

A new Anoplocephalidea cestode (Cholodkovsky, 1902) of genus *Moniezia* from *Ovis bharal* from Aurangabad District, M.S. India

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Abstract This paper contains description of *M. roshanensis*, a new species of genus *Moniezia* (Blanchard, 1891). This new species differs from earlier reported species in having large square scolex with four suckers, testes 235 – 245 (238); ovary large inverted horse shoe shaped, interproglottidal glands 30-33 and arranged lineally.

Keywords: Cestode parasite, *Moniezia roshanensis* Sp. Nov., *Ovis bharal*, Aurangabad, interproglottidal glands.

Introduction

Sheeps and Goats are important livestock in India due to their great nutritional and economic value. The gastrointestinal cestode infections are very common and its impact is more in subtropical areas of the world especially in India because of presence of diverse range of agronomical and ecological factors suitable for different hosts and parasite species. These cestode parasites causes great loss by lowering fertility, reduction in food intake, reduction in milk and meat production, reduction in weight of host and even affect mortality in heavily parasitized animals. Hence the study of helminth parasites needed today.

Moniezia genus was erected by Blanchard, 1891 as type species *Moniezia expansa* genus was divided in to three sub-genera by Skrjabin and Schulz (1937) as:

- 1] Inter proglottidal glands in rosettes- - - - -
Moniezia.
- 2] Inter proglottidal glands linearly arranged (occasionally absent) - - -*Blanchariezia*.
- 3] Inter proglottidal glands not present----
Baeriezia.

The new cestode confirms in all characters, with subgenus *Blanchariezia*, [28] Skrjabin and Schulz (1937) having two species as *M. (B.) benedeni* [26] (Moniez, 1879), Skrjabin and Schulz (1937) and *M. (B.) pallida* Monning, 1926. Two species were added by Shinde et al. (1985) [25], collected from *Ovis bharal* as *M. (B.) aurangabadensis* and *M. (B.) bharalae* at Aurangabad, M.S. India. Patil et al. described *Moniezia (B.) warananagarensis* in 1997 from *capra hircus* [18]. In 1999 Kalse et al. described *Moniezia (B.) murhari* from *Capra hircus* [10]. Pokale et al. added *Moniezia (B.) caprai* in 2004 from *Capra hircus* [20]. Pawar et al. in 2004 added *Moniezia (B.) shindei* from *Ovis bharal* [19]. Tat et al. added *Moniezia (B.) hircusae*

from *Capra hircus* in 2004 [27]. Borde et al. in 2004 added *M. (B.) rajalaensis* from *Capra hircus* [6]. Later on Nanware (2010 a,b,c) added three more new species in this genus i.e. *M.(B.) caprae* [14], *M.(B.) maharashtrae* [15] and *M.(B.) kalavati* [16] from *Capra hircus*. Kasar et al. (2010) added *M. madhukarae* from *Capra hircus* [11]. Shaikh et al. (2011) added *M. (B.) mansurae* from *Capra hircus* [21]. *M. (B.) govindae* was added by Padwal and Kadam (2011) from *Capra hircus* [17]. Humbe et al., 2011 added two species i.e. *M. (B.) babai* [1] from *Capra hircus* and *M. (B.) ovisae* from *Ovis bharal* [2] Later on *Moniezia (B.) interproglottina* (Shinde et al., 2012) [23] and *Moniezia (B.) orientalis* (Shinde et al., 2013) [24] reported from *Ovis bharal*. Latest reported species are *M. (B.) devraoi* (Atul Humbe et. al., 2013) [3] and *M. (B.) marathwadensis* (Shaikh, 2015) [22] both from *Capra hircus*.

The present paper describes a new species, *M. (B.) roshanensis* collected from *Ovis bharal* at Roshangate, Aurangabad, Tq. And Dist. Aurangabad, M.S., India.

Material and Methods

Ten specimens were collected from the intestine of *Ovis bharal* at Roshangate, Aurangabad, Tq. And District Aurangabad, M. S., India. The worms were rinsed in distilled water and flattened. in 4% formalin was used as preservative. Harris Haematoxylin was used for staining. Stained slides were dehydrated in various grades of alcohol, cleared in xylol, mounted in D.P.X. Drawings were made using Camera lucida. Measurements were given in mm.

Results and Discussion

Collected cestodes were all whitish, long having scolex, immature, mature and gravid segments. Scolex is squarish longer than broad and measures 1.1038 -1.1603 × 0.803 -0.018 and bears four

rounded suckers in pairs, round in shape measures 0.357-0.375 in diameter. Neck measures 2.982 X 0.339-0.624.

Mature segments were 6-7 times broader than long, craspedote, having two set of reproductive organs measuring 0.829 - 1.203 × 6.1305 - 6.539. Medium size testes, round shaped scattered in the central 1/3rd of the segment, not extending beyond the excretory canals on each side 235 - 245 (238) in number and measures 0.057 - 0.102 in diameter. Cirrus pouch large, elongated, directed anteriorly and measures 0.341 - 0.409 × 0.079 - 0.136. Cirrus zig-zag contained inside cirrus pouch, measuring 0.431 - 0.568 × 0.001; vas deferens coiled or not, thin and directed anteriorly and measures 0.215 - 0.225 × 0.011. Ovary large, inverted horse shoe shaped, indistinctly bilobed, anterior to middle of segment with numerous blunt acini, not extending beyond the excretory canal on each side and measures 0.170 - 0.281 × 1.158 - 1.192. Vagina is thin tube forming receptaculum seminis and measuring 0.659 - 0.795 × 0.170 - 0.281 which is posterior to cirrus pouch. Receptaculum seminis spindle shaped and measuring 0.281 - 0.363 × 0.034 - 0.011. Ootype rounded medium in size, post-ovarian and measures 0.045 - 0.056 in diameter. Genital atrium large, oval, bilateral, measures 0.102 - 0.159 × 0.125 to 0.182. Genital pores oval, bilateral measures 0.034 - 0.056 × 0.011 - 0.159. Vitelline gland large, globular, post ovarian with 4-5 blunt acini and measures 0.247 - 0.270 × 0.159 - 0.193. Interproglottidal glands large, oval, in the intersegmental region, arranged in two rows, 30-33 in number and measures 0.102-0.170 × 0.080-0.137. Gravid segments large, squareish, completely filled with reticulate uterus and measures 1.428-2.409 × 5.194-5.261. A pair of longitudinal excretory canal is present which measures 0.102-0.113 in width

Discussion

The present Cestode under discussion in having Scolex simple, medium in size, squarish in shape; mature segments large, 6-7 times broader than long; testes 235-245 (238) in number, medium, round; cirrus pouch medium to large, oval; vas deferens thin, coiled; inverted horse-shoe shaped large ovary; vagina medium in width, posterior to cirrus pouch; genital pores small, oval, bilateral; interproglottidal glands arranged lineally; 30-33 in number, and reported from sheep *Ovis bharal*

The species under discussion comes closer to most of the described species of the genus *Moniezia* in general but differs in certain aspects: After surveying the literature, the worm under discussion in having testes 235 - 235 (238) comes closer to *M. pallid*, *M. bharalae*, *M. warananagarensis*, *M. caprai*, *M. shindei*, *M. rajalaensis*, *M. madhukarae*, *M. babai* and *M. marathwadensis*.

i) The present worm, differs from *Moniezia* (B.) *pallida* (Monning, 1926) which is having squarish

mature segment; testes 100-200 in numbers; variable sized interproglottidal glands; cylindrical cirrus pouch, vagina lies anterior to cirrus pouch; found in South African horse [13].

ii) The present specimen shows variation from *Moniezia* (B.) *bharalae* (Shinde et al., 1985) which has 190-200 round testes; Vas deferens, fusiform and short; bilateral and sub marginal genital pores, bilobed ovary; interproglottidal glands 38-44, small, two rows; small, oval obliquely placed cirrus pouch; vitelline gland absent, vagina anterior to cirrus pouch and collected from *Ovis bharal* in India [25].

iii) The present specimen varies from *Moniezia* (B.) *warananagarensis* (Patil et al., 1997) which is having large scolex; 300 - 320 testes spread all over the segments in single field; ovary bilobed with 13 - 15 short blunt acini; medium sized interproglottid glands, 56 in number; small, oval, cirrus pouch; elongated, obliquely placed vitelline gland [18].

iv) The cestode under discussion differs from *Moniezia* (B.) *caprai* (Pokale et al., 2004), which is having medium sized, squarish scolex; 255 -260 follicular testes; horse-shoe shaped ovary; 15 to 17 pairs of interproglottid glands; flask-shaped cirrus pouch [20].

v) The cestode under discussion differs from *Moniezia* (B.) *shindei* (Pawar et al., 2004), which is having large scolex, craspedote mature proglottid; 190-200 testes scattered all over; medium sized interproglottid glands; 76 in count; large vitelline gland; small vagina; from *Ovis bharal* in India [19].

vi) The present worm differs from *Moniezia* (B) *rajalaensis* (Borde et al., 2004) in having globular scolex; 250 - 260 testes; ovary horse-shoe shaped and inter proglottid glands 31 - 32 in numbers [6].

vii) Presently discussed cestode differs from *Moniezia* (B.) *madhukarae* (Kasar et al., 2010) which is having simple, elongated scolex; long neck; mature proglottid, 5 - 6 times broader than long, medium, oval testes; 210 - 240 scattered in posterior part of segment; oval cirrus pouch, vagina posterior to cirrus pouch; butterfly-shaped ovary; post-ovarian vitelline gland [11].

viii) The cestode under discussion differs from *Moniezia* (B) *babai* (Humbe et al., 2011) in having globular and elongated scolex, 190 - 220 testes, oval cirrus pouch and compact, rounded ovary. [1]

ix) The cestode under discussion differs from *Moniezia* (B) *marathwadensis* in having scolex quadrangular, bears four, rounded suckers, mature segment five times broader than long; testes small, oval, 125-130 in numbers; cirrus pouch large, elongated, cirrus thin tube, straight; vas deferens slightly curved, thin; ovary compact, with numerous blunt acini; vagina thin tube, posterior to cirrus; receptaculum seminis broad, open into ootype; ootype rounded, medium; vitelline gland

post ovarian, medium, rounded; interproglottidal glands 50 - 52 in numbers, arranged in double rows [22].

The species under discussion varies from the known valid species of the genus *Moniezia* in respect to taxonomic characters. Hence the species is named as *Moniezia* (B.) *roshanensis* Sp. Nov. on account of place of collection.

Taxonomic summary

Genus: *Moniezia* (Blanchard, 1891)

Species: *Moniezia* (B.) *roshanensis* n.sp..

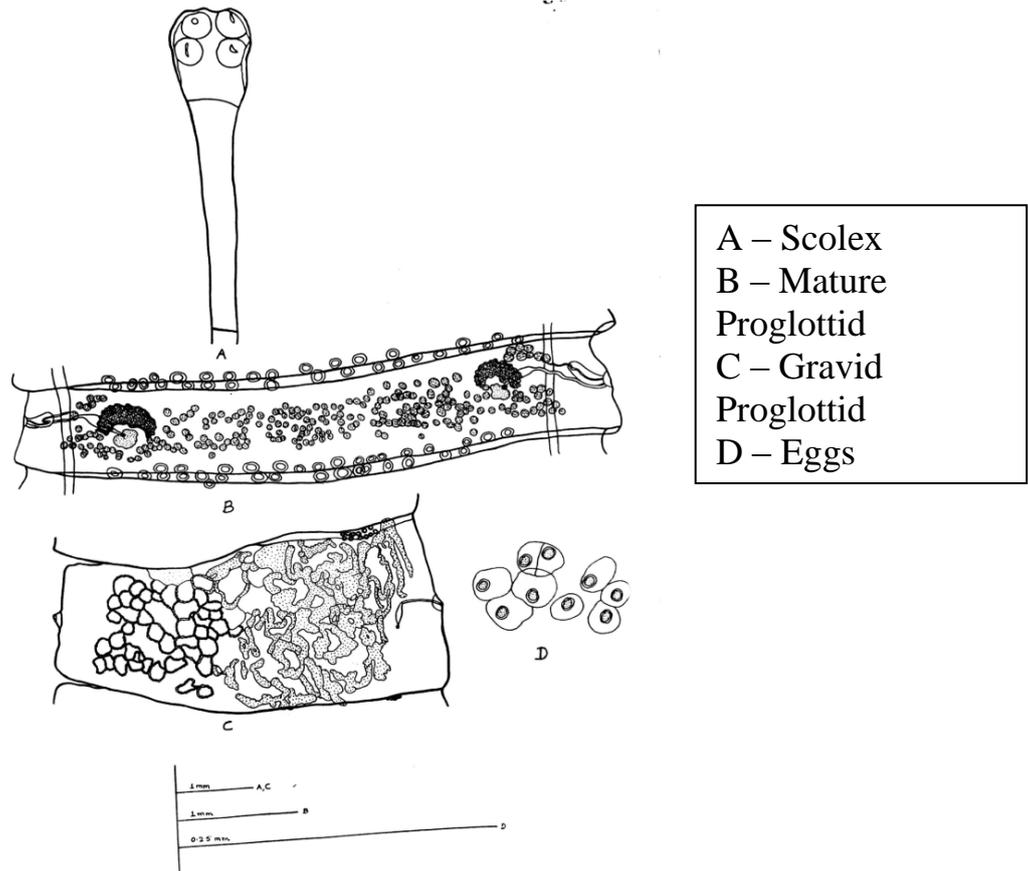
Type host: *Ovis bharal* (L.)

Habitat: Intestine

Locality: Roshangate, Aurangabad, Maharashtra State, India

Holotype: Helminth Research Lab, Department of Zoology, Dr. B. A. M. U. Aurangabad (M.S.) India.

Figure: Camera Lucida diagram of *Moniezia* (B.) *roshanensis* Sp.Nov.



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