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A DESCRIPTION OF SOME JUVENILES STAGES OF *XIPHINEMA VULGARE* (NEMATODA: DORYLAIMOIDEA)

by

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Specimens of *Xiphinema vulgare* Tarjan, 1964 which has previously been reported from Java (Tarjan, 1964), were extracted from soil collected from around the roots of stunted and chlorotic *Zea mays* L. at K. P. Segunung, West Java. The specimens were heat killed, fixed in FA 4:1 and mounted in glycerine using a slow method.

Loof and Maas (1972) recorded some morphometrics of three fourth-stage juveniles which were present in a population of *X. vulgare* from Brazil but these juveniles were described only as being « *identical to that of the adult females; tail shape is also the same, though the tail is slightly longer and more slender.* » As several of the present specimens were juveniles their morphometrics and a description of the three stages observed are reported here.

Morphometrics obtained from the specimens from K. P. Segunung are given in Table I.

Description:

Females (n = 25): General morphology of the specimens observed agreed well with the description given by Tarjan (1964). The specimens had 3 to 5 caudal pores present, similar to specimens from Djakarta, Indonesia observed by Tarjan (1964). Also the morphometrics agreed with those given for populations of *X. vulgare* from Brazil, Indonesia, Surinam, the USA and Mauritius (Tarjan, 1964; Loof

Table I - *Morphometrics* of female, second-stage, third-stage and fourth-stage juveniles of* Xiphinema vulgare *from K. P. Segunung, West Java.*

		Females	Juveniles		
			L4	L3	L2
n		25	16	8	5
Body length	mm	2.49 ± 0.13 (2.24 – 2.79)	1.87 ± 0.14 (1.6 – 2.15)	1.41 ± 0.1 (1.27 – 1.6)	1.02 ± 0.05 (0.95 – 1.08)
Anterior to oesophageal intestinal junction	µm	408 ± 17.1 (374 – 455)	389 ± 22.8 (357 – 425)	317 ± 20.4) (297 – 356)	274 ± 6.5 (264 – 281)
Width at spear base	µm	36.4 ± 1.3 (34 – 40)	32.8 ± 2 (30 – 36)	29 ± 2.7 (26 – 33)	22.1 ± 1 (21 – 24)
Width greatest	µm	41.8 ± 2 (36 – 46)	35.4 ± 3.7 (31 – 42)	30.5 ± 3.4 (26 – 35)	22.4 ± 0.88 (22 – 24)
Width at anus	µm	28.3 ± 2 (25 – 35)	25.3 ± 1.3 (23 – 27)	22.4 ± 2.8 (19 – 27)	15.9 ± 0.95 (15 – 17)
Odontostyle	µm	111.3 ± 3.5 (103 – 118)	94.2 ± 2.6 (89 – 98)	77.8 ± 3.7 (76 – 86)	59.6 ± 2.6 (58 – 64)
Odontophore	µm	71.3 ± 1.9 (67 – 74)	63.8 ± 1.6 (62 – 66)	50.6 ± 6.2 (40 – 56)	45.5 ± 1.6 (44 – 47)
Spear	µm	182.6 ± 3.8 (174 – 192)	157.9 ± 3.1 (152 – 163)	128.4 ± 5.6 (119 – 132)	105.1 ± 3.6 (101 – 111)
Replacement odontostyle	µm	—	112.7 ± 3.8 (107 – 120)	92.7 ± 2.4 (90 – 96)	81.6 ± 3.6 (78 – 86)
Tail length	µm	47.5 ± 3.1 (40 – 53)	53.1 ± 5.2 (42 – 61)	61 ± 5.2 (55 – 73)	65.6 ± 3.6 (62 – 70)
Tail width at terminus of protoplasmic part	µm	12.3 ± 1.26 (11 – 14)	8.7 ± 1.16 (6.6 – 9.9)	7.5 ± 1.2 (6.6 – 8.8)	6.6 ± 0.78 (5.5 – 7.7)
Length of hyaline part	µm	17.5 ± 1.2 (16.5 – 22)	18.6 ± 2.2 (15.4 – 22)	18.7 ± 1.7 (17.6 – 21)	16 ± 1.4 (14.3 – 17.6)
Hyaline part as % of tail length	µm	37 ± 3.5 (31 – 41)	35 ± 4.2 (27 – 39)	31 ± 3 (26 – 34)	24 ± 2 (22 – 27)
a		59.6 ± 2.8 (55 – 65)	53 ± 3.3 (47 – 58)	46.4 ± 2.6 (41 – 50)	45.5 ± 3 (42 – 49)
b		6.12 ± 0.35 (5.7 – 6.9)	4.84 ± 0.59 (3.94 – 5.72)	4.33 ± 0.51 (3.57 – 4.8)	3.69 ± 0.2 (3.4 – 3.9)
c		52.7 ± 4.6 (44 – 66)	35.7 ± 5.6 (27 – 47)	23.2 ± 2.4 (20 – 27)	15.6 ± 1.5) (14 – 17)
c'		1.67 ± 0.14 (1.4 – 1.88)	2.1 ± 0.23 (1.63 – 2.44)	2.75 ± 0.34 (2.23 – 3.16)	4.17 ± 0.39 (3.7 – 4.6)
V		38.7 ± 1.2 (37 – 41)	—	—	—
S		5 ± 0.19 (4.6 – 5.5)	4.8 ± 0.28 (4.3 – 5.3)	4.5 ± 0.43 (3.7 – 5)	4.6 ± 0.15 (4.4 – 4.8)

* Mean, one standard deviation (n – 1) and range.

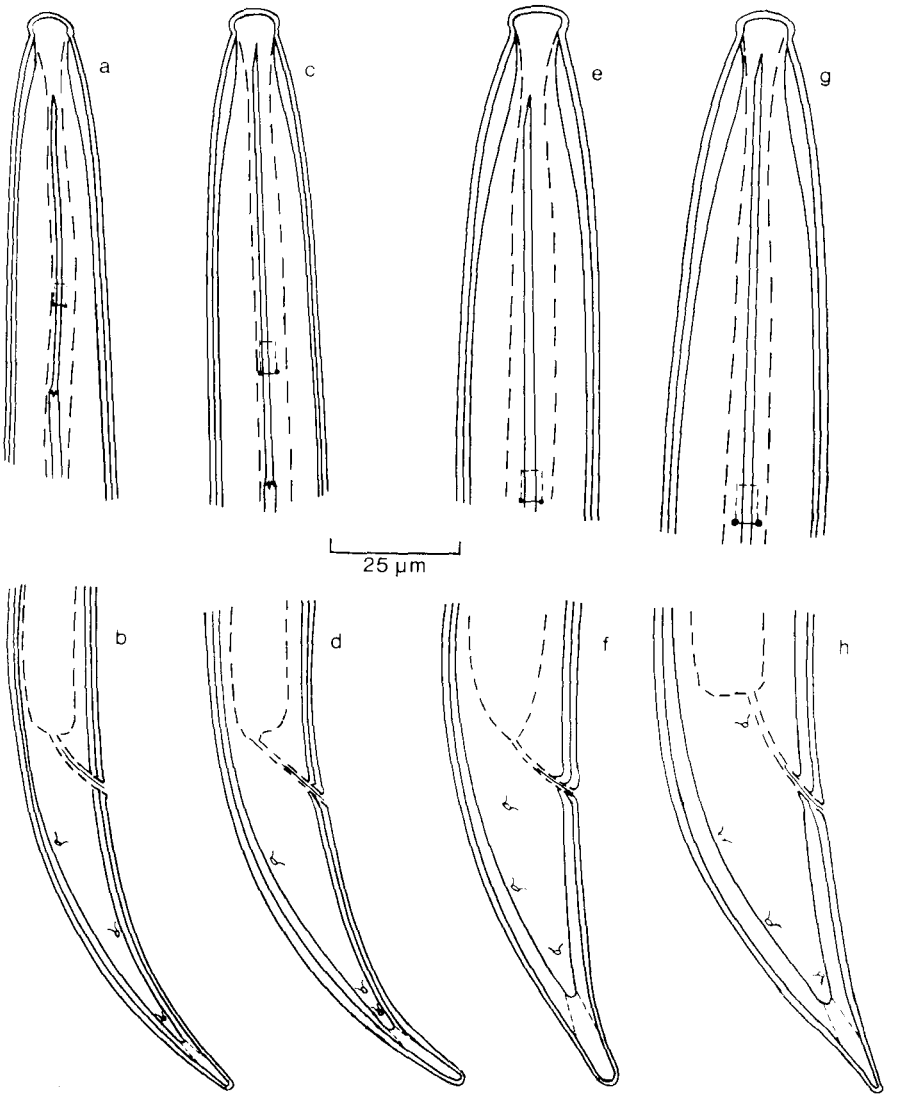

Fig. 1 - *Xiphinema vulgare*. 2nd stage juvenile head, a; tail, b; 3rd stage juvenile head, c; tail, d; 4th stage juvenile head, e; tail, f; female head, g; tail, h.

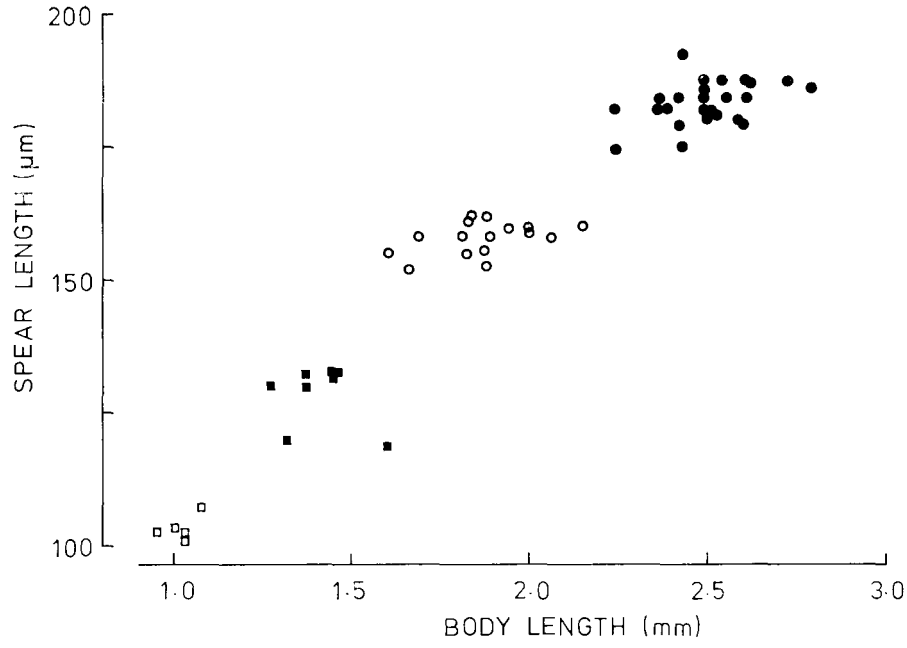

Fig. 2 - Comparison between spear length (odontostyle + odontophore) and body width in larval stages and female *Xiphinema vulgare* (□, 2nd stage juveniles; ■, 3rd stage juveniles; ○, 4th stage juveniles; ●, females).

and Maas, 1972; Williams and Luc, 1977; Loof and Sharma, 1979; Ferraz, 1980).

Juveniles (4th, n = 16; 3rd, n = 8; 2nd, n = 5): only fourth, third and second-stage juveniles were found. The three juvenile stages examined can be recognised by a progressive increase in body length and of functional and replacement odontostyle length. [Remark: although identification of the juvenile stages can be made on the basis of a single measurement (body length or length of either the functional or replacement odontostyle) identification of some specimens is aided by measuring all of these structures. However, body length and spear length (odontostyle + odontophore) enables most specimens to be readily identified (fig. 2)].

Bodies of all stages slightly ventrally curved, with more pronounced curvature in posterior region, when heat relaxed (Fig. 1). Cuticle, labial region, spear, oesophagus and intestine similar to those

of female. The mean c' value decreases with age between the different stages because of greater development in the caudal region in diameter than in length. Tail width at the terminus of the protoplasmic part increases with age whereas length of the terminal non-protoplasmic (= hyaline) portion of the tail differs only sligthly between development stages. However, the hyaline portion of the tail as a proportion of tail length increases in successive development stages.

Cohn and Sher (1972) considered *X. vulgare* to be a junior synonym of *X. setariae* Luc, 1958. However, Tarjan (1973) and Luc and Dalmasso (1975) rejected the synonymy as they believed that the two species could be differentiated on the basis of the length and structure of the tail, namely the length of the hyaline terminal portion. The information presented here confirms the homogeneity of the populations of *X. vulgare* that have been examined and may be helpful in future taxonomic revision of *X. vulgare* and *X. setariae*.

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