



Original Research Article

A New Species of *Amoebotaenia prabhuravii* Sp. Nov. From *Gallus gallus domesticus* (Linnaeus, 1758) from Aurangabad (M.S), India.

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ABSTRACT

The present communication deals with the description of a new species of genus *Amoebotaenia prabhuravii* Sp. Nov. From *Gallus gallus domesticus* (Linnaeus, 1758) from Aurangabad provided new data on their morphology. The present form differ from the known species of the genus in the shape and size of the scolex, shape and number of hooks number of testes, number of Mature Proglottids and shape of Viteline gland.

Keyword: *Amoebotaenia prabhuravii* Sp. Nov.; *Gallus gallus domesticus* (Linnaeus, 1758); Aurangabad (M.S), India

INTRODUCTION

The genus *Amoebotaenia* was erected by Cohn in 1900, with as type species *A. sphenoides* Cohn in 1899 [1] collected from the *Vanellus dongolanus* Fuhrmann, 1907 added *A. brevicolis* and *A. vanelli* [2] from *Charadrius nubicus* and *Vanellus dongolanus* in Egypt. Later on Meggit, 1927 added *A. fragida* [3] from *G. domesticus* Tseng in 1932 added *A. Fuhrmanni* and *A. pekinensis* [4] from *Gallinago* and *Charadrius veredus* in Nanking and Peking. Yamaguti, in 1935 added *A. oligorchis* [5] in Japan from *G. domesticus*. Later on first time at Aurangabad (M.S.) India in 1972 Shinde,

added three new species of *A. indiana*, *A. maharashtri* and *A. magoscolesis* from *Francolinus pondicerianus* and *G. domesticus* [6]. Later on Kalyankar and Palladwae, 1975 added *A. cohni* and *A. Kharati* [7] also in India from *G. domesticus*. In 1980 Gaikwad, described *A. bhonslei* [8] from *G. domesticus* and Ghare, Shinde and Suryawanshi in 1979 added *A. domesticus* [9] from *G. domesticus* in India. Jadhav 2004 added *A. mohekarae* [10] from *G. domesticus*. In 2005 Khadap added *A. soyagoanesis* [11] from *G. domesticus*. Then Thorat in 2009 added *A. jadhavae* [12] from *G. domesticus*

at Aurangabad. In 2010 Garad, added *A. bhujangi* [13] from *Venellus malbaricus* and finally Nanware in 2011 added *A. minuta* [14] from *Venellus malbaricus* in India. So far 19 species of *Amoebotaenia* are reported. Later on no more species in added to these genus. The present communication deals with Taxonomy of a parasite *Amoebotaenia prabhuravii* sp. nov.

MATERIALS AND METHODS

The intestine of the host *Gallus gallus domesticus* were collected from different places of Aurangabad District during the period of June 2009 to May 2011. The worms were collected from the alimentary tract of *Gallus gallus domesticus*. Then flattened and preserved in 4% formalin. These cestodes stained by Harris haematoxyline or Borax carmine washed in distilled water, dehydrated in ascending grades of alcohol, cleared in xylene, mounted in D.P.X and drawing are made with the aid of camera lucida. Identification was carried out with the help of Systema Helminthium Vol. I Yamaguti (1957) [15].

RESULT

The cestode parasites were collected from the gastrointestinal tract of *Gallus g. domesticus* (Linnaeus, 1758) in the duration June 2009 to May 2011 (two ninety four) at Khultabad district Aurangabad, M.S. India

The cestodes were very small, having few proglottids. The parasites were flattened, preserved in 4% formalin, stained with Harris-haematoxylin, passed through various alcoholic grades, cleared in xylene and mounted in DPX and whole mount slides were prepared, for further taxonomical studies. Drawings were made with the aid of camera lucida and all measurements are given in millimetres. As the characters of the cestodes are sufficient to accommodate the parasites as a genus *Amoebotaenia* and supported by the order diagnosis, family diagnosis and generic diagnosis given by the Yamaguti (1959) [16] hence the

species are identified as it the genus *Amoebotaenia* Cohn (1900)[17].

All the cestodes were considerably small, creamy white in colour having scolex, strobilla, consisting of above 30 (33) proglottids having followed by short neck, immature, mature and gravid segments. The worm measures 0.25 mm in length and (0.1 to 0.2 mm) in its maximum width.

The scolex is small in size, oval in shape, distinctly marked off from body, narrow anteriorly, anterior end of the scolex protruded as rostellum, with four prominent suckers, sharply constricted at posterior margin and followed by neck and immature segments and measures 0.0488(0.0444-0.0532) in length and 0.0377(0.0266-0.0444) in breadth.

The rostellum is well developed, as cone like anterior projection, which is small in size, retractile, situated at the apex of scolex. It is armed with crown of single circle of hooks and measures 0.0066(0.0022-0.01332) in length and 0.00888(0.044-0.0222) in breadth.

The rostellar hooks are 16 in numbers, with crown of single circle hooks which are long, rosethorn shaped and measures 0.0222 (0.0177-0.0266) in length and 0.006 (0.005-0.007) in breadth.

The suckers are four in numbers, large in size, round or oval in shape, arranged in two pairs, overlapping and measures 0.345(0.329-0.361) in length and 0.332(0.319-0.347) in breadth.

The neck is short, broad and followed by immature, mature and gravid segments which measures 0.0177(0.088-0.0266) in length and 0.01554 (0.004- 0.022) in breadth.

The mature proglottids are two times longer than broad, craspedote, with slightly concave or convex lateral margins having short blunt, conical projections at the posterior corners of the segments slightly unequal in length, single set of reproductive organ and measures 0.0621 (0.0577-0.0710) in length and 0.08436(0.0666-0.09768) in breadth.

The testes are 35-40 (39) in numbers, medium in size, rounded in shape, behind posterior sides of ovary, scattered all over the segment, within the longitudinal excretory canals and measures 0.0110(0.0022-0.0177) in diameter.

The cirrus pouch is well developed, medium in size, oval in shape, elongated, placed at anterior corner of the segments, narrow proximally and broad distally and measures 0.00755(0.00222-0.001332) in length and 0.00222(0.00210-0.00240) in breadth.

The cirrus is thin tube, coiled, within the cirrus pouch and measures 0.0199(0.0177-0.0210) in length and 0.00888 (0.00860-0.00895) in breadth.

The vas deferens is long tube, slightly coiled anteriorly directed and measures 0.168(0.159-0.177) in length and 0.006(0.004-0.009) in breadth. The vagina and cirrus pouch opens as a common genital pores which is comparatively small in size, oval in shape, situated marginally, alternate regularly and measures 0.030(0.027-0.040) in length and 0.047 (0.042-0.053) in breadth.

The ovary is large in size, bilobed, somewhat elongated, occupying all portion of the segment, alternating extremely, situated anterior part of the segment, aporal lobe is longer than poral lobe with 2 to 3 blunt accinies and measures 0.0088(0.0070-0.0092) in length and 0.0044 (0.0025-0.0050) in breadth. The vagina is narrow tube and runs parallel to the cirrus pouch, and enlarge forms receptaculum seminis and measures 0.0288 (0.0250-0.0299) in length and 0.00133(0.00117-0.00142) in breadth. The receptaculum seminis is long, opens into the Ootype and measures 0.093(0.082-0.095) in length and 0.014(0.010-0.021) in breadth. The ootype is small in size, oval to round in shape, not attached to ovary, postero-ventral to the ovary and measures 0.0088 in diameter.

The vitaline gland is medium in size, 'V' in shape, not attached to ovary post-ovarian and measures 0.0066 (0.0055-0.0072) in length and 0.0011(0.005-0.0017) in breadth. The

longitudinal excretory canals are long tube, paired, running across proglottids, longitudinally on both the side of proglottids and measures 0.088 (0.077-0.095) in length to 0.0044(0.0022-0.0050) in breadth.

The gravid segment is longer than broad, two times longer than broad; concave or convex lateral margins having short blunt at the posterior corner of the segment, 0.0521 (0.0517-0.0530) in length and 0.0699(0.6104-0.06436) in breadth. Inner longitudinal muscles split up into individual fibers in posterior segments and contain large number of loosely packed eggs and measures 0.02 X 0.03 in diameter.

DISCUSSION

The genus *Amoebotaenia* was erected by Cohn, in 1900 [17] with the type species *A. sphenoides* from *Vanellus dongolanus*. Since then 19 species are added to this genus.

After going through the literature the present worm differs from *A. oligorchis* Yamaguti, 1935 [5], *A. fuhrmanni* Tseng, 1932 [4], *A. fragida*, Meggit, 1927 [3], *A. megascolesis*, Shinde, 1972, *A. maharashtrii*, Shinde, 1972 [6]. *A. cohni* Kalyankar and Palladwae, 1975 [7], *A. kharatia*, Kalyankar and palladwae, 1975 [7], *A. bhonslei*, Gaikwad, 1980 [8], *A. mohekarae*, Jadhav 2004 [10]. *A. soyagaonensis*, Khadap 2005 [11], *A. jadhavae* Thorat 2009 [12], *A. minuta*, Nanware 2011 [14] and *A. bhujangi* Garad 2010 [13].

But it resembles with *A. brevicollis*, Fuhrmann 1907 [2], *A. sphenoides*, Chon, 1899 [1], *A. vanelli*, Fuhrmann, 1907 [2], *A. pekinensis*, Tseng, 1932 [4], *A. indiana*, Shinde, 1972 [6], *A. domesticus* Ghare, Shinde and Suryawanshi 1979 [9] in the number of hooks and number of Proglottids and differs from the same in few characters which are summarized below.

1) The present worm differs from *A. sphenoides* (Chon, 1899) [1] in having number of segment (33 Vs. 16-23), number of hooks (16, rosethorn shape Vs. 14) and number of testes (35-40, rounded Vs. 12-14), opening of genital organ (9th segment

- regular alternate Vs. testes seen in 1st and 2nd segment), ovary (bilobed ,somewhat elongated Vs. bilobed) and host (*Gallus domesticus* as against *Vanellus dongolanus*)
- 2) The present tapeworm differs from *A. brevicollis*, (Fuhrmann, 1907) [2] in having the number of segments (33 Vs.24), number of testes (35-40 rounded Vs.12-15), opening of genital organ (9th segment regular alternate Vs. immediately behind the scolex), ovary (bilobed, somewhat elongated Vs. bilobed), host (*Gallus domesticus* as against *Charadrius nubicus*), and locality (India Vs. Egypt).
 - 3) The present worm differs from *A. vanelli*, (Fuhrmann, 1907)[2] in having number of segments (33 vs.25) and number of testes (35-40, rounded Vs.18-20), host (*Gallus domesticus* as against *Vanellus dongolanus* and locality (India Vs. Egypt).
 - 4) The present worm differs from *A. fragida* (Meggit, 1927) [3] in having number of hooks (16 in number, single circle, rosethorn shape Vs. 30, 0.051 long in two rows), mature proglottids (33 Vs.12), and number of testes (35-40 Vs. 11-15 in two rows).
 - 5) The present parasites differ from *A. pekinensis*, (Tseng, 1932) [4] in having number of segments (33 Vs. 16-20), and number of testes (35-40, rounded Vs.12-20), length of scolex (0.0488, oval Vs. 0.27mm), ovary (bilobed, somewhat elongated Vs. bilobed), host (*Gallus domesticus* as against *Charadrius veredus*), and locality (India Vs. Peking).
 - 6) The present worm differs from *A. fuhrmanni* (Tseng, 1932) [4] in having number of proglottids (33 Vs.17-31), number of rostellar hooks (16, rosethorn shape Vs. 10, long) and number of testes (35-40, rounded Vs. 12-16, behind female genital organ), opening of genital organ (9th segment regular alternate Vs. immediately behind the scolex), host (*Gallus domesticus* as against *Gallinago sp.*), and locality (India Vs. Nanking).
 - 7) The present worm differs from *A. oligorchis* (Yamaguti, 1935) [5] in having number of mature proglottids (33 Vs. 28), cirrus pouch (elongated Vs rostellar hooks (16, rosethorn shape Vs. 0.033, long), and number of testes (35-40, scattered posterior sides of ovary Vs. 6 spread transversally in posterior lateral margin of segment), Locality (India Vs. Japan).
 - 8) The present worm differs from *A. indiana*, (Shinde, 1972) [6] in having number of segments (33 Vs.14-15), number of rostellar hooks (16, rosethorn shape Vs. 10, long) and number of testes (35-40, rounded, scattered posterior sides of ovary Vs. 10-12, serially arranged along the posterior margin of segments), scolex shape (distinctly marked from body Vs. small, oval), neck (present Vs. absent), opening of genital organ (9th segment, genital pore regularly alternate Vs. 4th segment regular alternate), cirrus pouch (elongated Vs broad), ovary (bilobed, somewhat elongated Vs. bilobed), vitaline gland ('V' shape Vs. triangular and compact).
 - 9) The present worm differs from *A. megascolexis*, (Shinde, 1972)[6] in having number of segments (33 Vs. 14-16), number of testes (35-40 Vs. 14-17) and number of rostellar hooks (16, rosethorn shape Vs. 14, long), scolex shape (oval, distinctly marked from body Vs. quadrangular), neck (present Vs. absent), ovary (bilobed, somewhat elongated Vs. bilobed, poral lobe shorter than aporal lobe), opening of genital organ (9th segment regular alternate Vs. genital pore regularly alternate) vitaline gland ('V' shape Vs. compact), host (*Gallus domesticus* as against *Francolinus pondicerianus*).
 - 10) The present worm differs from *A. maharashtrii*, (shinde, 1972) [6] in having number of segments (33 Vs. 15) number of rostellar hooks (16, rosethorn shape Vs. 14,

- long) and number of testes (35-40 Vs. 11), scolex shape (oval, distinctly marked from body Vs. quadrangular), neck (present Vs. absent), opening of genital organ (9th segment, genital pore regularly alternate Vs. 4th segment regular alternate), vitelline gland ('v' shape Vs. bean shaped), ovary (bilobed, somewhat elongated Vs. bilobed).
- 11) The present worm differs from **A. cohni**, (Kalyankar and Palladwae), 1975 in having number of proglottids (33 Vs. 15-18), number of rostellar hooks (16, rosethorn shape Vs. 12, long) number of testes (35-40, rounded Vs. 8-9), opening of genital organ (9th segment, genital pore regularly alternate Vs. 4th segment regular alternate).
 - 12) The present worm differs from **A. kharati**, (Kharati, Kalyankar & Palladwae,) 1975 [7] in having number of proglottids (33 vs. 16), numbers of hooks (16, rosethorn shape vs. 18, long) and number of testes (35-40, rounded Vs. 13-15), opening of genital organ (9th segment regular alternate Vs. male genital system starts in 4th segment).
 - 13) The present worm differs from **A. bhonslei** (Gaikwad, 1980) [8] in having opening of genital organ (9th segment regular alternate Vs. 8th segments), number of mature proglottids (33 Vs. 12), and number of testes (35-40, rounded, scattered posterior sides of ovary Vs. 27-28 serially arranged along posterior margin).
 - 14) The present worm differs from **A. domesticus** (Ghare, Shinde and Suryawanshi) 1979 [9] in having shape and size of scolex (oval, distinctly marked from body Vs. small, quadrangular), neck (present Vs. absent), cirrus well developed (thin tube Vs. spiny), mature proglottids (33 Vs. 10-12), number of testes (35-40, rounded, scattered posterior sides of ovary Vs. 10 arranged serially along the posterior margin of segments), vitelline gland ('V' shape Vs. compact) ovary (bilobed, somewhat elongated Vs. bilobed).
 - 15) The present worm further differs from **A. mohekarae**, (Jadhav 2004) [10] in having shape and size of scolex (oval, distinctly marked from body Vs. globular), size of rostellum (small, cone like projection Vs. medium) rostellar hooks (16, rosethorn shape Vs. arranged in single circle, 24 in number), neck (present Vs. absent), mature segments (33 in number and two times longer than broad Vs. three times broader than long), number of testes (35-40, rounded, scattered posterior sides of ovary Vs. 34-35), size of vitelline gland ('V' shape Vs. large), ovary (bilobed, somewhat elongated Vs. 'U' shape).
 - 16) The present worm differs from **A. soyagaonesis**, (Khadap 2005) [11] in having the presence of number of rostellar hooks (16, rosethorn shape Vs. 46), number of testes (35-40 Vs. 53-56), and number of segments (33 Vs. 44), locality (Khultabad Vs. Soyagaon).
 - 17) The present worm further differs from **A. jadhavae** (Thorat 2009) [12] in size and shape of scolex (oval, distinctly marked from body Vs. large & rectangular), shape of rostellum (small, cone like projection vs. large, oval), number of hooks (16 in number and rosethorn shape Vs. 46 in number and arranged in single circle in rostellum), opening of genital organ (9th segment regular alternate Vs. anterior side of segment unilateral) neck (present Vs. absent), cirrus pouch (elongated Vs. oval), and vitelline gland ('V' shape Vs. oval), ovary (bilobed, somewhat elongated Vs. bilobed, marginally irregular).
 - 18) The present worm differs from **A. bhujangi**, (Garad 2010) [13] in having shape and size of scolex i.e. (oval Vs. squarish, 0.260 x 0.242-0.320mm), arrangement of rostellar hooks. (16 rosethorn shape Vs. single circle) shape and size of mature proglottids (33 in numbers, with concave lateral margin Vs. squarish, 0.181 x 0.234mm), number of

testes (35-40 Vs. 28), ovary (bilobed, somewhat elongated Vs. bilobed), and host (*Gallus domesticus* as against *Venellus malbaricus*)

19) The present worm further differs from *A. minuta* (Nanware 2011) [14] in having arrangement of rostellar hooks. (Single circle 16 Vs. double circle), number of testes (35-40 Vs. 30-40), shape of ovary (bilobed Vs. 'V' or 'U' shaped), vitaline gland ('V'

shaped Vs. oval) position of genital pore (regularly alternate Vs. irregularly alternate), host (*Gallus domesticus* as against *Venellus malbaricus*), locality (Khultabad Vs. Nanded (M.S.)India.

20) These distinct characters are more than enough to erect a new species from this genus and hence the name *Amoebotaenia prabhuravii* n.sp name is given in honour of my father Mr. Prabhurao Laxmanravji Aade.

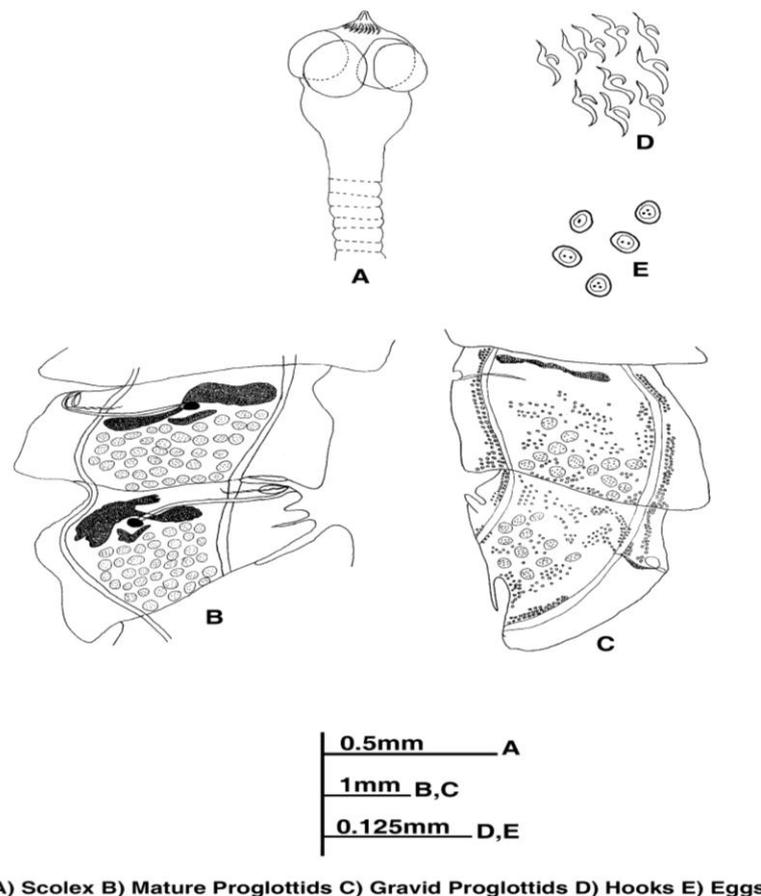


Fig. 1: *Amoebotaenia prabhuravii* n.sp

A Key to the Species of the Genus *Amoebotaenia*

- Number of proglottids below 15 in number- *A. cohni* Kalyankar and Palladwae, 1975
- Number of proglottids above 15 in numbers - [1]
- Number of Proglottids above 30 in numbers - [2]
- Number of Proglottids below 30 in numbers - [3]

1. Testes 10-12 in number -	[4]
Testes 12-15 in number -	[5]
Testes 12-20 in number -	<i>A. pekinensis</i> Tseng, 1932

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- Testes 14-17 in number - ***A.megascolesis*** Shinde, 1972
- Testes 10-12 in number - ***A.vanelli*** Fuhrmann, 1907
- Testes 20-30 in numbers - ***A.bhujangi*** Garad 2010
- Testes in between 25-30 in numbers- ***A. bhonslei*** Gaikwad, 1980.
- Testes above 40 in numbers- ***soyageonensis*** Khadap 2005
- Testes in between 53-56 - ***A. jadhavae*** 2009
2. Number of Proglottids above 30- (6)
3. Number of Proglottids below 30- [7]
4. Rostellar hooks 10 in numbers - ***A.indiana*** Shinde, 1972
 Rostellar hooks 14 in numbers - ***A.maharashtrii*** Shinde, 1972
 Rostellar hooks single crown of hook 16 in numbers- ***A.domesticus*** Ghare, Shinde and Suryawanshi 1979
5. Rostellar hooks 10 in numbers - ***A.fuhrmanni*** Tseng, 1932
 Rostellar hooks 14 in numbers - ***A.sphenooides*** Chon, 1899
 Rostellar hooks 16 in numbers - ***A.brevicollis*** Fuhrmann, 1907
 Rostellar hooks 18 in numbers - ***A.kharati*** Kalyankar and Palladwae, 1975
 Rostellar hooks 16-18 in numbers- ***A.minuta*** Nanware 2011
 Rostellar hooks 24 in numbers - ***A.mohekarae*** Jadhav 2004
 Rostellar hooks 30 in numbers - ***fragida*** Meggit, 1927
6. Shape of ovary elongated, occupying all portion of the segment - ***A. prabhuravii sp.nov.***
7. Testes in between 5-10 spread transversally in posterior lateral margin of segment-***A.oligorchis*** Yamaguti, 1935

REFERENCES

- Cohn L. Zur Anatomie und systematic der vagelestoden. Nova acta leop Carol 1901; 79: 263- 450.
 - Fuhrman O. Die Systematic der ordnung der Cyclophyllidea. Zool Anz 1907; 32: 289-297.
 - Meggitt FJ. Report on a colletion of the cestode mainly from Egypt. Fakily-Anoplocephalidae, Davaineidae. Parasite 1927; 19: 334-327.
 - Tseng Shen. Studies on avian cestodes from China, Part-I, Cestodes from Chardriiform birds. Parasit 1932; 24: 87- 106.
 - Yamaguti S. Studies on the helminth fauna of Japan, Part 7. Cestodes of Birds. I Jap J Zool 1935; 6: 183-232.
 - Shinde GB. New avian cestodes of the genus *Amoebotaenia* Cohn, 1900 in India. Marath Uni J Sci 1972; 11 (4): 5-15.
 - Kalayankar SD, Palladwar VD. A new species of avian cestode of genus *Amoebotaenia* Cohn, 1900 (Dilepididae.; Dilepidinae) from India. Annales de la facultad de veterinaria de Lenon 1977; 21: 27-37.
 - Gaikwad PM, Shinde GB. Report of the cestodes in a bird, Kingfisher at Aurangabad India. Nat Sci J Mar Univ Aurangabad 1977; 16 (9): 138-140.
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9. Ghare, Shinde, Suryawanshi. Some avian cestodes from Maharashtra region. *Riv Pravit* 1979; 2(46): 141-152.
10. Jadhav BV, Khadap RM, Pawar RG. A new species of the genus *Amoebotaenia* (Cohn, 1900) from *Gallus domesticus* at Aurangabad (M.S.). *National J Life Sci* 2004; 1(2): 309-311.
11. Khadap RM, Jadhav BV, Pawar RG. A new species of genus *Amoebotaenia* (Cohn, 1900) from *gallus domesticus* at Aurangabad. *Indian J Helminth* 2005; 23: 31-34.
12. Cohn L. Untersuchgen ueber zentrale nerous system der. Cestodan Zool J B Abt Anat U Ontog 1889; 12: 89-158.
13. Garad VB, Nanware SS. Taxonomic studies on cestode genus *Amoebotaenia* Cohn, 1900, (Cestoda: Dilepididae) from *Venellus malbaricus* with description of a new species. *Asian J Animal Sci* 2010; 5 (1):14-16.
14. Nanware SS, Dhondge RM, Bhure DB. Bio-systematic Studies on *Amoebotaenia minuta* sp. Nov. (Cestoda: Dilepididae) from *Vanellus malbaricus*. *Recent Res Sci Technol* 2011; 3(9):01-04.
15. Yamaguti S. *Systema Helminthum, Cestodes of Vertebrates*. London, New York: Inter Science Publishers; 1958, p 1.
16. Cohn L. Zur Anatomie der Vogelcestoden. I *Z Wiss Zool* 1900; 6: 155-290.

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