

## MARINE FISH NEMATODES OF PAKISTAN

### Part VIII. *Goezia pakistanica* sp. n. (Heterocheilidae) from *Parastromateus niger* (Bl) of Karachi coast

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**Abstract.** *Goezia pakistanica* (Heterocheilidae) is described from the fish *Parastromateus niger* (Bl) from West Wharf, Karachi. It is the largest among the known species of the genus and is characterized by having a typical ventriculus with a spiny valvular apparatus, tail provided with a series of circlets of backwardly directed spines, large outwardly expanded lips with well developed interlabia and two pairs of proximal oral papillae, spicules relatively large, alated and subequal, a small gubernaculum like chitinous structure, 37 pairs of pedunculate caudal papillae including 6 pairs post-anal, one-pair adanal and 30 pairs preanal. In the female the vulva is simple; the eggs are large, subglobular, and thin-shelled. From other species of the genus the new species is distinguishable mainly in having a larger body size, different sizes of spicules, eggs and different number of caudal papillae.

The nematodes of the genus *Goezia* Zeder, 1800, are known by relatively few species from different fish species in different localities; one species is also known from a reptile (see Yamaguti, 1961). Among those only five species, *G. ascaroides* (Goeze, 1782; Khan & Yaseen, 1969); *G. pseudoascaroides* (Rehana & Bilquees, 1972); *G. tunasi*; *G. chitali*; *G. heteropneusti* (Zaidi & Khan), 1975, are described from Pakistan. The former is from a marine fish and the latter four from freshwater fishes. The present one is the second species from marine fish of Pakistan. The species under study is regarded new and the name *G. pakistanica* is proposed for it.

#### Materials and Methods

Viscera of 220 fishes *Parastromateus niger* (Bl.) were purchased from the fish market, Karachi, during 1974-1975 at irregular intervals. The fishes were originally caught at West Wharf, Karachi. Together with other numerous nematodes four small stout nematodes were recovered from one fish. These four nematodes appeared to be uncommon, and therefore selected for study first. These were fixed in 70% alcohol and cleared in 70% alcohol-glycerine mixture in the ratio of 1:1. One of the nematodes was teased out under the binocular for examination of the internal structure. Diagrams are made with a camera lucida and measurements are given length by width in mm. Type specimens are preserved in the School of Parasitology, Department of Zoology, University of Karachi.

#### Description

*Goezia pakistanica* sp.n. (Fig. 1-10) Host. *Parastromateus niger* (Bl.) Stromatiidae, Location:

Intestine, Locality: West-Wharf, Karachi, Number: 2 males, 2 females from a single host; 220 hosts examined. Holotype male: SPUK-286, Allotype female: SPUK-287.

Male: Stout, brownish worms, 11.12-21.30 by 0.611-0.715. The cuticle is expanded and striated throughout the length of the body with a series of rings provided posteriorly with backwardly directed spines. The edges of these cuticular rings are further provided with very narrow and feeble cuticular striations. The thickness of cuticle is 0.091-0.260. Head 0.195-0.26 in dia. surrounded by three large lips flattened and expanded outwards with large granulated protoplasmic sheet and separated from rest of the body by a constriction, each 0.208-0.221 by 0.156-0.182 in size and provided with two pairs of prominent papillae. The lips are without dentigerous ridges but the cuticle of the internal surface of lips is produced into tooth-like structures. Interlabia present with well marked grooves running from interlabia to the base of the lips. Interlabia 0.065-0.104 by 0.05. Cephalic alae 0.260 by 0.091, also retaining granulated protoplasmic cells. The nerve ring lies at a distance of 0.715-0.910 from the anterior extremity. Esophagus highly muscular 2.535-2.665 by 0.195-0.286, narrow in the middle and swollen posteriorly, provided with a ventriculus, 0.338 by 0.182, posteriorly giving off a long single ventricular appendage approximately 0.715 by 0.091 and anteriorly a short forwardly directed intestinal cecum 0.445 by 0.140. Tail conical, 0.195-0.20 in length and terminating into an appendage with a series of circlets of spines. Spicules subequal, chitinized, and alate, 1.781 and 1.872 mm in length. A small accessory chitinized

piece similar to gubernaculum is also present, pre-anal in position between the first and second pair of preanal papillae. Caudal papillae are pedunculate, 37 pairs including 6 pairs small post-anal, 1 pair adanal and 30 pairs preanal.

Female : Larger than the male. 26.25-37.29 by 0.60-0.78. Cuticle thick and striated throughout the length of the body with a series of annulations with outwardly directed edges. The thickness of cuticle is 0.026. Head dia. 0.234-0.299, lips large 0.26-0.27 by 0.15-0.2. Interlabia distinct 0.091 by 0.078. Esophagus 3.185-6.5 by 0.338 followed by a large ventriculus 0.338 by 0.26 and similar to that of male in structure. Anteriorly a short intestinal cecum measuring 0.585 by 0.195 given off from the ventriculus and posteriorly a ventricular appendage measuring approximately 2.15 by 0.230. Nerve ring not distinct. Tail abruptly conical possessing two pairs of large papillae. Tip of the tail armed with circlets of spines. The eggs are thin shelled, globular to elongate, 0.039-0.065 by 0.039-0.042 in size.

## Discussion

The genus, *Goezia* Zeder, 1800, is known from species from different fish hosts and locality and also in reptiles (Yamaguti, 1961). Among these only five species of the genus, *Goezia* Zeder, 1800, are described from Pakistan; *G. ascaroides* (Goeze, 1782 Khan & Yaseen, 1969) in *Thrissocles hamiltoni* and *G. pseudoascaroides* (Rehana & Bilquees, 1972) in *Mastacembelus pancalus*. The present species from *Parastromateus niger* (Bl.) is the largest among the known species of the genus and is distinct from *G. ascaroides* and *G. pseudoascaroides*, *G. taunsa*, *G. heteropneusti*. The present species, *G. pakistanica* sp. n. differs from *G. ascaroides* in having a peculiar structure of the ventriculus, different size of intestinal cecum, ventricular appendix, lips and interlabia, spicules, eggs and number of oral papillae, caudal papillae and the position of the vulva. Although slight resemblance is found in the two species in gross appearance, body size and ventriculus diameter, *G. pseudoascaroides* is differentiated from the present

TABLE 1. MORPHOLOGICAL VARIATIONS AMONG THE SPECIES OF THE GENUS *GOEZIA* ZEDER, 1800, REPORTED FROM PAKISTAN.

Host Type Locality Species.	<i>Thrissocles hamiltonii</i> Khulna (Bangladesh)		<i>Mastacembelus pancalus</i> (Ham) Kalri lake (Pakistan)		<i>Parastromateus niger</i> (Bl.) Karachi coast (Pakistan)	
	<i>Goezia ascaroides</i> (Goeze, 1782) (Khan & Yaseen, 1969)		<i>Goezia pseudoascaroides</i> (Rehana & Bilquees, 1972)		<i>Goezia pakistanica</i> sp. n.	
	Male	Female	Male	Female	Male	Female
Body size	10.53-23.22 × 0.15- 0.67	27. 0-30.37 × 0.64- 0.73	3.65-4.56 × 0.49-0.51	3.78-7.89 × 0.68-0.92	11.12-21.30 × 0.611- 0.715	26. 25-37. 29 × 0. 60- 0. 73
Lip size (dia.)	0.04- 0.05	0.06- 0.08	0.02-0.02	0.02-0.05	0.208- 0.221 ×	0. 26- 0.373 ×
Esophagus Size	1.78-3.10 × 0.05-0.13	3.10-3.37 × 0.13-0.14	0.55-0.59 × 0.12-0.18	0.43-0.88 × 0.14-0.29	2.535- 2.665 0.195- 0.286	3.185- 4.355 0.338- 0.338
Size of ventriculus	0.13-0.20	0.09-0.10 × 0.10	..	0.77 × 0.13	0.338 × 0.182	0.338..0.26
Intestinal cecum size	0.06-1.2	1.30-1.40	—	1.05 in length	0.445 × 0.104	0.585..0.195
Ventricular appendix size	2.56-4.32 × 0.08-0.09	5.2-5.5 × 0.09	..	—	0.715 × 0.091	1.859..0.230
Specule size : Longer	1.30-2.02 × 0.02-0.04		0.34-0.41 × 0.02-0.02		1.872 × 0.065	
Shorter	1.20-1.90 × 0.02-0.04		0.15-0.09 × 0.01-0.01		1.781 × 0.05	
Number of caudal papillae	(14 pairs); 9 preanal 2 adanal 3 postanal		(31 pairs) 29 preanal — 2 postanal		(37 pairs) 30 preanal 1 adanal 6 postanal	
Position of vulva	—	8.0 from ant. end.	—	1.21-1.95	—	18.42 from ant. end.
Egg size		0.03-0.04 × 0.04-0.05	—	0.02-0.03 × 0.02-0.02		0.039-0.069 × 0.039-0.042
Tail length	0.06- 0.09	0.23-0.25	0.11-0.14	0.14-0.22	0.195	0.29

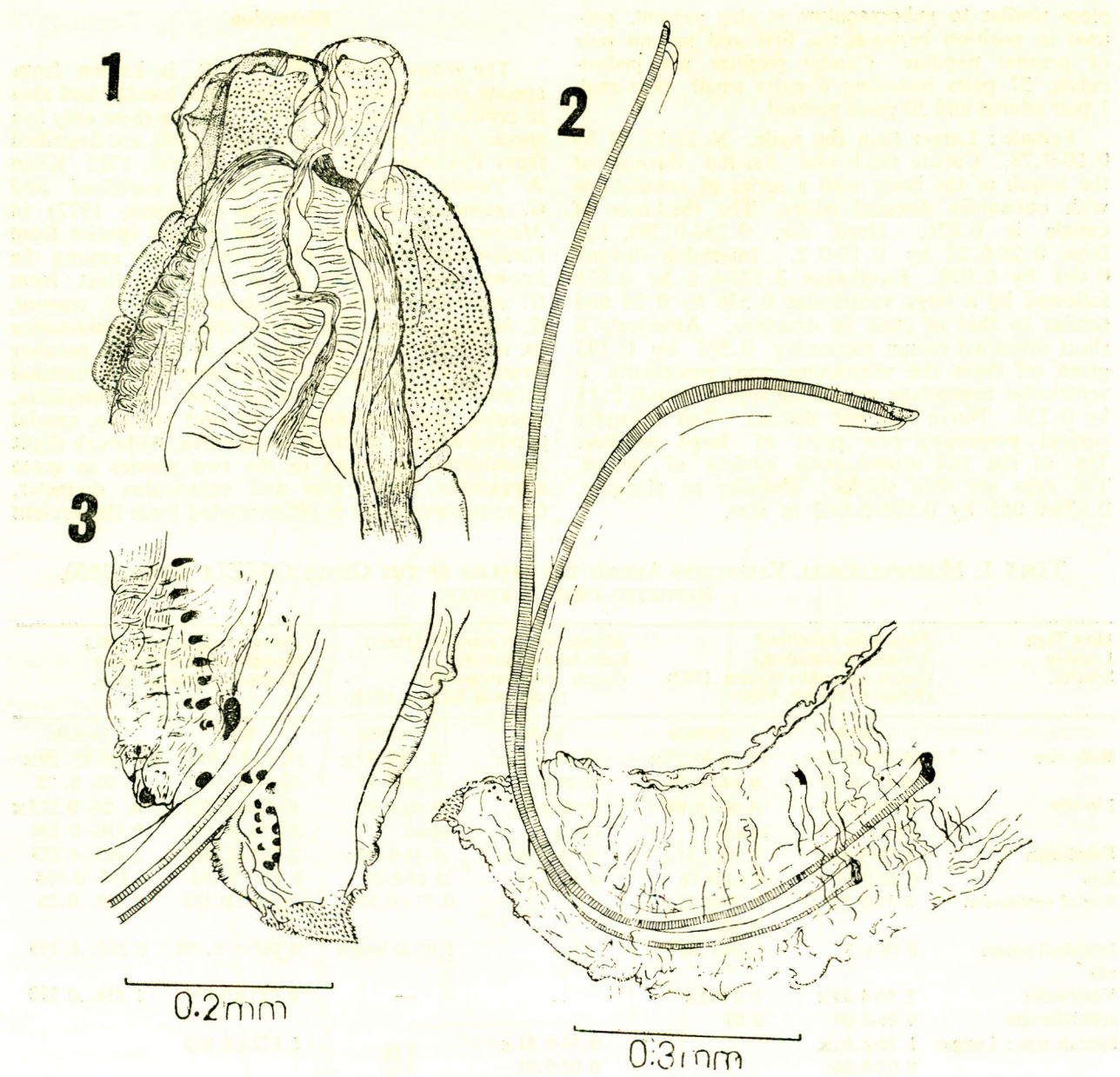


Fig. 1-3. *Goezia pakistanica* Male, holotype.

1. Head end with part of esophagus.
2. Posterior region showing spicules.
3. Tail end showing circlet of spines.

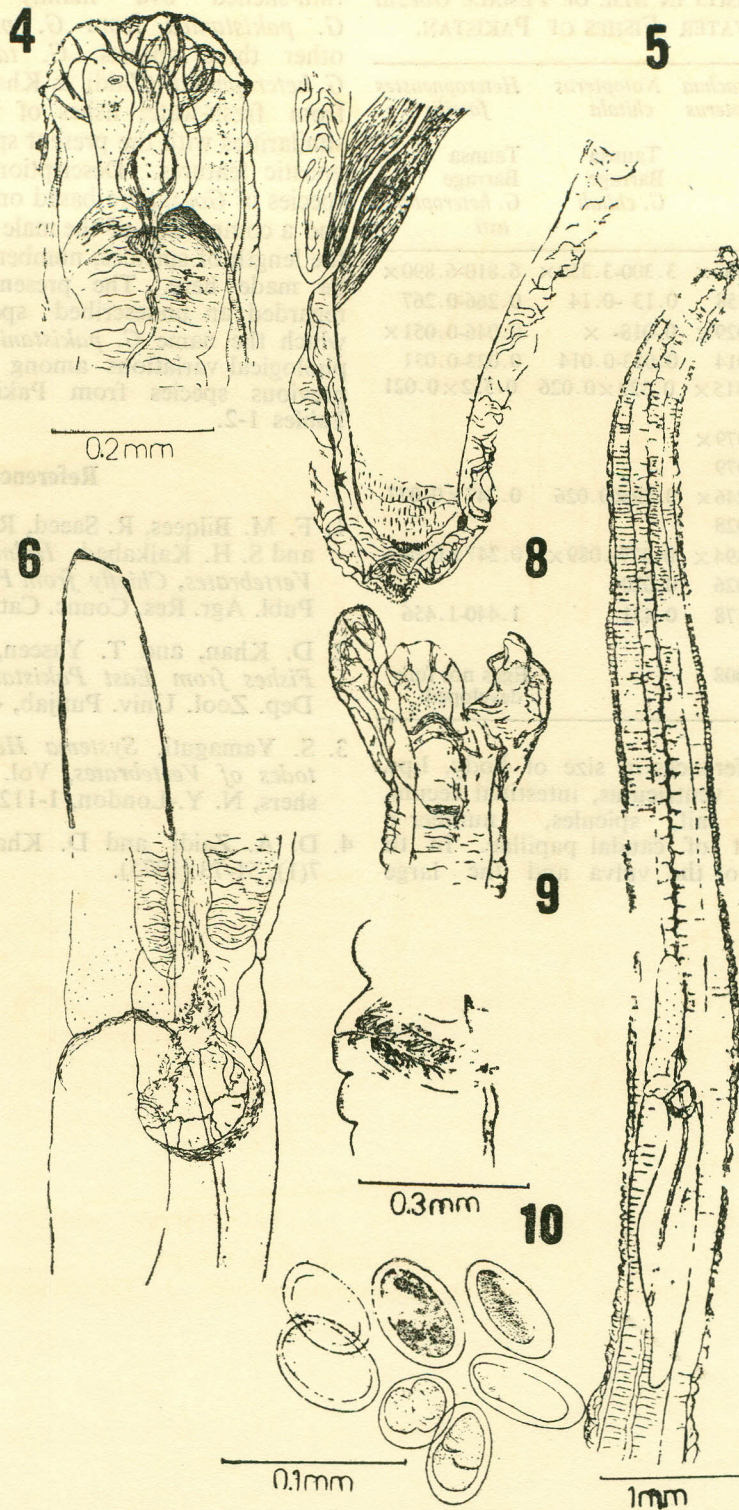


Fig. 4-10. *Goezia pakistanica*, female, allotype.

4. Head end with part of esophagus. 5. Posterior region. 6. Ventriculus and associated structures. 7. Anterior region showing complete esophagus, ventriculus, intestinal cecum and ventricular appendix. 8. Head end showing the position of lips in a pressed specimen. 9. Region of vulva. 10. Eggs.

TABLE 2. MEASUREMENTS IN MM. OF FEMALE *Goezia* SP. FROM FRESHWATER FISHES OF PAKISTAN.

Host type	<i>Channa gachua</i> and <i>Notopterus</i> <i>chitala</i> .	<i>Notopterus</i> <i>chitala</i>	<i>Heteropneustes</i> <i>fossilis</i>
Locality	Taunsa Barrage	Taunsa Barrage	Taunsa Barrage
Species	<i>G. taunsi</i>	<i>G. chitali</i>	<i>G. heteropneusti</i>
Body size	3.450-4.408 × 0.138-0.158	3.300-3.350 × 0.13 -0.14	6.810-6.890 × 0.266-0.267
Lip size	0.018-0.029 × 0.013-0.014	0.018- × 0.013-0.014	0.046-0.051 × 0.023-0.031
Esophagus size	0.216-0.315 × 0.026	0.329 × 0.026	0.552 × 0.021
Size of ventriculus	0.038-0.079 × 0.038-0.079		
Intestinal cecum	0.197-0.246 × 0.026-0.028	0.89 × 0.026	0.247 × 0.077
Ventricular appendix size	0.335-0.394 × 0.02 -0.026	0.077-.089 × 0.020	0.247 × 0.043
Vulva from ant. end	0.166-0.178	0.421	1.440-1.456
Egg size	0.005-0.008		Eggs not fully developed.

species in having differences in size of body, lips, interlabia, esophagus, ventriculus, intestinal cecum, ventricular appendix, tail, spicules, number e and the arrangement of caudal papillae. In th female the position of the vulva and the large

thin-shelled ova mainly serve to distinguish *G. pakistanica* from *G. pseudoascaroides*. The other three species, *G. taunsi*, *G. chitali* and *G. heteropneusti* (Zaidi & Khan, 1975), are described from fresh-water fishes of Pakistan and have no similarities with the present species in any of the diagnostic features. Descriptions of these fresh-water species of *Goezia* are based on female specimens only and a comparison of the male diagnostic features, e.g. the length of spicules, number of papillae etc. cannot be made here. The present species is, therefore, regarded an undescribed species of the genus for which the name *G. pakistanica* is proposed. Morphological variations among the new species and previous species from Pakistan are shown in Tables 1-2.

#### References

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