

**PALLISENTIS MUNIFI SP.N. (ACANTHOCEPHALA: QUADRIGYRIDAE) IN A FRESHWATER FISH MRIGAL CARP (*CIRRHINUS MRIGALA* HAMILTON, 1822) OF KALRI LAKE, SINDH, PAKISTAN**

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**ABSTRACT**

A new thorny headed worm, *Pallisentis munifi* n.sp. is described here from the small intestine of freshwater fish, mrigal carp (*Cirrhinus mrigala* Hamilton, 1822). The new species is characterized by possessing curved medium size body, proboscis small, cylindrical to globular, proboscis having 4 circle of hooks each having six hooks, proboscis receptacle cylindrical to saccate with single layered muscular wall reaching to second row of collar spines. Collar spines in 14-15 rows. Body spines having 54-56 rows of spines. Lemnisci long, unequal; Testes cylindrical the anterior smaller as compared to posterior; cement gland long, cylindrical containing a number of nuclei; bursa well developed and eggs numerous, oval to elongated.

**Keywords:** Acanthocephala, freshwater, *Cirrhinus mrigala*, Kalri Lake, Pakistan

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**INTRODUCTION**

The mrigal carp (*Cirrhinus mrigala* Hamilton, 1822) also known as the white carp is a species of ray-finned fish and is a plankton feeder. It is a popular food fish and an important aquacultured freshwater species throughout South Asia (de Graff and Latif, 2002). In order to increase profitability, health care based on knowledge of fish parasites is pre-requisite for rapid diagnosis and control of disease (Ramudu *et al.*, 2013). Therefore, in the present study a new acanthocephalan parasite *Pallisentis munifi* n.sp. is being reported from mrigal carp (*Cirrhinus mrigala*) from Kalri Lake, Sindh, Pakistan.

**MATERIALS AND METHODS**

The fish were caught from Kalri Lake, Thatta, Sindh, Pakistan and brought to the laboratory for examining parasites. Two male and two female were recovered from the small intestine of a fish. The specimens were flattened by pressing them between two slides and tying these slides with white cotton thread by applying adequate pressure which may not cause any damage to the specimens for 24 hours in F.A.A. solution (a solution of ethyl alcohol, formalin, acetic acid in the ratio of 92:5:3). Later washed with 70% alcohol, stained with Mayers carmalum, dehydrated in graded alcohol, cleared in clove oil, rinsed with xylene and mounted permanently in Canada balsam. Drawings were prepared with camera lucida. Measurements are in millimetres. The specimens are deposited in Aquaculture and Fisheries Program, Animal Science Institute, National Agricultural Research Centre (NARC), Islamabad, Pakistan.

***Pallisentis munifi* sp. n.**

(Figs. 1a-h)

Host: Fish (*Cirrhinus mrigala* (Ham.)  
Location: Intestine  
Locality: Kalri Lake, Sindh, Pakistan  
No. of specimens recovered: Two male and two female from 1 host  
No. of hosts examined: 14

**Male**

Body curved, medium in size 6.45-7.09 by 0.38-0.42. Proboscis small, cylindrical to globular, 0.15 by 0.15-0.16 in size with 4 circles of hooks each bearing 6 hooks. The first row of hooks measure 0.083-0.087 by 0.0228-

0.0247; the second row of hooks measures 0.0646–0.0808 by 0.0076–0.0091, the third row measures 0.046 by 0.0076–0.0079 and the last row of hooks measure 0.0301 by 0.0068–0.0076. Neck measures 0.10–0.19 by 0.10–0.15. Proboscis receptacle cylindrical to saccate with single layered, muscular wall reaching to second row of collar of spines measuring 0.63–0.64 by 0.16. Collar spines in 14–15 rows. Collar row spines are at a distance of 0.10. Body spines having 54–56 rows of spines at a distance of 0.15–0.18. Lemnisci long, unequal, cylindrical, slender the left measuring 0.93–0.96 by 0.063, the right testes 0.84–0.86 by 0.15–0.16. Testes cylindrical, contiguous slightly overlapping in some specimens, the anterior is 0.78 by 0.89 by 0.15–0.16, while the posterior is 0.84–0.86 by 0.15–0.16. Cement gland long, cylindrical containing a number of nuclei measuring 0.60 by 0.19–0.21. Cement reservoir 0.62–0.82 by 0.21–0.22. Safftigens pouch 0.45 by 0.20–0.21. Bursa well developed 0.46–0.51 by 0.14–0.15.

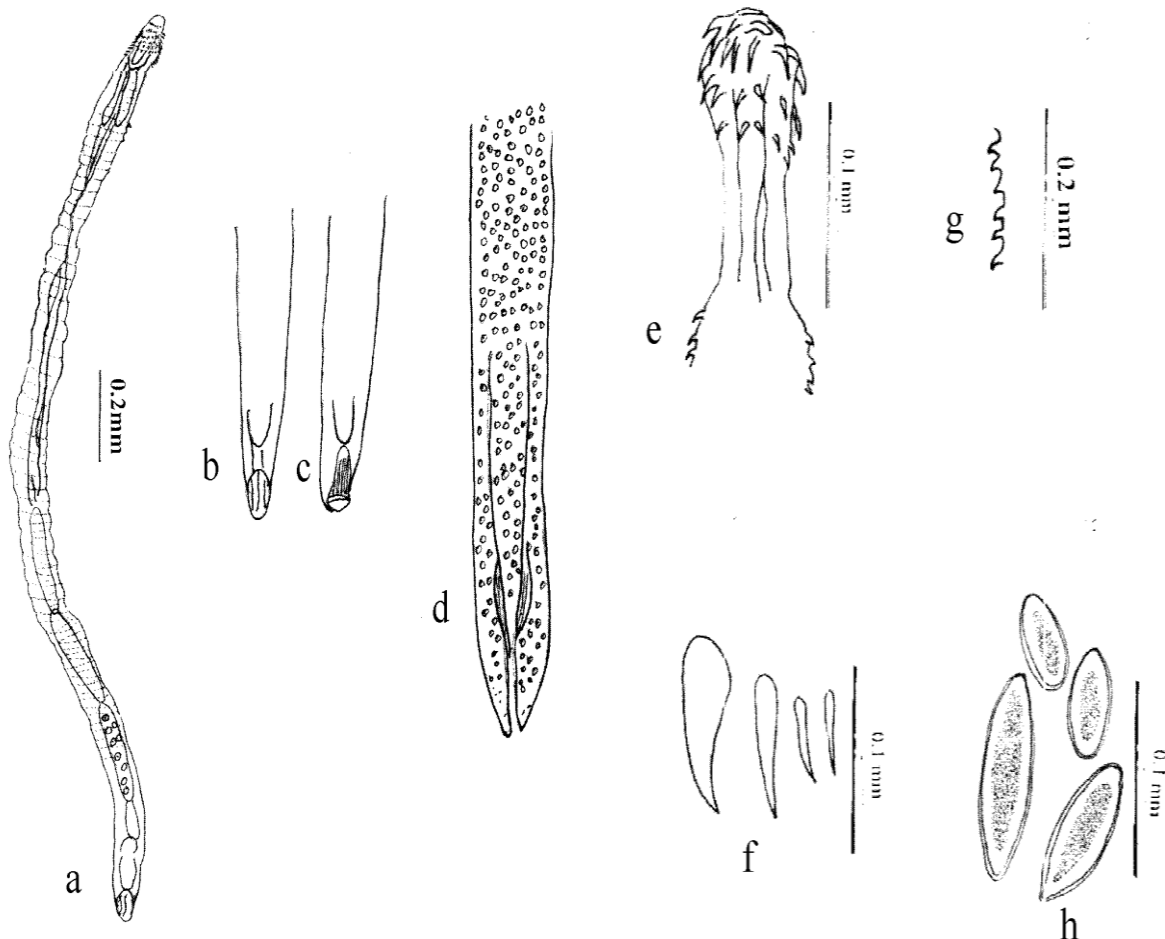


Fig. 1. *Pallisentis munifi* new species.

a = Entire male specimen; b and c = Variation in bursa; d = Posterior end of female; e = Proboscis enlarged; f = Hooks enlarged; g = Row of collar spines; h = Eggs.

### Female

Curved, longer than the male specimens measuring 7.20–7.36 by 0.39–0.42. Proboscis small cylindrical to globular measuring 0.15–0.17 by 0.16. The number and size of hooks are similar to male specimens. Neck measures 0.195–0.25 by 0.105–0.151. Proboscis receptacle cylindrical to saccate with single layered muscular wall measuring 0.144–0.45 by 0.20–0.22. Lemnisci long cylindrical, slender, unequal, longer than the proboscis receptacle the left measuring 0.75 by 0.06–0.07 and the right measuring 0.63 by 0.07. Eggs numerous, oval to elongated measuring 0.045–0.068 by 0.024–0.028.

## DISCUSSION

Van Cleave (1928) described *P. umbellatus* from *Ophiocephalus argus*, *Siniperca chua-tsi*, *Cohitis decemcirrosus*, *Parasilusis asotus* sp. from China. Golvan (1959) divided the genus *Pallisentis* into three sub-generic categories namely *Pallisentis* (*Pallisentis*), *Pallisentis* (*Neosentis*) and *Pallisentis* (*Farzandia*) on the basis of number of hooks in each circle of proboscis. Yamaguti (1963) did not accept the classification of Golvan (1959) without giving any reason. Later Amin *et al.*, (2000) created three subgenus of *Pallisentis* namely *Brevitritospinus* Amin *et al.*, 2000; *Demidueterospinus* Amin *et al.*, 2000 and *Pallisentis* Van Cleave 1926 (*Sensu stricto*). The subgenus were based on following characters *Brevitritospinus* having posterior hooks about half as long as middle hooks; *Demidueterospinus* (middle hooks about half as long as anterior hooks and *Pallisentis* (hooks gradually decrease in size posteriorly). According to Amin (2013) the valid species of subgenus *Pallisentis* are the following, *P. (P.) celatus* (Van Cleave 1928) Baylis, 1933; *P. (P.) cholodkowskyi* (Kostylew, 1928) Amin, 1985; *P. (P.) hongquinnensis* Liu et Zhang, 1933; *P. (P.) colisai* Sarkar, 1954; *P. (P.) clupei* Gupta et Gupta, 1980; *P. (P.) goboies* (MacCallum, 1918) Van Cleave, 1928. *P. (P.) garuai* (Sahay et al., 1971) Jain et Gupta, 1979; *P. (P.) gomtii* Gupta et Verma, 1980; *P. (P.) guptai* Gupta et Fatma, 1989; *P. (P.) jagani* Koul *et al.*, 1992; *P. (P.) kalriai* Khan et Bilqees, 1985 *P. (P.) magnum* Saeed et Bilqees, 1971; *P. (P.) nagpuresnsis* (Bhalerao, 1931) Baylis, 1931, *P. (P.) nandai* Sarkar, 1959; *P. (P.) pesteri* (Tadrus, 1966) Chowhan *et al.*, 1987; *P. (P.) rexa* Wongkham et Whitfield, 1999; *P. (P.) sindensis* Khan et Bilqees, 1987; *P. (P.) umbellatus* Van Cleave 1928 (type species) and *P. (P.) usuriense* (Kostylew, 1941) Golvan, 1959.

The species reported from Pakistani fresh water fish are *P. (P.) kalriai* Khan et Bilqees, 1985; *P. (P.) sindensis* Khan et Bilqees, 1987 and *P. magnum* Saeed et Bilqees, 1971.

The present specimens appear to be close to *P. umbellatus* Van Cleave, 1928 but differ in the proboscis hooks size which in *P. umbellatus* are larger (1<sup>st</sup> row of hooks 0.089-0.119 mm, 2<sup>nd</sup> row of hooks 0.083-0.100 mm, 3<sup>rd</sup> row of hooks 0.053-0.065, 4<sup>th</sup> row 0.035-0.041 mm), size of eggs and in having a different host. On account of its striking anatomical peculiarities and structural difference from the already known members of this genus, it has been described as a new species and has been named as *Pallisentis munifi* n. sp. in honour of Prof. Dr. M. Munif Khan, Parasitologist, Department of Zoology, University of Sindh, Jamshoro.

## REFERENCES

- Amin, O.M. (2013). Classification of Acanthocephala. *Folia Parasitologica*, 60: 273–305.
- Amin, O.M., R.A Heckmann, N.V. Ha, P.V. Luc and P.N. Doann (2000). Revision of the genus *Pallisentis* (Acanthocephala: Quadrigyridae) with the erection of three new subgenus, the description of *Pallisentis* (*Brevitritospinus*) *vietnamensis* subgen. et. sp. n., a key to species of *Pallisentis* and description of a new quadrigyrid genus, *Pararaosentis* gen. n. *Comp. Parasitol.*, 67: 40-50.
- de Graff, G. and a. Latif (2002). Development of freshwater fish farming and poverty alleviation. A case study from Bangladesh. *Aquaculture Asia*, 7 (2): 5-7.
- Golvan, Y.J. (1959). Le Phylum des Acanthocephala. Deuxième note la classc de Eoacanthocephala (Van Cleave, 1936). *Ann. Parasitol. Hum. Comp.*, 34: 5–52.
- Khan, A. and F.M. Bilqees (1985). *Pallisentis kalriai*, new species (Acanthocephala: Quadrigyridae) from the fish *Labeo rohita* of Kalri Lake, Sindh, Pakistan. *The Philippine Journal of Science*, 114 (1–2): 101–111.
- Khan, A. and F.M. Bilqees (1987). Two new Acanthocephala species from freshwater fishes of Kalri Lake. *Pakistan J. Zool.*, 19: 263–271.
- Ramudu, K.R., g. Dash and T.J. Abraham (2013). Parasitic study of *Cirrhinus mrigala* (Hamilton, 1822) in selected districts of West Bengal, India. *International Journal of Advanced Biotechnology and Research*, 4: 419-436.
- Saeed, R. and F.M. Bilqees (1971). *Pallisentis magnum*, new species (Acanthocephala: Quadrigyridae) from the fish *Wallago attu* of Kalri Lake, West Pakistan. *Pakistan J. Zool.*, 3: 221–223.
- Van Cleave, H.J. (1926). Preliminary report on the Acanthocephala from fishes of China (Abstr.) 2. *Ann. Meet. Progr. Am.Soc. Par.* p. 6.
- Van Cleave, H.J. (1928). Acanthocephala from China. I. new species and a new genus from China fishes. *Parasitology*, 20: 1–9.
- Yamaguti, S. (1963). The Acanthocephala of vertebrates. In: *Systema helminthum*. Vol. 5 New York Interscience, 423 pp.

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