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# ULTRA STRUCTURE STUDY AND REDESCRIPTION OF PALLISENTIS MAGNUM SAEED AND BILQEES, 1971

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## ABSTRACT

A redescription of *Pallisentis magnum* Saeed and Bilqees, 1971 is given with surface ultrastructure of the proboscis and the spines. Variations were observed in (1) number of proboscis spines (2) length of proboscis spines (3) number and row of collar spines (4) length of proboscis receptacle, and (5) length of bursa. Ultrastructure studies showed that the cuticle on proboscis is smooth and at the base of each spine there is a swellig of cuticle which is regarded a functional and protective structural modification.

## INTRODUCTION

*Pallisentis magnum* Saeed and Bilqees, 1971 was originally reported from *Wallago attu* of Kalri Lake.

Once again this species is being reported from the same host and locality. But previously the description was not given in detail. At present, a complete description of the species with variations is being given with surface ultrastructure of the proboscis and the spines.

## MATERIALS AND METHODS

Two female and nine male specimens were recovered from *Wallago attu* of Kalri Lake. Two male specimens were used here for study under scanning electron microscope. For the study of surface ultrastructure the live specimens were fixed in cold 4% glutaraldehyde in buffer (7.2) for 24 hours. Then dehydrated, dried, mounted on stubs and coated with gold as described previously (Bilqees, 1976 & 1977) and examined under a scanning microscope. Photomicrographs were prepared by the courtesy of Natural History Museum, London,

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during a visit to U. K. Diagrams were made with the help of a microprojector and camera Lucida. Measurements are given length by width in millimeters. The slides are deposited in Parasitology Section, Department of Zoology, University of Karachi.

## DESCRIPTION

The specimens were creamy white in colour when alive. Body is large, slender and tubular. The males measure 9.78-20.82 by 0.78-1.05. The proboscis is short, globular, broader at tip and progressively becoming narrow at the base where the smaller spines are situated as seen in Fig. A. In enface view it appears octagonal because of prominent bulging at the base of spines. At the tip of the proboscis there is a muscular pad to which the bases of the spines are attached. This structure is obvious in permanent mounts under the light microscope. The proboscis measures 0.21-0.25 by 0.33-0.39 mm. The proboscis bears 4 rows of spines each row has 8 spines as seen in Fig. A. The spines of the first row are large curved ventrally with pointed ends and measure 0 063-0.082 by 0.012-0.020 mm. At the base of each spine there is a swelling as also seen by ultrastructure study.

The spines of second, third and fourth row are smaller than the first and measuse 0.045-0.050 by .0072-.0079mm. Neck is apparently smooth and measures 0.21-0.23 by 0.27-0 33mm. The collar has 15 rows of spines each row has 20 spines which are small, pointed and broad at the base measuring 0.027-0.039 by 0.010-0.014 mm. The base of collar spines appears deeply embedded in the cuticle as seen in Fig. B. On the anterior half of the body, rows of spines are present; each row has 14-18 spines. The body spines are more or less similar to collar spines. Proboscis sheath measures 0.66-1.44 by 0.33-0.50 mm. Lemnisci measure 1.24-1.59 by 0.077-0.079 mm.

The testes are two in number, syncytial and oval in shape. The anterior testis measures 0.68-1.61 by 0.17-0.42 mm, while the posterior testis measures 0.66-1 30 by 0.21-0.43 mm. Cement gland is elongate, large and measures 0.92-3.35 by 0.13-0.34 mm. The cement reservoir measures 0.44-1.98 by 0.17-0 34 mm and is somewhat pear-shaped. The Saeftigens pouch measures 0.44-1.18 by 0.052-0.130. The vesicula seminalis measures 0.42-0.97 by 0.052-0.130. mm.

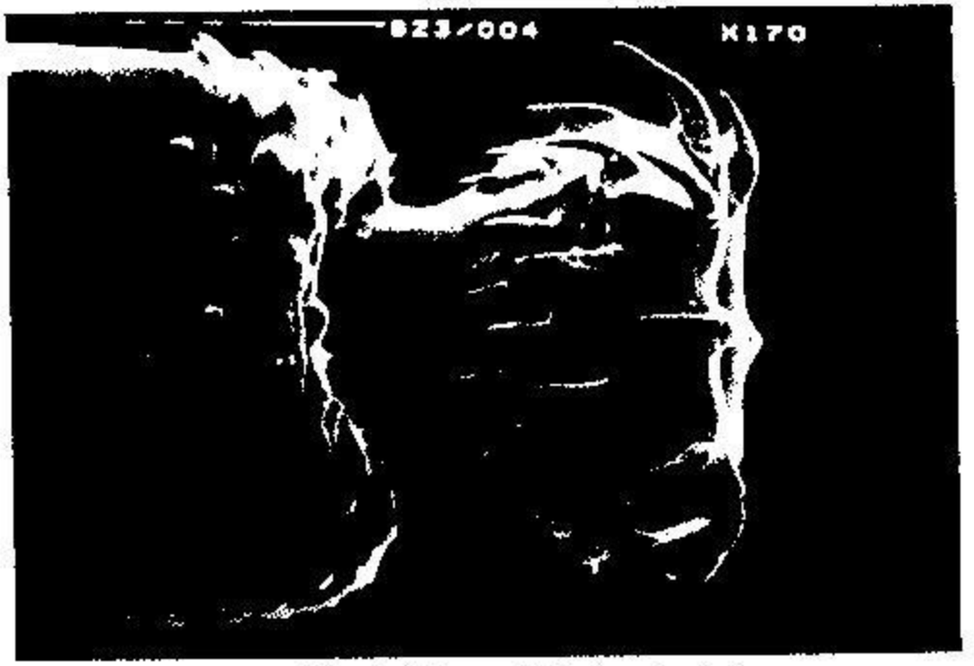
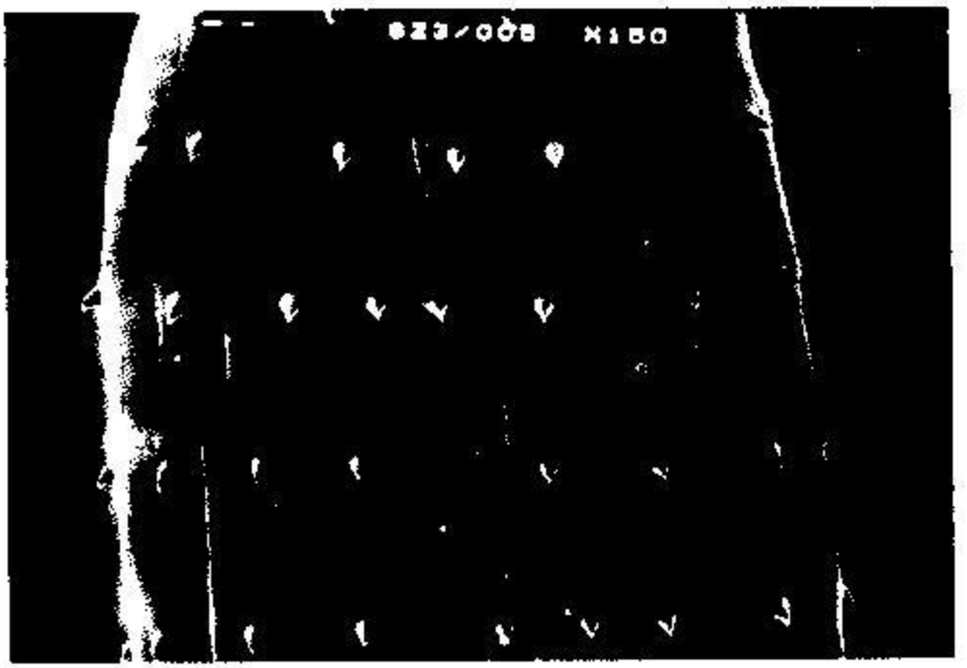



Fig. A. Collar partially invaginated.

Fig. B. Body spines of the same specimens.



*Pallisentis Magnum Saeed and Bilqees, 1971*

Bursa is variable in shape and size depending on the state of protrusion, measuring 0.06-0.36 by 0.11-0.42 mm.

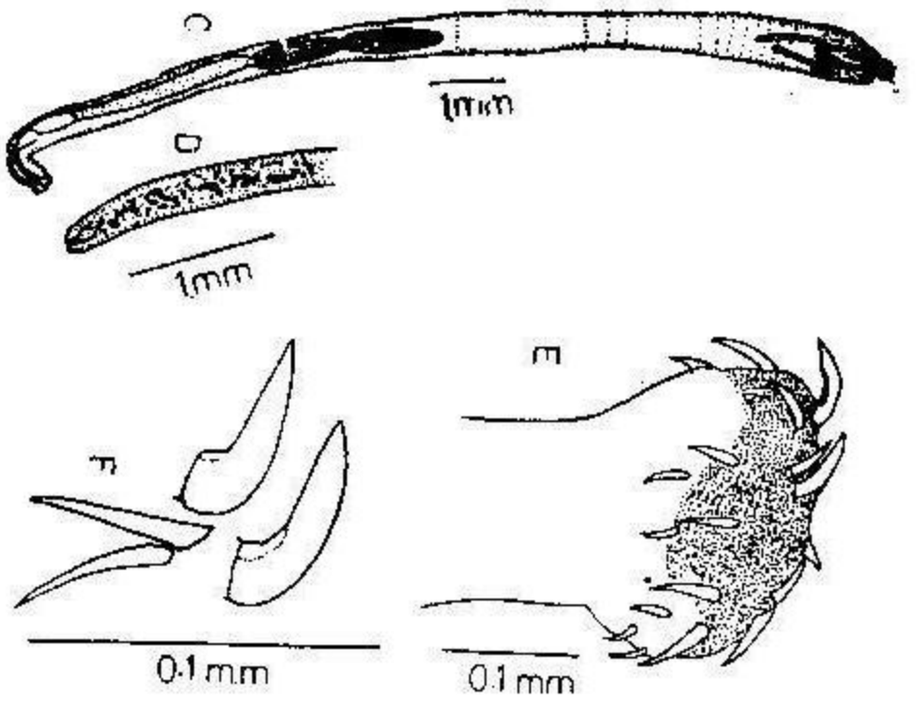



Fig. C. Entire male; Fig. D. Posterior end of female;
Fig. E. Proboscis; Fig. F. Proboscis spines (enlarged).

The female measures 11.73-12.94 by 0.70-0.74 mm. Proboscis is subcylindrical measuring 0.19-0.23 by 0.35-0.39 mm followed by smooth neck, 0.38-0.39 by 0.23-0.29 in size. The number of spines, rows and size of spines in male and female seems to be similar. The proboscis sheath or receptacle measures 0. 54-0.78 by 0.23-0.35 mm. No eggs were observed. Ovarian masses were present throughout the body and measured 0.025-0.051 by 0.025-0 038 mm. Uterine bell measures 0.081-0.076 by 0.072-0.076 mm. The vagina measures 0.038-0.048 by 0.028-0.038 mm. The posterior end of female is rounded. The genital opening is terminal.

## DISCUSSION

The species of genus *Pallisentis* reported by now are *P. allahabadii* Agarwal, 1958; *P. magnum* Saeed and Bilqees, 1971; *P. basiri* Farooqi, 1958; *P. cleatus* (Van Cleave, 1928) Harada, 1935; *P. colisai* Sarkar 1956; *P. gaboes* (MacCallum, 1918) Van Cleave, 1928; *P. nandai* Sarkar, 1953; *P. nagpurensis* Bhalerao, 1931 and *P. ophiocephali* (Thapar, 1930).

The species of genus *Pallisentis* reported from Pakistan are *P. ophiocephali* (Thapar, 1930) Saeed and Bilqees, 1972 and *P. magnum* Saeed & Bilqees, 1971. The only species reported in this genus from *Wallago attu* is *P. magnum*. The present specimens are also from the same host. They have similar diagnostic features but variations in certain characters are noted which are as given below :

1) The number of proboscis spines in *P. magnum* (Saeed and Bilqees, 1971) is 28-30, while in the present specimens of the same species their are 32 spines.
2) The length of proboscis spines in *P. magnum* (Saeed and Bilqees, 1971) is 0.028-0.320, while in the present specimens they are larger and measure 0.045-0.0360 mm.
3) The collar spines in *P. magnum* consists of 16 rows of 10 spines each, while in the present specimens the collar has 15 rows of 20 spines.
4) In present specimens maximum length of proboscis receptacle is 1 44, while in *P. magnum* reported by Saeed and Bilqees, 1971 it was 1.20 mm.
5) The length of bursa is 0.060 to 0.36 mm which is smaller than reported earlier (0 40-0.70 mm).

Ultrastructure studies of the specimens revealed that the proboscis has a smooth cuticle and the swelling at the base of the spines probably has the same function of protection of spines as the folded cuticle in *Serrasentis longus* (Bilqees, 1971).

The present specimens of *Pallisentis magnum* are similar to *P. nandai* in the shape and number of proboscis is spines but is differentiated in the number of rows of collar spines, which in *P. magnum* are 15 rows while in *P. nandai* there are 14 rows. Similarly, the width of proboscis sheet in *P. magnum* is wider than

in *P. nandai*.

Even the size of female of *P. nandai* (6.3 to 10.4 mm) as compared to *P. magnum* (11.73 to 12.94 mm) is small.

*P. nagpurensis* has ten oblique rows of spines on proboscis. The collar in *P. nagpurensis* has 12-14 rows of spines which is different from *P. magnum*. In *P. gaboes* the proboscis has 4 circles each of 10-12 spines. *P. basiri* has 4 circles each of 9 spines, and in this respect, is different from *P. magnum* which has 4 rows having 8 spines each.

*P. nagpurensis* measures 0.64-0.75 by 0.11-0.17 and 0.500-0.075 by 0.12-0.17 which is smaller as compared to *P. magnum*, measuring 0.68-1.61 by 0.17-0.42 and 0.66-1.30 by 0.21-0.43, mm respectively.

Cement gland in *P. nagpurensis* mersures 0.52-1.28 by 0.11-0.12 mm, while in *P. magnum* it measures 0.92-3.35 by 0.130-.034 mm. Cement reservoir in *P. nagpurensis* measures 0.25-0.42 by 0.11-0.12, while in *P. magnum* it measures 0.44-1.98 by 0.12-0.34 mm. *P. ophiocephali* (5.5 to 6.0 mm), *P. allahabadii* (2.85-5.70 mm), *P. coliasi* male (3.5 to 8.5 mm) and *P. basiri* (8.28 mm) are smaller than *P. magnum* (9.78-20.82 by 0.78-1.05 mm). While *P. cleatus* female (17 mm) is bigger and *P. basiri* (8.28 mm) is smaller than *P. magnum* (11.73-12.94 by 0.70-0.74 mm). In *P. allahabadii* eggs measure, 0.020-0.070 x 0.012-0.028; in *P. cleatus*, .053-.077 x .020-.027, while in *P. magnum* Saeed and Bilqees, 1971 they measured 0.018-0.042 x 0.021-0.025 mm. No eggs were observed in the present specimens although numerous ovarian masses were present.

Superficially, the present specimens appear different from *P. magnum* Saeed and Bilqees, 1971 from the same host. But as Saeed & Bilqees, 1971 have not given a detailed description and did not mention the variation within this species, the present specimens are identified as the same species showing morphological variations. Studies on the ultrastructure of this species also verify the variations observed under light microscope.

Diagnosis of *P. magnum* (Saeed & Bilqees, 1971) emended

Body size (male), 6.40-20.82 x 0.36-1.05 mm; body size (female), 6.40-40.00 x 0.36-1.10 mm; proboscis, 0.21-0.32 x 0.16-0.39 mm, length of proboscis spines, 0.028-0.082 mm; testes, 0.40-1.61 x 0.10-1.61 mm; cement gland, 0.40-

3.50 x 0.12-0.34 mm; cement reservoir, 0.40-1.98 x 0.16-0.34 mm; seminal vesicle, 0.140-0.097 x 0.11-0.97 mm; vesicula seminalis, 0.42-0.97 x 0 052-0.13 mm; bursa, 0.36-0.70 x 0.11-0.42 mm.

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