) *fossor aulae* Pretzmann, 1972: 22.
Kingsleya fossor fossor — Bott, 1970: 356, figs. 9, 10.
Kingsleya fossor aulae — Bott, 1970: 360, figs. 11, 12.
Neopseudothelphusa fossor — Rodríguez, 1981: 49 [list]. — Rodriguez, 1982: 168, fig. 117 — Ng *et al.*, 2008: 175 [list] — Villalobos and Álvarez, 2008: 299 [list].

Material examined. Venezuela, Vargas, La Guaira, 2.vii.1990, Lion & Robinson *leg.*, M. Campos *det.*, 3 males, 2 females (USNM 23848).

Type locality. Venezuela, Distrito Capital: La Guaira.

Genus *Culterthelphusa* n. gen.

Diagnosis. G1 with marginal process large; apex sharp, slightly curved laterally. Mesial process simple, straight, cultriform, about twice as large as the apical plate. Apical plate wide, subquadrate, apex slightly bent to sternal side; distal and proximal lobes totally fused to apical plate.

Type species. Culterthelphusa simoni (Rathbun, 1905), n. comb., by monotypy and present designation.

Distribution. Venezuela: Aragua, Distrito Capital, Guárico, Miranda.

Etymology. The name *Culterthelphusa* is formed by the combination of the Latin word "cultratus", meaning knife, in reference to the shape of the mesial process of the first gonopod, which is unique in the tribe, with the suffix "thelphusa" for freshwater crab. The gender is feminine.

Remarks. Culterthelphusa n. gen. is established to accommodate *C. simoni* n. comb., formerly included in *Neopseudothelphusa*. Likewise, *Culterthelphusa* n. gen. is assigned to the tribe Kingsleyini as it shows the following diagnostic characters of the tribe: G1 with an apical plate projected beyond the opening of the spermatic channel; and G1 with basis widened along the sterno-abdominal axis. *Culterthelphusa simoni* n. comb. is unique in Kingsleyini in having the G1 with a simple mesial process, about three times longer than wide, cultriform in shape (Fig. 2A, C), and having the marginal process large, subtriangular and prolonged beyond the opening of spermatic channel (Fig. 2A, B).

Culterthelphusa simoni (Rathbun, 1905) n. comb. (Fig. 2)

Pseudothelphusa simoni Rathbun, 1905: 291. — Rathbun, 1906: 501. — Coifmann, 1939: 109 [list]. — Weibezahn, 1952: 68. — Rodríguez, 1966: 118, fig 4.
Pseudothelphusa chacei Crane, 1949: 26, fig. 3. — Weibezahn, 1952: 70.
Guinotia (*Neopseudothelphusa*) *simoni simoni* — Pretzmann, 1965: 3.
Guinotia (*Neopseudothelphusa*) *simoni chacei* — Pretzmann, 1965: 3.
Potamocarcinus (*Kingsleya*) *venezuelensis simoni* — Bott, 1967: 302, fig. 2.
Potamocarcinus (*Kingsleya*) *venezuelensis venezuelensis* — Bott, 1967: 302, fig. 1.
Eudaniela (*Microthelphusa*) *simoni simoni* — Pretzmann, 1971: 17. — Pretzmann, 1972: 23.
Eudaniela (*Microthelphusa*) *simoni chacei* — Pretzmann, 1971: 17. — Pretzmann, 1972: 24.
Neopseudothelphusa simoni — Rodríguez, 1981: 49 [list]. — Rodriguez, 1982: 167, fig 116. — Magalhães, 1987: 55, figs. 1, 2. — Ng *et al.*, 2008: 175 [list].

Material examined. Venezuela, Aragua, Rancho Grande, 1100 m., 15.iii.1945, J. Crane *leg.*, 1 male (USNM 87067). — Miranda, Parque Nacional Guatopo, 750 m., C. Brandão *leg.*, C. Magalhães det., 1 male (MZUSP 6388); Turgua, 1100 m, 14.viii.1948, M. Campos det., 1 male, 1 female (USNM 89643); Turgua, 1099 m., 11.ix.1948, F. Martins *leg.*, M.

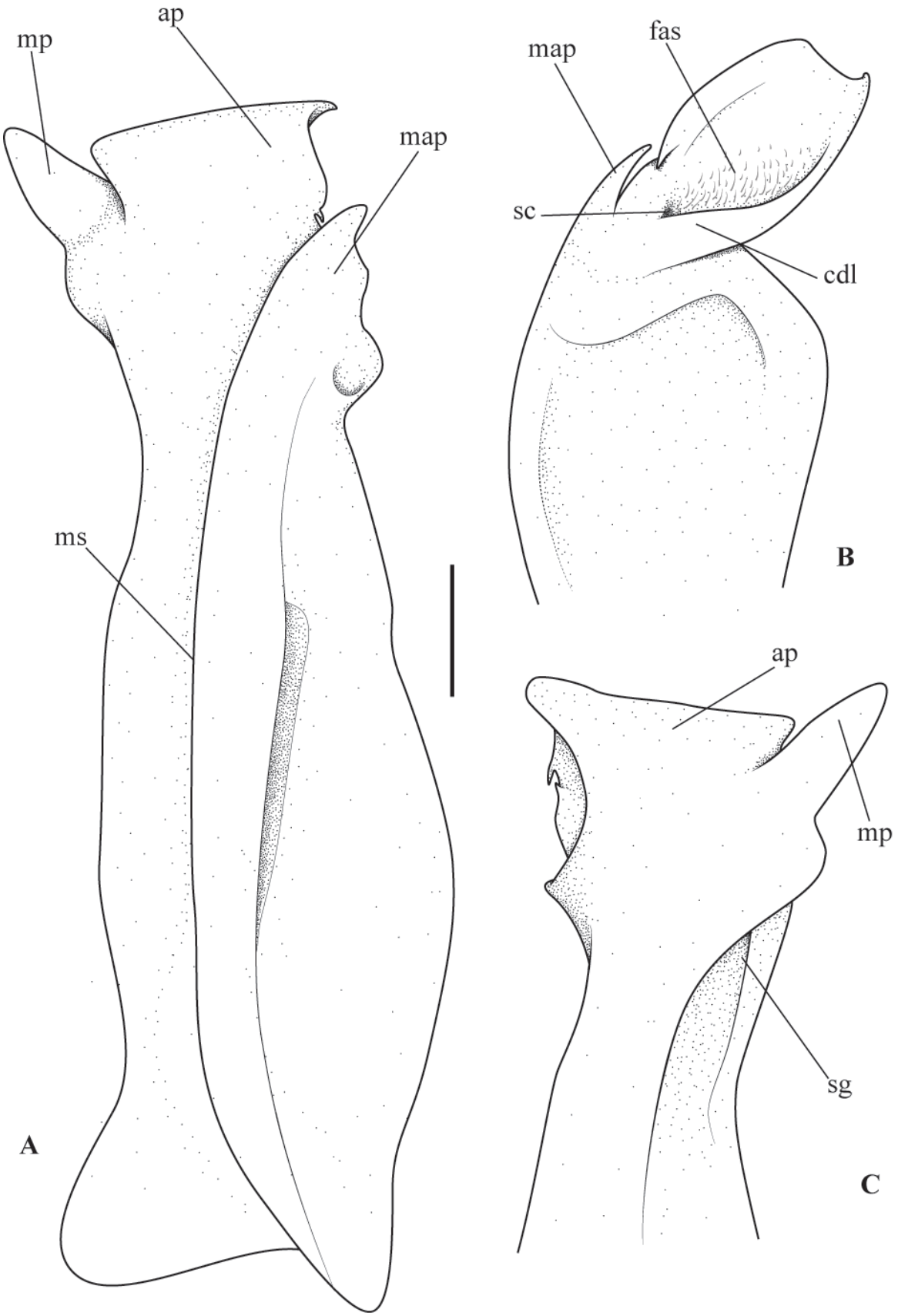

Figure 2. *Culterthelphusa simoni* (Rathbun, 1905) n. comb. (MZUSP 6388), left first gonopod. A, abdominal view; B, lateral view; C, sternal view. Abbreviations: ap, apical plate; cdl, crest of distal lobe; fas, field of apical spines; map, marginal process; mp, mesial process; ms, marginal suture; sc, opening of spermatic channel; sg, subapical groove. Scale bar = 1mm.

Campos det., 2 males (USNM 90591). Turgua, 1100 m, 11.ix.1949, F. Martins *leg.*, M. Campos det., 2 males (USNM 90602).

Type locality. Venezuela, Aragua: Colonia Tovar.

Remarks. Culterthelphusa simoni n. comb. differs from *Neopseudothelphusa fossor* in the following characters of the G1: (i) the marginal process is slightly curved to the lateral side, the apex is sharp, prolonged above the opening of spermatic channel in *C. simoni* n. comb. (Fig. 2A) [marginal process straight, apex truncated and prolonged at the same level of the opening of spermatic channel in *N. fossor* (Fig. 1A)]; (ii) the apex of the marginal process is well distinct from the crest of the distal lobe of the apical plate in *C. simoni* n. comb. (Fig. 2B) [apex of marginal process fused to the crest of the distal lobe of the apical plate in *N. fossor* (Fig. 1B)]; (iii) the apical plate is large, wide, and subquadrate in *C. simoni* n. comb. (Fig. 2 A, B) [apical plate narrow and subtriangular in *N. fossor* (Fig. 1A, B)]; (iv) the distal and proximal lobes of the apical plate are indistinct in *C. simoni* n. comb. (Fig. 2B) [distal and proximal lobes of the apical plate well distinct, split by a deep notch in *N. fossor* (Fig. 1A–C)]; (v) there is a deep subterminal groove in sternal view, preceding the mesial process in *C. simoni* n. comb. (Fig. 2C) [sternal surface smooth, subterminal groove preceding the mesial process absent in *N. fossor* (Fig. 1C)]; (vi) the lateral surface is flat in the subterminal region, devoid of any subterminal bulge in *C. simoni* n. comb. (Fig. 2A–C) [strong subterminal bulge as seen in lateral view in *N. fossor* (Fig. 1A–C)]; (vii) the mesial process is about twice as large as the apical plate, and is cultriformin *C. simoni* n. comb. (Fig. 2A, B) [mesial process almost the same size of the apical plate, subquadrate, in *N. fossor* (Fig. 1A, B)].

The morphology of the G1 of *Culterthelphusa simoni* n. comb. closely resembles that of *Prionothelphusa eliasi* Rodriguez, 1980 and *Microthelphusa racenisi* (Rodríguez, 1966) since in these three species the apical plate is wide, subquadrate, and the distal and proximal lobes are complete fused.

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