



RRST-Zoology

## Biosystematic Studies on *Amoebotaenia minuta* sp. Nov. (Cestoda: Dilepididae) from *Vanellus malbaricus*

S.S. Nanware<sup>1</sup>, R.M. Dhondge<sup>2</sup> and D.B. Bhure<sup>1</sup><sup>1</sup>Assistant Professor, Research and Post Graduate Department of Zoology, Yeshwant Mahavidyalaya, Nanded 431 602 (M. S.)<sup>2</sup>Department of Zoology, Shri. Sant Gadge Maharaj Mahavidyalaya, Loha 431 708Dist.- Nanded (M. S.)

Article Info	Abstract
<p><b>*Corresponding Author</b></p> <p>Tel : 09423401227</p> <p>Email: <a href="mailto:snanware@rediffmail.com">snanware@rediffmail.com</a></p> <p>©ScholarJournals, SSR</p>	<p>The study focused on the observation of haematological parameters in <i>Gallus gallus domesticus</i> which is naturally infected with cestode parasites <i>Cotugnia diagnopora</i>. Out of 43 <i>Gallus gallus domesticus</i>, 28 are infected with cestode parasite. The significant increase in size of RBC and number of WBC; however reduction in the count of RBC, Hb, PCV, MCV in infected <i>Gallus gallus domesticus</i> as compared with normal one. The haematological parameters of the infected bird <i>Gallus gallus domesticus</i> shows high infection cause macrocytic anaemia, lymphocytosis due to deficiency of related factors.</p> <p><b>Key Words:</b> <i>Cotugnia diagnopora</i>, <i>Gallus gallus domesticus</i>, Haematological parameters</p>

### Introduction

The genus *Amoebotaenia* was erected by Cohn [1], with its type species *A. brevis* collected from *Charadrius pluvialis*. Subsequently following species are added to this genus

*Amoebotaenia* Viz.

- 1 *A. sphenoides*, [2]
- 2 *A. brevicollis*, [3]
- 3 *A. vanelli*, [3]
- 4 *A. pekiensis*, [4].
- 5 *A. fuhrmanni*, [4]
- 6 *A. indiana*, [5]
- 7 *A. megascolecis*, [5].
- 8 *A. maharashtrii*, [5]
- 9 *A. cohni*, [6]
- 10 *A. kharatia* [6]
- 11 *A. mohekarae*, [7].
- 12 *A. soyagaonensis* [8].
- 13 *A. bhujangi* [9]

The present communication deals with the description of a new species *A. minuta* Sp. Nov. collected from the intestine of *Venellus malbaricus* at Deglur, District Nanded, (M.S.) India during the period of July, 2006 to June, 2009.

### Materials and Methods

During the survey of cestode parasites of birds, on the through examination of 06 specimens of *Venellus malbaricus* from different localities of Deglur, District – Nanded (M.S.) India; only four were found infected with the fourteen specimens of cestode belonging to the genus *Amoebotaenia*; during the period of July, 2006 to June, 2009. The recovered cestodes were flattened with the help of two plane glass slides tied with rubber bands and, preserved in 4% formalin, stained with Harri's Haematoxylin, dehydrated in ascending grades of alcohols, cleared in xylene, mounted in D.P.X. and drawing

were made with the aid of Camera Lucida. All measurements are recorded in millimeters using ocular micrometer.

### Results

#### (Description based on fourteen specimens; Figure 1&2)

The worms are considerably small, with scolex, few immature, mature proglottids, and measures 10-15 mm in length. The scolex is small in size, oval in shape, distinctly marked off from body, broad anteriorly and narrow posteriorly and measures 1.335 (1.219-1.452) x 0.911 (0.795-1.028) in length and breadth. The rostellum is small in size, oval in shape, having rostellar sac, with two rows of hooks and measures 0.143 (0.127-0.159) x 0.190 (0.127-0.254) in length and breadth. Rostellar hooks are medium in size, arranged in two rows, 16-18 in numbers, narrow anteriorly and broad posteriorly and measures 0.053 (0.031-0.074) x 0.007 (0.005-0.010) in length and breadth. The rostellar sac is large in size, elongated, funnel shaped, extending up to the posterior end of the scolex and measures 0.53 (0.47-0.58) x 0.19 (0.13-0.24) in length and breadth. The scolex bears four suckers, which are large in size, oval in shape, double walled, arranged in two groups, overlapping on each other in each pair and measures 0.344 (0.328-0.360) x 0.333 (0.318-0.349) in length and breadth. The scolex is followed by neck, which is short, broader than long and measures 0.159 (0.148-0.169) x 0.620 (0.583-0.657) in length and breadth.

The mature proglottids broader than long, almost two times broader than long, with convex margins, with short blunt projections at the posterior corners of the segment and measures 0.901 (0.742-1.06) x 1.92 (1.80-2.05) in length and breadth. The testes are oval to rounded in shape, small in size, 30-40 in numbers, scattered all over the segment and measures 0.084 in diameter. The cirrus pouch is medium in size, oval in shape, elongated, runs transversely, placed at anterior side of the segment and measures 0.286 (0.275-

0.296) x 0.084 (0.074-0.095) in length and breadth. The cirrus is thin, protrusible, coiled, contained within the cirrus pouch and measures 0.339 (0.275-0.402) x 0.00795 (0.005-0.010) in length and breadth. The vas deferens is a long tube, bend and coiled, directed towards anterior side and measures 0.169 (0.159-0.180) x 0.007 (0.005-0.010) in length and breadth. The vagina and cirrus pouch opens from a common genital pore, which is oval to rounded in shape, placed marginally, irregularly alternate and measures 0.037 (0.031-0.042) x 0.058 (0.053-0.063) in length and breadth.

Vagina is a thin tube, start from the genital pore, posterior to cirrus pouch, runs transversely for a short distance, takes a posterior curve, enlarge to form a receptaculum seminis and measures 0.795 (0.742-0.848) x 0.013 (0.010-0.015) in length and breadth. The receptaculum seminis is small tube, joins to ootype and measures 0.090 (0.084-0.095) x 0.015 (0.010-0.020) in length and breadth. Ootype is small, oval in shape, compact and measures 0.042 in diameter. The ovary is distinctly bilobed, 'V' or 'U' shaped, situated almost in the poral half of the segment, forms from many acini and measures 0.11 (0.08-0.14) x 0.17 (0.15-0.19) in length and breadth. The vitelline gland is a small in size, oval in shape, post-ovarian in position, compact and measures 0.045 in diameter. The longitudinal excretory canals is long, runs either side of the segment and measures 1.04 (1.03-1.05) x 0.013 (0.010-0.015) in length and breadth.

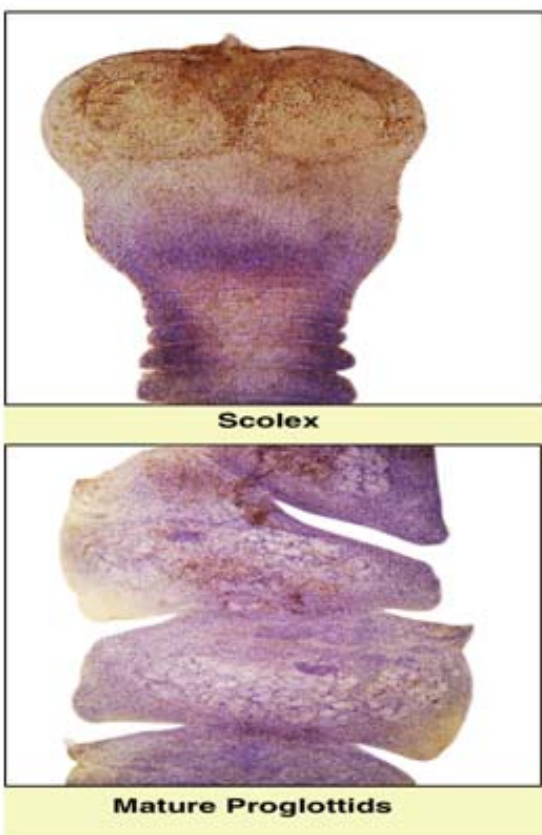


Figure 1. Microphotoplate of *Amoebotaenia. minuta* Sp. Nov.

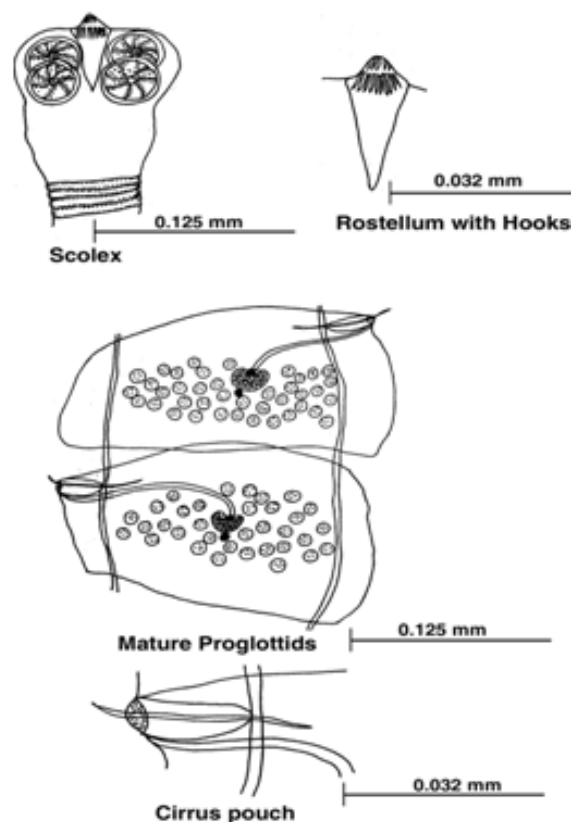


Figure 2. Camera Lucida diagram of *Amoebotaenia. minuta* Sp. Nov.

## Discussion

After going through literature the worms under discussion is having scolex oval, broad anterior side and narrow towards posterior side, Rostellum is small, oval to rounded in shape, having rostellar sac. Rostellar hooks are small, arranged in a two circle or rows, 16-18 in numbers, Rostellar sac is large, elongated, funnel shaped. Suckers are four in numbers, arranged in two groups, over lapping to each other. Neck is short. Mature proglottids are two times broader than long, with convex lateral margin. Testes are oval to rounded in shape, 30-40 in numbers, scattered all over the segment. Cirrus pouch is medium, elongated, placed at anterior side of segment. Cirrus is protrusible, within cirrus pouch. Vas deferens is coiled. Vagina is posterior to cirrus pouch. Genital pore is marginal, irregularly alternate. Ootype is small, oval, compact. Ovary is bilobed, 'V' shaped. Vitelline gland is oval, compact, post-ovarian, and longitudinal excretory canal runs through either side of the segment.

The present from comes closer to all the known species of the genus *Amoebotaenia* in general topography of organs, but differs due to some characters from following species.

- 1) The present from differs from *A. sphenoides*, in having number of segment (15-18 Vs 18-23), Number of hooks (16-18 Vs 14) and number of testes (30-40 Vs 12-14).
- 2) The present tapeworm differs from *A. brevicollis*, in the number of segment (15-18 Vs 24), number of testes (30-40 Vs 12-15), number of hooks (16-18 Vs 16).

- 3) The present form differs from *A. vanelli*, in having number of segment (15-18 Vs 25) and number of testes (30-40 Vs 18-20).
- 4) The present parasites differ from *A. pekinensis*, due to number of segment (15-18 Vs 16-20), number of rostellar hooks (16-18 Vs 16), and number of testes (30-40 Vs 12-20).
- 5) The present worm differs from *A. fuhrmanni* due to number of proglottids (15-18 Vs 17-31), number of rostellar hooks (16-18 Vs 10) and number of testes (30-40 Vs 12-16).
- 6) The present communication differs from *A. indiana*, in having number of segments (15-18 Vs 14-15), number of rostellar hooks (16-18 Vs 10) and number of testes (30-40 Vs 10-12)
- 7) The present cestode differs from *A. megascolesis*, due to number of segment (15-18 Vs 14-16), number of testes (30-40 Vs 14-17) and number of rostellar hooks (16-18 Vs 14).
- 8) The present worm under differs from *A. maharashtrii*, in having number of rostellar hooks (16-18 Vs 14) and number of testes (30-40 Vs 11)
- 9) The present form under discussion differs from *A. cohnii*, due to number of proglottids (15-18 Vs 13), number of rostellar hooks (16-18 Vs 12) number of testes (30-40 Vs 8-9).
- 10) The present form differs from *A. kharatia*, in having number of proglottids (15-18 Vs 16), Numbers of hooks (16-18 Vs 18) and number of testes (30-40 Vs 13-15).
- 11) The present form further differs from *A. mohakarai*, in having shape and size of scolex (oval, 1.335 x 0.911 Vs globular, 0.128-0.413 x 0.146 – 0.461) size of rostellum (small, 0.143 x 0.190 Vs medium, 0.049 – 0.097 x 0.218) Rostellar hooks (medium, arranged in two rows, 16-18 in number Vs arranged in single circle, 24 in number), Neck (short Vs absent), mature segments (two times broader than long, 0.901 x 1.92 Vs three times broader than long, 0.124-0.510 x 1.226 – 1.329), number of testes (30-40) Vs 34-35), Genital pore (irregularly alternate, 0.037 x 0.058 Vs regularly alternate (0.022 – 0.034), size of vitelline gland (small, 0.045mm in diameter Vs large 0.170 x 0.090 mm in length and breadth) and reported from (*Venellus malbaricus* Vs *Gallus domesticus*)
- 12) The present from under discussion differs from *A. soyagaonesis*, in the presence of number of rostellar hooks (16-18 Vs 46), Number of testes (30-40 Vs 53-56), Number of segments (32 Vs 44) and reported from *V. malbaricus* Vs *Gallus domesticus*
- 13) The observed specimen *A. minuta* further differs from *A. bhujangi*, in shape and size of organ i.e. scolex oval, 1.335 x 0.911 Vs squarish, 0.260 x 0.242-0.320mm; Arrangement of rostellar hooks. (double circle Vs single circle) shape and size of Mature proglottid (two times broader than long, 0.901 x 1.92 Vs squarish, 0.181 x 0.234mm) Number of testes (30-40 Vs 28) Shape of ovary ('V' or 'U' shaped Vs bilobed) position of Genital pore (irregularly alternate Vs regularly alternate).

#### Conclusion

In the light of these observations, present cestode is considered as a new species, it is named as *Amoebotaenia minuta* Sp. Nov. due to small size of the worm.

#### Taxonomic Summary

**Type species** : *Amoebotaenia minuta* Sp. Nov.

**Host** : *Venellus malbaricus*.

**Habitat** : Intestine

**Locality** : Deglur District- Nanded (M.S.), India.

**Prevalence** : 14 specimens are collected from four dissected host out of 06 examined.

**Period of collection** : July, 2006 to June, 2009.

**No. of Specimen** : 14

**Accession number** : PGDZ/YMN/1-5/July, 2006- June, 2009.

**Deposition** : Research Laboratory, Department of Zoology, Yeshwant Mahavidyalaya, Nanded. (M.S.) India.

**Etymology** : The present species is named as *A. minuta* Sp. Nov. due to the small size of parasites.

#### A Key to the Species of the Genus *amoebotaenia* [1]

Number of proglottids below

15 in number - *A. cohnii* [6]

Number of proglottids above 15 in numbers - 1

1. Testes 10-12 in number - 2

Testes 12-15 in number - 3

Testes 12-20 in number - *A. pekinensis*, [4]

Testes 14-17 in number - *A. megascolesis* [5]

Testes 10-12 in number - *A. vanelli* [3]

Testes in between 20-40 in numbers - 4

Testes above 40 in numbers-*A. soyageonensis* [8]

2. Rostellar hooks 10 in numbers - *A. indiana* [5]

Rostellar hooks 14 in numbers- *A. maharashtrii* [5]

3. Rostellar hooks 10 in numbers - *A. fuhrmanni* [4]

Rostellar hooks 14 in numbers - *A. sphenoides* [2]

Rostellar hooks 16 in numbers - *A. brevicollis* [3]

Rostellar hooks 18 in numbers - *A. kharati* [6]

Rostellar hooks 16-18 in numbers- *A. minuta* Sp. Nov.

4. Rostellar hooks 24 in numbers - *A. mohakarai* [7]

Rostellar hooks 16 in numbers - *A. bhujangi* [9]

#### Acknowledgements

The authors are indebted to Dr. N.V. Kalyankar, Principal, Yeshwant Mahavidyalaya, Nanded and Dr. Ashok Gavate, Principal, Shri Sant Gadge Maharaj Mahavidyalaya, Loha, Dist. Nanded, for their kind help, inspiration and providing necessary laboratory facilities.

#### References

- [1] Cohn, L. 1900. Zur Anatomie der Vogelcestoden. I.Z. Wiss. Zool. 6, 155-290.
- [2] Fuhrman, 1907. Die Systematic der ordnung der Cyclophyllidea. Zool. Anz. 32, 289-297.
- [3] Railliet, A. 1892. Sur un tenia du pigeon domestique representant une espece nouvelle (*Taenia delafondelis*). Compt. Rend. Soc. Biol. 4. 49-53.
- [4] Tseng Shen, 1932. Studies on avian cestodes from China, Part-I, Cestodes from Chardriiform birds, Parasit., 24:87-106.
- [5] Shinde, G.B., (1972) : New avian cestodes of the genus *Amoebotaenia* Cohn, 1900 in India. Marath. Uni. J.Sci., 4: 5-15. Vol.XI.
- [6] Kalayankar, S.D. and Palladwar, V.D., (1977) : On a new species of avian cestode of genus *Amoebotaenia* (Dilepididae, Dilepidinae) Cohn, 1900 from India. Annales de la facultad de veterinaria de Lenon (1975), Publ, (1977) 21: 27-37 (En, Fr, es.).

- [7] Jadhav, B.V. , Khadap, R.M. and Pawar R.G. (2004): A new species of the genus *Amoebotaenia* (Cohn, 1900) from *Gallus domesticus* at Aurangabad (M.S.) National J. Life Sci. 1 (2), 2004, (309-311).
- [8] Khadap, R.M., Jadhav, B.V. and Pawar, R.G. (2005): A new species of genus *Ameobotaenia* (Cohn, 1900) from *gallus domesticus* at Aurangabad Indian J. Helminth. (N.S.) 23:31-34.
- [9] Garad, V.B. and Nanware, S.S., (2010) :Taxonomic studies on cestode genus *Amoebotaenia* Cohn, 1900, (Cestoda: Dilepididae) from *Venellus malbaricus* with description of a new species. Asian J. Animal Sci.5,1:(14-16).