# Description of *Pratylenchus jordanensis* n. sp. (Nematoda : Tylenchida) and notes on other Tylenchida from Jordan

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SUMMARY

*Pratylenchus jordanensis* n. sp., recovered from the rhizosphere of grapevine in Jordan, is described and illustrated. Its main diagnostic features are absence of males, spermatheca devoid of spermatozoa, cephalic region slightly offset from the body and with two annules, short stylet (14.6 µm) with anteriorly directed knobs, V coefficient of 77.8, presence of intestinal fasciculi, undifferentiated post-vulval sac (16.2 µm in length), four incisures in the lateral field (often with additional oblique striae in the central band at mid-body), conoid tail with 21 annules and smooth tail terminus with a characteristic indentation. Notes are also given on certain morphological features of *Helicotylenchus microcephalus* Sher, 1966, *Tylenchorhynchus clarus* Allen, 1955 and *T. goffarti* Sturhan, 1966 found in Jordan.

RÉSUMÉ

*Description de* Pratylenchus jordanensis *n. sp. (Nematoda : Tylenchida) et notes sur d'autres Tylenchida de Jordanie*

*Pratylenchus jordanensis* n. sp., provenant de la rhizosphère de vigne (*Vitis* sp.) en Jordanie, est décrit et illustré. Ses grands traits diagnostiques sont l'absence de mâles, la spermathèque dépourvue de spermatozoïdes, la région céphalique légèrement séparée et avec deux anneaux, un stylet court (14.6 µm) avec boutons basaux inclinés antérieurement, un coefficient V de 77,8, la présence de fasciculi intestinaux, un sac post-vulvaire long de 16 µm et non-différencié, quatre incisures dans le champ latéral (des lignes obliques supplémentaires apparaissent souvent dans la bande centrale, à mi-corps), une queue conoïde comportant 21 anneaux, en moyenne, et une extrémité lisse avec une dentelure caractéristique. Des notes sont par ailleurs données sur *Helicotylenchus microcephalus* Sher, 1966, *Tylenchorhynchus clarus* Allen, 1955 et *T. goffarti* Sturhan, 1966 trouvés en Jordanie.

A new species of *Pratylenchus* Filipjev, 1936 was isolated from soil around roots of grapevine grown under irrigation in Wadi Dhulail, Jordan. It is described herein as *P. jordanensis* n. sp. Notes are also given on certain morphological features of *Helicotylenchus microcephalus* Sher, 1966, *Tylenchorhynchus clarus* Allen, 1955 and *T. goffarti* Sturhan, 1966 found in this country.

## Materials and methods

Nematodes were extracted from soil by a tray modification of the Baermann funnel method (Whitehead & Hemming, 1965). Specimens were subsequently killed by heat, fixed in TAF, stained in hot (60-65°) lactophenol containing either cotton blue (*P. jordanensis* n. sp.) or acid fuchsin (the other nematodes) and finally processed to anhydrous glycerol containing traces of picric acid by the rapid method of Baker (1953). A Zeiss Photomicroscope III, fitted with an ocular micrometer and a camera lucida, was used for measuring and drawing the specimens. Standard error of the mean has been calculated for each of the main measurements and coefficients.

**Pratylenchus jordanensis** n. sp.
(Fig. 1 A-H)

DIMENSIONS

*Holotype female :* L = 0.43 mm ; a = 29 ; b = 5.2 ; b′ = 3.5 ; c = 16.5 ; c′ = 2.9 ; V = $^{30.5-79.3-3.3}$ ; stylet = 14.5 µm.

*Paratype females* ($n$ = 14) : L = 0. 49 ± 0.014 (0.38-0.59) mm ; a = 29 ± 0.49 (26-32) ; b = 5.3 ± 0.10 (4.5-5.9) ; b′ ($n$ = 13) = 3.8 ± 0.08 (3.2-4.1) ; c ($n$ = 11) = 18.3 ± 0.88 (16.1-25.0) ; c′ ($n$ = 11) = 2.6 ± 0.12 (2.1-3.0) ; V = 77.8 ± 0.25 (75.1-79.1) ; stylet = 14.6 ± 0.05 (14.5-15.0) µm.

DESCRIPTION

*Females :* Body almost straight to ventrally arcuate when killed by heat. Annule width 1.0-1.5 µm at mid-body. Lateral field about 1/3 of mid-body diameter, non-areolated and with four incisures ; additional oblique striae often occur in the central band of lateral field at mid-body. Inner incisures smooth, fusing in the oesophageal and caudal regions ; outer incisures crenate. Cephalic region low, 2.0-2.5 µm high, with two annules and slightly offset from the body. Cephalic framework sclerotized, with the outer margins extending into the body for almost two annules. Stylet knobs indented anteriorly. Vestibule extension 9-10 µm long. Anterior cephalids 2-3 annules behind cephalic region ; posterior cephalids rarely observed, 8-9 annules behind cephalic region. Excretory pore 1-13 annules anterior to the oesophago-intestinal junction, from 1-6 annules behind hemizonid and at 81.2 ± 1.52 (67-90) µm from anterior end. Hemizonid 2-3 annules long. Hemizonion observed in four specimens, 5-9 annules behind excretory pore. Orifice of dorsal oesophageal gland 3.4 ± 0.06 (3.0-3.5) µm from stylet base. Median oesophageal bulb 12.5-14 × 8.5-10 µm. Oesophageal glands overlapping the intestine, with the longest overlap ventrally situated and 39.0 ± 2.28 (29.0-52.5) µm long ; gland nuclei arranged almost in tandem. Convoluted canals (= intestinal fasciculi) present in the intestinal region : in a few specimens, extensive portions of these canals are evident, appearing to interwine and, at least occasionally, anastomose ; in others, only exceedingly short sections of the canals could be discerned, possibly due to the almost complete collapse of these structures during fixation and/or processing. Post-rectal sac absent. Vulva raised on a protuberance. Vagina about 1/2 of vulval body diameter. Genital tract monodelphic, prodelphic and 134.1 ± 4.81 (103.5-163.5) µm long. Columella distinct, but the number of rows of cells not determined. Spermatheca devoid of spermatozoa, sometimes difficult to discern. Oocytes arranged in a single row within ovary. Post-vulval sac 16.2 ± 0.74 (13.0-20.5) µm long, undifferentiated. Tail conoid, with 21.4 ± 0.47 (19-24) annules (ventral side). Tail terminus smooth, with a characteristic indentation observed only in lateral view. Phasmids at 44.4 ± 1.60 (31.5-56) % of tail length.

*Males :* Not found.

TYPE HABITAT AND LOCALITY

Soil around roots of grapevine (*Vitis* sp.), Wadi Dhulail, Jordan.

TYPE SPECIMENS

Collected by the author in August, 1981 and January, 1982. Holotype female and five paratype females at Rothamsted Experimental Station, Harpenden, Hertfordshire, England. Five paratype females at Commonwealth Institute of Parasitology, St. Albans, Hertfordshire, England. Four paratype females at Muséum national d'Histoire naturelle, Laboratoire des Vers, Paris, France.

RELATIONSHIP

*Pratylenchus jordanensis* n. sp. is differentiated from previously described *Pratylenchus* species, except *P. agilis* Thorne & Malek, 1968, *P. hexincisus* Taylor & Jenkins, 1957, *P. crassi* Das & Sultana, 1979 and *P. scribneri* Steiner, 1943, by the absence of males, empty spermatheca of the female, cephalic region with two annules and slightly offset from the body, short stylet (< 18 µm), V coefficient less than 80, undifferentiated post-vulval sac (16.2 µm in length) and smooth tail terminus. It differs from the above-mentioned four species in the indentation of the tail terminus. It also differs from *P. agilis* (as described by Thorne and Malek, 1968) in its shorter stylet (14.6 *vs.* 17-18 µm) and apparently slower movements, and from *P. hexincisus* (as described by Taylor and Jenkins, 1957 and Thorne and Malek, 1968) in having four incisures on the lateral field, often with additional oblique striae in the central band at mid-body (six incisures, some of which are irregularly broken at mid-body, in *P. hexincisus*). *P. jordanensis* n. sp. is also distinguished from *P. crassi* by the shorter stylet (14.6 *vs.* 17-18 µm),

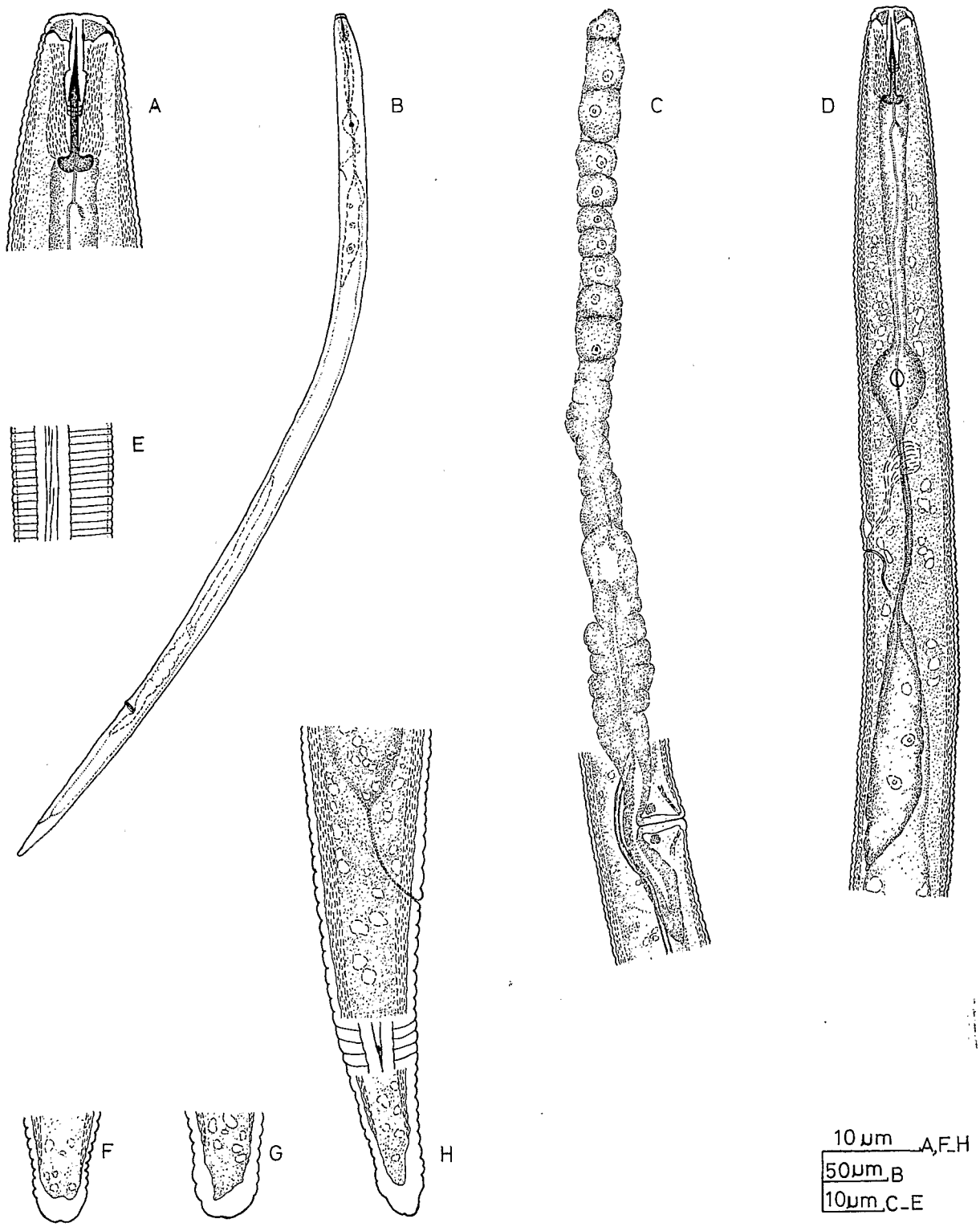


Fig. 1. *Pratylenchus jordanensis* n. sp. (paratype females). A : anterior region ; B : whole specimen ; C : reproductive system (with a portion of the intestinal fasciculi in vulval region) ; D : oesophageal region ; E : part of lateral field at mid-body ; F & G : tail termini ; H : caudal region.

the greater distance between the dorsal oesophageal gland orifice and stylet base (3.4 *vs.* 2.1 µm) and the greater number of tail annules (21 *vs.* 12-15). (According to Das and Sultana, 1979, *P. crassi* has a large oval spermatheca filled with spermatozoa ; however, this structure was not illustrated for this species and males were not found.) *P. jordanensis* n. sp. is also differentiated from *P. scribneri* (as described by Sher and Allen, 1953, Thorne and Malek, 1968 and Roman and Hirschmann, 1969) by the slightly more conoid tail with a slightly narrower terminus, the greater distance between the dorsal oesophageal gland orifice and stylet base (3.4 *vs.* 2.15 µm, the latter according to Roman and Hirschmann, 1969) and the inner incisures fusinf distally on the tail (apparently not fusing on the tail in *P. scribneri*). Eight specimens of *P. scribneri* from the USA (California), originally identified by J. Roman, were made available to the author by courtesy of D. J. Hooper. These differed from *P. jordanensis* n. sp. in the broader tail terminus which is not indented, the lower c' coefficient (2.1 (2.0-2.3) *vs.* 2.6 (2.1-3.0) ; $n = 6$) and the absence of intestinal fasciculi (1). The lateral fields were difficult to discern on the caudal region of these specimens of *P. scribneri*, so that the apparent difference in lateral field morphology between this species and *P. jordanensis* n. sp. (inner incisures fusing in this region in *P. jordanensis* but not in *P. scribneri*) could not be confirmed. Moreover, the difference in the position of the dorsal oesophageal gland orifice between the two species is perhaps too small to be of diagnostic value.

**Helicotylenchus microcephalus** Sher, 1966
(Fig. 2 A-F)

This species was found in citrus groves in the low-lying, irrigated areas of Jordan where it was reported as *H.* cf. *abunaamai* Siddiqi, 1972 (Hashim, 1979*a*). A critical re-examination of twelve specimens of these populations indicated that they belong to *H. microcephalus* because of a combination of the following characteristics : absence of males, spermathecae devoid of spermatozoa, cephalic region truncate in most specimens and invariably with four or five indistinct annules, stylet 22.3 ± 0.11 (21.5-23.0) µm long, stylet knobs with indented anterior surfaces, 0 coefficient ($n = 8$) 33.6 ± 1.04 (31-39.5), dorsally convex-conoid tail with a terminal projection of variable form and length and with 6-12 annules of approximately uniform width, phasmids situated from three annules posterior to six annules anterior to anal level and lateral fields not areolated on tail and with their inner incisures normally fusing distally on tail.

A truncate cephalic region is characteristic of *H. microcephalus* (Sher, 1966), but this was not always evident in the populations from Jordan. Instead, some specimens appeared to have a relatively rounded cephalic region (Fig. 2 A, B). A somewhat comparable variation was noted in populations of this species from the Fiji Islands in which the cephalic region, although anteriorly flattened, had rounded sides in some specimens (Van den Berg & Kirby, 1979).

The tail of *H. microcephalus* typically has a distinct ventral projection, with a pointed or hemispheroid tip (Sher, 1966). However, the form and length of this projection vary considerably between populations (Van den Berg & Heyns, 1975 ; Ali, 1976 ; yan den Berg, 1978 ; Van den Berg & Kirby, 1979). The Jordanian populations of this species mostly exhibited a relatively short tail projection (less than the width of two annules) with a rounded tip ; in some specimens it was almost indistinguishable.

*H. mangiferensis* Elmiligy, 1970 was synonymized with *H. microcephalus* by Ali (1976), but Anderson (1979) reinstated it as a valid species. The latter action appears to be justified as the consistently indistinct cephalic annulation of *H. microcephalus* contrasts strongly with the distinctly annulated cephalic region of *H. mangiferensis*, and the 0 coefficient is greater in the former species than in the latter (32-45 *vs.* 21-25, according to Sher, 1966, and Elmiligy, 1970, respectively).

**Tylenchorhynchus clarus** Allen, 1955
(Fig. 2 G-K)

*T. clarus* was originally described with anteriorly directed stylet knobs (Allen, 1955). Specimens from Egypt had flattened to anteriorly directed ones (Elmiligy, 1969). In contrast, *T. clarus* from Jordan had laterally to posteriorly inclined stylet knobs (Fig. 2 H-J), except one population from the Jubeiha area which possessed anteriorly directed knobs.

Although differently illustrated by Elmiligy (1969), the spicules of male *T. clarus* have distinct ventral flanges at their distal ends, and the gubernaculum is protrusible through the cloaca. Such features are characteristic of the subfamily Tylenchorhynchinae Eliava, 1964 (Siddiqi, 1971).

(1) The intestinal fasciculi of *P. jordanensis* do not constitute a unique character within the genus *Pratylenchus*, I have observed similar structures in *P. Goodeyi* Sher & Allen, 1953 from the Canary Islands.

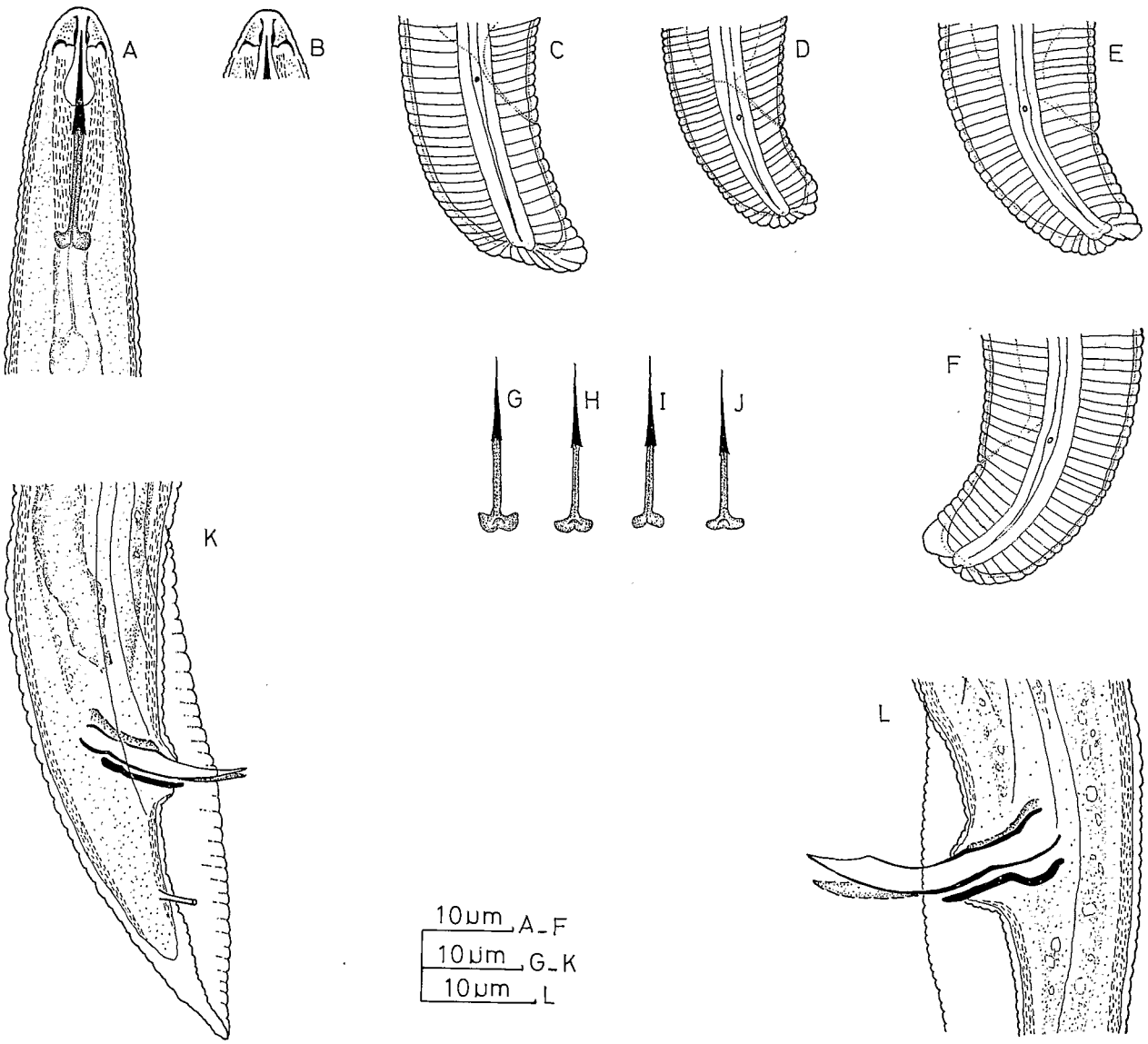


Fig. 2. *Helicotylenchus microcephalus* Sher, 1966. Female. A : anterior region ; B : cephalic region ; C-F : caudal regions. *Tylenchorhynchus clarus* Allen. 1955. Female. G-J : stylets. Male. K : caudal region. *Tylenchorhynchus goffarti* Sturhan, 1966. Male. L : cloacal region.

**Tylenchorhynchus goffarti** Sturhan, 1966
(Fig. 2 L)

The gubernaculum of male *T. goffarti* typically has a slight proximal curvature (Sturhan, 1966). However, in a population of this species from Jubeiha, the gubernaculum was sickle-shaped (Fig. 2 L). The gubernaculum shape in the original description was observed in males from other parts of the country.

Note that a few specimens identified as *T. dubius* (Bütschli, 1873) Filipjev, 1936 by Hashim (1979*a*) were re-examined and found to belong to *T. goffarti*. It is possible that all previous records of *T. dubius* in Jordan (Bridge, 1978 ; Hashim, 1979*a* & *b*) pertain to *T. goffarti*.

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