

On *Coscinida tibialis* Simon, 1895 (Araneae, Theridiidae): genital morphology, distribution, web building and a new synonym

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Summary

Coscinida tibialis Simon, 1895 is redescribed and notes on the web building and mating behaviour are included. In the female genital organ, the copulatory duct and receptaculum form a sclerotised, closely associated complex. The narrow duct is strongly coiled before entering the receptaculum. During insertion the female turns through 180°, so that the mates face in the same direction. Sperm induction takes place independently of copulation. *Coscinida tibialis* builds a reduced web, with only two capture threads, as in the genus *Episinus*. First records are presented from Yemen, Tunisia, the Cape Verde Islands, and from Asia, Thailand. *Euryopsis euterpe* Denis, 1954 from Algeria is synonymised with *C. tibialis*, **syn. n.**

Introduction

In the course of an investigation of the theridiid fauna of Yemen, *Coscinida tibialis* Simon, 1895 was frequently collected by sieving ground litter. This species appears to be the most widespread representative of the genus, being known hitherto from mainland Africa (Simon, 1895; Miller, 1970), Israel (Levy, 1998), the Balearic Islands (Orghidan *et al.*, 1975) and the Canary Islands (Wunderlich, 1987). New records are now added from Yemen, Tunisia, Cape Verde Islands and SE Asia, together with a new synonym from Algeria, *Euryopsis euterpe* Denis, 1954. The genus *Coscinida* is currently known from 13 species from Africa and SE Asia to Japan (Platnick, 2004). Levi & Levi (1962) indicated close relationship to *Stemmops*, which was placed among the Pholcommatinae together with *Phoroncidia* etc. by Agnarsson (2004). This lineage contains species with considerable web reduction. Also in *C. tibialis* the web consists of only a few threads (Fig. 2), similar to that in *C. japonica* Yoshida, 1994 (see Ogasawara, 1998).

Abbreviations and depositories: CRB=Collection R. Bosmans, Gent; CRS=Collection A. Russell-Smith, Kent; CTh=Collection K. Thaler & B. Knoflach,

Innsbruck; MHNG=Muséum d’Histoire Naturelle, Genève; MNHN=Muséum National d’Histoire Naturelle, Paris; MRAC=Musée Royal de l’Afrique Centrale, Tervuren; NMW=Naturhistorisches Museum Wien. All measurements are in mm.

***Coscinida tibialis* Simon, 1895 (Figs. 1–10)**

Coscinida tibialis Simon, 1895: 137; D ♂♀, Biskra, Algeria.

Euryopsis euterpe Denis, 1954: 311, figs. 1–3; D ♀, Touggourt, Algeria, **syn. nov.**

Material examined: ALGERIA: Alger, Les Eucalyptus, 35 m, 1♂, abandoned land, 25 June 1988, leg. Bosmans (CRB); Batna, 5 km S. Arris, valley of Oued El Abiod, 1150 m, 1♂, litter in irrigated garden, 9 April 1982, leg. Bosmans (CRB); Biskra, Biskra oasis, 6♂ 2♀ 1 subadult ♂ 2 juvs (types), AR 10620 MNHN, examined (Simon, 1895); Tizi Ouzou, Boukhalfa, 180 m, 1♂, pitfalls in *Olea* maquis, 8 March 1990, leg. Bosmans (CRB). TUNISIA: Kebili, Douz W., 1♀, in oasis garden, 20 December 2000, leg. Bosmans (CRB). YEMEN: Sana’a, 15°21’N, 44°13’E, 2300 m, garden: 1♀ (MNHN), 22 July 1998; 1♀ (MHNG), 3 August 1998 (adult on 16 August 1998); 2♂ 2♀ (CTh), 22 August 1998; 2♀ (MNHN), August 1998; 1♂ 2♀ (NMW), 8 January 1999; 1♀ (NMW), 28 September 1999. Khamis Bani Sa’d, 15°11’N, 43°25’E, 550 m, route Sana’a–Al Hudaydah, cultivated area, 1♀ (NMW), 31 August 1999; 1♂ 1♀ (MHNG), 28 March 2000. Wadi Warazan, 13°25’N, 44°15’E, 1200 m, 1♀ 3 juvs (MNHN), 12 July 1999. All leg. van Harten. CÔTE D’IVOIRE: Gagnoa, upland rice field, 2♀, 10 June 1994, leg. Russell-Smith (CRS). CAPE VERDE IS.: Santiago, São Jorge dos Orgãos, 15°03’N, 23°37’W, 400 m, garden, 2♂ 3♀ 1 juv. (MRAC), 15 December 1999–10 January 2000, 1♀ (MNHN) 11 December 2001–9 January 2002, leg. van Harten. SPAIN: Gran Canaria, Embalse de Chira, 825 m, 27°54’21.4”N, 15°38’20.6”W, 1♂, 14 February 2001, under stone near water supply dam, leg. Knoflach & Thaler (CTh). THAILAND: Chiang Mai, Mae Hia, 330 m: 1♀ (MHNG), 30 July–14 November 1987; 1♀ (MHNG), 28 November–12 December 1987; 1♀ (MHNG), 17–24 January 1988; 1♀ (MHNG),



Fig. 1: *Coscinida tibialis* Simon, male from Yemen, Sana’a. Average body length 1.7 mm.

24 January–25 February 1988, pitfall trap in teak plantation, leg. P. Schwendinger.

Description: See also Levi & Levi (1962), Miller (1970), Levy (1998).

Measurements: [$\delta/\text{♀}$, $n=5/5$, min-max (mean)]: Total length 1.5–1.8 (1.7)/1.7–2.2 (1.9), carapace length 0.6–0.7 (0.6)/0.6–0.7 (0.7), width 0.5–0.6 (0.6)/0.5–0.6 (0.6), length femur I 0.7–0.8 (0.8)/0.6–0.7 (0.7), tibia I 0.6–0.7 (0.7)/0.6 (0.6). Femur of male palp *c.* 0.25 long. Legs: 4123. Trichobothria in retrodorsal/prodorsal row on tibia of female palp 1/1, of female (male) legs I 3/2 (3/2), II 3/1 (2/2), III 2/3 (2/3), IV 3/3 (3/3), 1♂ 1♀ examined. Metatarsi I–III with 1 trichobothrium, position on I/II/III in female 0.58/0.57/0.59, in male 0.58/0.48/0.60; female (male) metatarsi I–IV 1.3 (1.3), 1.1 (1.1), 1.1 (1.1), 1.4 (1.3) times longer than tarsi, shorter than tibiae. Tarsal claws of legs with 3 (2) teeth in female (male). Middle tarsal claw less than half as long as lateral ones and strongly curved towards ventral side of tarsus. Position of tarsal organ on female palp 0.71, on female

(male) legs I–IV 0.59 (0.49), 0.15 (0.12), 0.12 (0.12), 0.13 (0.11). The basal position of the tarsal organ on legs II–IV is unusual. Leg measurements, female ($n=1$):

	Fe	Pa	Ti	Mt	Ta	Total
Palp	0.16	0.10	0.10	—	0.21	0.57
I	0.79	0.33	0.68	0.63	0.48	2.91
II	0.62	0.28	0.47	0.46	0.40	2.23
III	0.56	0.25	0.40	0.42	0.40	2.03
IV	0.87	0.35	0.72	0.67	0.49	3.10

Leg measurements, male ($n=1$):

	Fe	Pa	Ti	Mt	Ta	Total
I	0.80	0.33	0.71	0.66	0.50	3.00
II	0.60	0.25	0.46	0.47	0.41	2.19
III	0.57	0.24	0.43	0.44	0.41	2.09
IV	0.89	0.34	0.74	0.69	0.53	3.19

Somatic features, coloration (based on living and preserved material): Eyes rather large and grouped closely together. Anterior median eyes smaller than others. Posterior median eyes closer to laterals than to each other (see Levy, 1998: 161). Clypeus with distinct recess below eye region. Carapace in profile with median postcephalic area highest and posterior region considerably sloping. Male stridulatory ridges on posterior declivity of carapace absent. Chelicerae with three small denticles on promargin. Sternum broad behind, separating coxae IV by their diameter. Legs moderately long and slender, legs IV longest. Abdomen 1.6–1.7 (1.2–1.5) times longer than wide in male (female). In male rather slender and tapering, and spinnerets visible in dorsal view, in female posteriorly rounded, protruding above spinnerets, not therefore visible in dorsal view. Epigaster not protruding. Colulus absent.

Carapace light yellow-brown, with thin greyish margins and indistinct greyish postcephalic region. Eye region black, eyes surrounded by dark pigmented circles. Chelicerae, gnathocoxae and labium light yellow-brown. Tarsus of male palp reddish brown. Sternum light yellow-brown, sometimes with dark margins, sometimes uniformly grey. Legs and palps uniformly light yellow-brown. In female, tibia I sometimes dark. Abdomen with extensive dark markings on light brown background and 6–10 white spots (Fig. 1). Epigaster greyish, in male with two pale circles, book lung covers pale brown. Venter uniformly greyish to pale brown. Spinnerets light brown to greyish.

Male palp (Figs. 3–6): In males preserved in alcohol the palps become artificially contorted, so that the cymbium becomes ventral, with the bulb facing dorsally. In living males the palps are held in the usual position, as in most Theridiidae, with the bulb facing ventrally. Tibia rather short, 0.08–0.09 long, with one retrolateral and one dorsal trichobothrium. Cymbium *c.* 0.3 long, asymmetrical, ending in sclerotised, pointed tip on pro-lateral side (Figs. 3–5). Cymbial hook present, on distal retromargin of cymbium, hidden by conductor in entire palp (Fig. 5, arrow). Subtegulum on dorsal side of bulb, tegulum on ventral and retrolateral side. Sperm

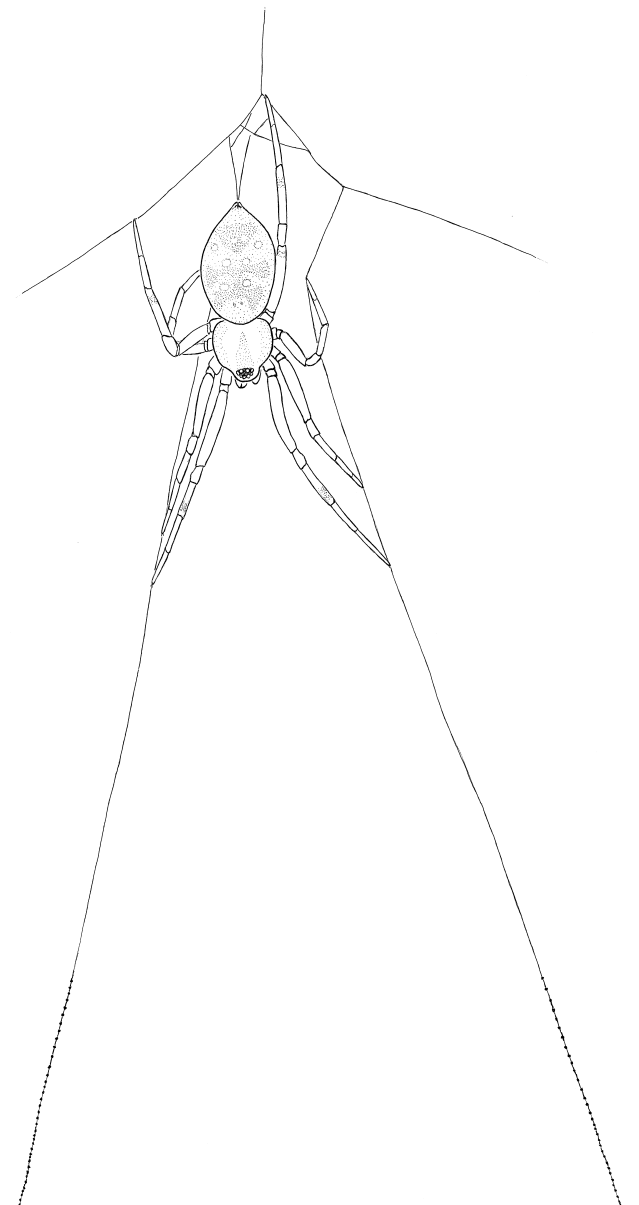


Fig. 2: *Coscinida tibialis* Simon, female with web (Yemen, Sana'a). Average body length 1.9 mm.

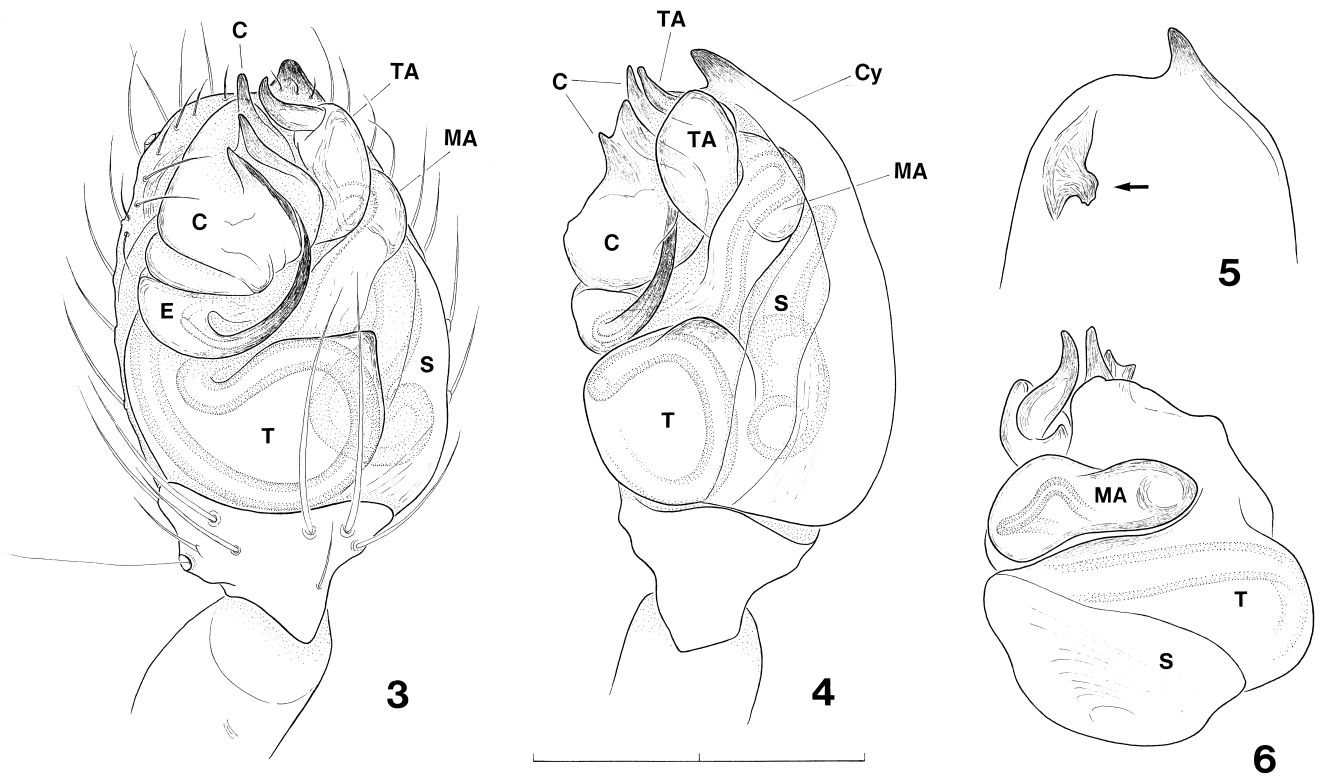


Fig. 3–6: *Coscinida tibialis* Simon, right male palp (Yemen, Sana'a). **3** Ventral view; **4** Prolateral view; **5** Tip of cymbium, ventral view; **6** Bulbus, dorsal view. Abbreviations: C=conductor, Cy=cymbium, E=embolus, MA=median apophysis, S=subtegulum, T=tegulum, TA=tegular apophysis. Scale line=0.2 mm.

duct forms large coil in tegulum, passes along median apophysis and then enters embolus, altogether *c.* 1.2 long. Conductor as retrolateral outgrowth of tegulum, ending in small, finger-like dorsal process, and bifurcated ventral process, which contains a furrow guiding the embolus (Fig. 3). Median apophysis elongate, in dorsal-prolateral position, retrolateral end broadly rounded, with concavity which fits to cymbial hook (Fig. 6). Tegular apophysis in prolateral position, basal part broad and weakly sclerotised, distal part tapering, curved and sclerotised (Figs. 3, 4, 6). Embolar base small and slender. Distal part of embolus 0.16 long, heavily sclerotised, pointing anticlockwise in right palp (Fig. 3).

Epigynum/vulva (Figs. 7–10): Epigynum inconspicuous, not protruding, weakly sclerotised, divided in mid-line by two sclerotised, sinuous ridges, without clear atrium (Figs. 7, 9). Copulatory orifices indistinct, slit-like, situated at edges of median ridge. Copulatory ducts with narrow lumen, closely associated with receptacula. Whole complex of receptaculum and copulatory duct sclerotised and visible through integument. Remarkably, the ducts turn anteriorly, where they widen to form a small chamber, then narrow again and form numerous coils within this complex before entering the receptaculum on inner dorsal side (Figs. 7–8, arrow). The exact course of these narrow windings could not be resolved.

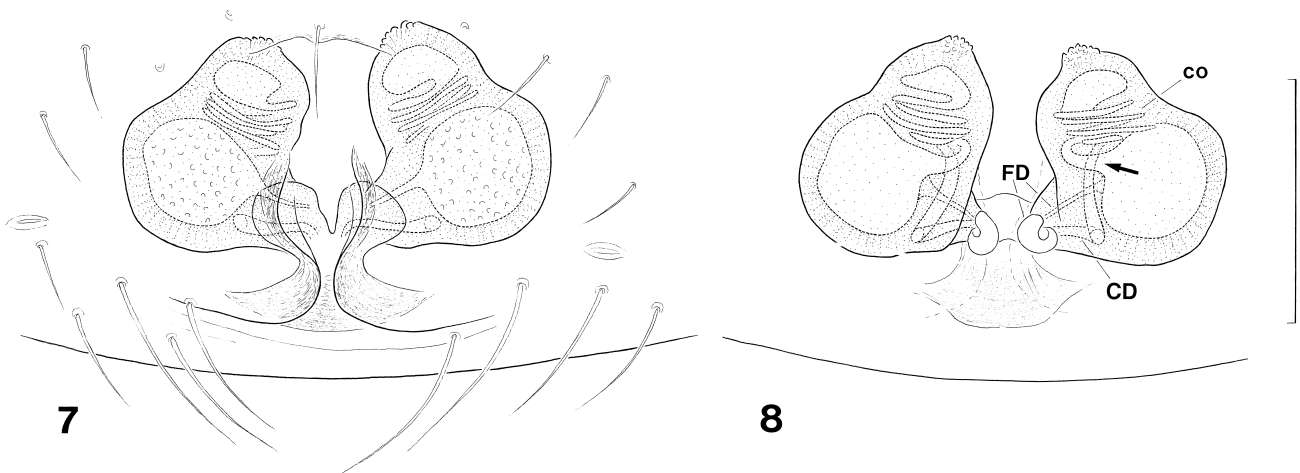


Fig. 7–8: *Coscinida tibialis* Simon, epigynum/vulva (Yemen, Sana'a). **7** Ventral view; **8** Dorsal view. Abbreviations: CD=copulatory duct, co=coils of duct lumen, FD=fertilisation duct. Scale line=0.1 mm.

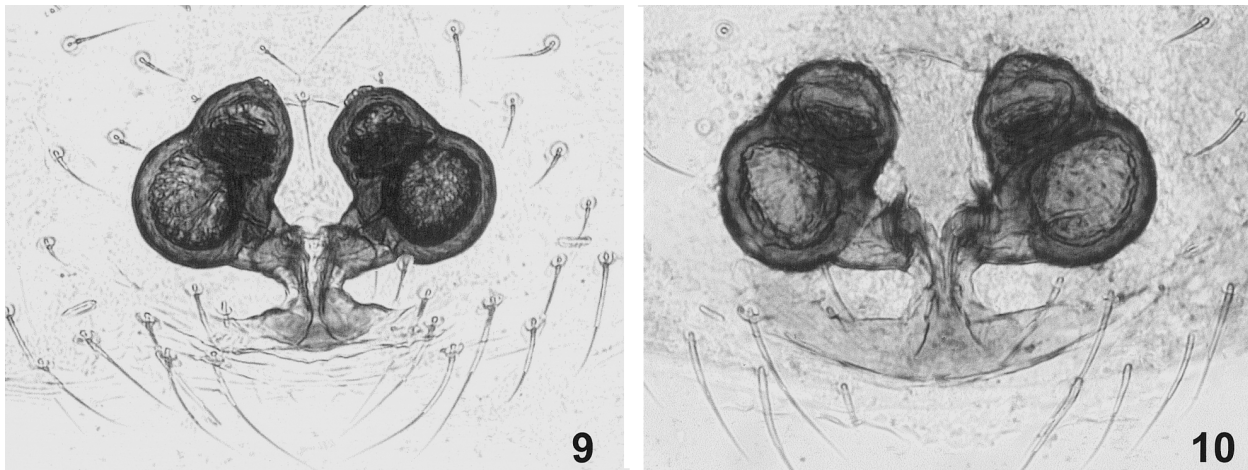


Fig. 9–10: *Coscinida tibialis* Simon, epigynum/vulva, ventral view (Auto-Montage digital photos). **9** Yemen; **10** Thailand.

Anterior part of complex with field of glandular pores close to widening of lumen. Ventral side of receptacula with evenly spaced pores. Fertilisation ducts short.

Synonymy: *Euryopsis euterpe* was described from a single female from the oasis of Touggourt in Algeria (Denis, 1954), which is 140 km south of the oasis of Biskra, the type locality of *Coscinida tibialis*. It is synonymised with *C. tibialis* from the literature because of the following characters: illustrations of female habitus and genitalia agree fully with our material; dimensions, general appearance, colour pattern, shape of carapace, epigyne and receptacula closely resemble those of *C. tibialis*, which unambiguously confirms this synonymy.

Web: The web of *C. tibialis* consists of only a few threads (Fig. 2), as in *C. japonica* (see Ogasawara, 1998). Two basally-sticky capture threads are kept in tension by the spider's forelegs, while the hind legs and spinnerets hold the supporting anchoring threads, the spider facing the ground substrate. Similar reduced webs are well known in *Episinus* (Holm, 1938; Bristowe, 1958). The overall structure closely resembles that of *Episinus angulatus* (Blackwall, 1836) (see Holm, 1938).

Mating behaviour: One single observation on the mating behaviour of *C. tibialis* was rather incomplete, as the beginning and perhaps the main part of copulation escaped notice. Therefore, it is still unknown whether courtship proceeds via a mating thread or not. Reduction of the male stridulatory organ indicates that vibratory courtship may be indistinct. As in *Episinus maculipes* Cavanna, 1876 (see Knoflach, 2004), the female rotated 180° during insertion and thereby changed her position, so that both partners faced in the same direction. Artificial torsion of the male palps, when kept in alcohol, appears to provide evidence that the palps are highly movable. This perhaps may be necessary to accommodate the female rotation. Two minutes after rotation the pair quickly separated. A mating plug was not discernible. One hour after copulation the male started constructing a sperm web. The whole procedure lasted 6.9 min, two min of which were used for constructing the sperm web, and during four minutes of which the male remained motionless upon the sperm web. For induction the male dipped his

right palp five times into the large sperm droplet, but a large portion of the droplet was not absorbed. During the next three hours no further insertion attempts were observed. Thus, sperm induction takes place independently of copulation. *Coscinida tibialis* follows the *Steatoda*-type of copulation (Knoflach, 2004).

Egg-sac: With a dense, whitish inner layer and a white, loosely woven, woolly outer layer, similar to that of *C. japonica* (see Ogasawara, 1998). One egg-sac contained 11 eggs.

Distribution, habitat: *Coscinida tibialis* is apparently a widespread pantropical species, hitherto known from mainland Africa, Algeria and Angola (Simon, 1895; Denis, 1954, Miller, 1970), Israel (Levy, 1998), the Balearic Islands (Orghidan *et al.*, 1975) and the Canary Islands (Wunderlich, 1987). New records are added here from the Arabian Peninsula (Yemen), Tunisia, the Cape Verde Islands, Ivory Coast and from SE Asia, Thailand. Its northernmost free-living occurrence comes from Algeria (Les Eucalyptus near Alger). Remarkably, it has also been reported from the walls of the cave "Cueva Dragan" in Mallorca (Orghidan *et al.*, 1975, det. M. Gruia). Otherwise, *C. tibialis* is a ground-dwelling species and has been collected from litter and under stones. It occurs mainly semisynanthropically in gardens and cultivated areas.

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