

A TAXONOMIC STUDY OF A NEW CESTODE *COTUGNIA JADHAVII* FROM AHMEDNAGAR DISTRICT, M.S., INDIA.

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ABSTRACT

A taxonomic study of cestode parasites was carried out from *Gallus gallus domesticus* in Ahmednagar district. Twenty specimen of the cestode parasite were collected from the intestine of domestic fowl. The worms were found from the genus *Cotugnia* which was first described by Diamare. The present worm *Cotugnia jadhavii* n.sp. was compared with all the known species and found to be new in having scolex large, quadrangular, bear four unarmed suckers, mature segment broader than length with double set of reproductive organs, testes are 90-100 in number, ovary is V shaped on each side of the segment, genital pore of medium size and oval in shape.

KEY WORDS: *Cotugnia*, *Gallus domesticus*, Scolex, Taxonomic.

INTRODUCTION

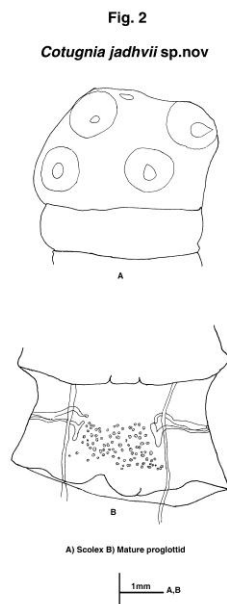
The genus *Cotugnia* was erected by Diamare in 1893, with its type species *C. digonopora* from *Gallus gallus ometicus*. So far no of species of *Cotugnia* was added to this genus. The present worm comes closer to all the known species of the genus *Cotugnia* Diamare (1893), but differs due to some other characters.

DESCRIPTION

Twenty specimens of the cestode parasites were collected from intestine of *Gallus domesticus* at Akole, Dist. Ahmednagar, M.S., India, in the period of July 2007 to June 2009. The worms are medium in size, have many segments and consist of scolex, immature, mature segments.

These cestodes were flattened, preserved in 4% formalin, stained in Harris Haematoxylin, passed through various alcoholic grades, cleared in xylol, mounted in DPX and slides were observed for further anatomical studies. The scolex is large in size, quadrangular in shape, indistinctly marked off from the strobila measuring 3.757 (3.319-4.196) in length and 4.863 (4.005-5.722) in breadth. The rostellum is small in size, oval in shape. Measuring 0.95 (0.038-0.52) in length and 0.590 (0.457-0.724) in breadth.

The scolex bears four suckers, nearly rounded in shape, large in size, unarmed, placed at corner in two pairs, one pair on each side of the scolex and measures 0.144 (0.763-1.526) in length and 1.485 (1.444-1.526) in breadth. The neck is absent. The mature segments are about 4-5 times broader than length with straight lateral margins rectangular in shape. Each mature segment bears a double set of reproductive organs and measures 3.814 (3.433-4.196) in length and 5.985 (4.722-7.248) in breadth.



The testes are 90 to 100 in number, almost rounded, (variable in size), situated in the centre of segment in between two ovaries, in a single field, evenly distributed and measures 0.114 (0.076-0.152) in diameter. The cirrus pouch on each side is long, straight, cylindrical and broader in the middle and narrow towards vas deference.

It is situated in anterior region of the segment and measures 0.171 (0.114-0.228) in length and 0.724 (0.686-0.763) in breadth. The cirrus is thin, curved tube within the cirrus pouch and measures 2.118 (2.060-2.174) in length and 0.95 (0.038-0.152) in breadth.

The 'V' shaped ovary is on each side of the segment, obliquely placed, large in size, situated towards the middle side of the segment and medial to the longitudinal excretory canals admeasuring 0.590(0.457-0.724) in length and 0.114(0.076-0.152) in breadth. The vagina is thin tube posterior to the cirrus pouch, curved, runs horizontally, cross the excretory canal, dorsal to the ovary. It reaches and opens into the ootype and measures 1.81(1.755-1.869) in length and 0.57(0.038-0.076) in breadth.

The ootype is small, rounded, posterior and measures 0.590 (0.457-0.724) in diameter. The viteline gland is medium in size and is transversely placed. The genital pore is small in size, oval in shape and measures 0.045(0.042-o.048) in length and 0.028(0.026-0.030) in breadth. Gravid segments were not found.

DISCUSSION

The genus *Cotugnia* was erected by Diamare in 1893, with its type species *C. digonopora* from *Gallus gallus domesticus*. So far no of species of *Cotugnia* was added to this genus. The present worm comes closer to all the known species of the genus *Cotugnia* Diamare (1893), but differs due to some characters from following species.

1}The present parasite, differs from *C digonopora*, Pasqual, 1890, Diamare, 1893.in having diameter of Scolex 1.56, diameter of rostellum 0.150, number of hooks very numerous, number of testes 100-150 in number, length of cirrus pouch 0.300 and reported from *Gallus gallus domesticus* in Africa, Burma, India.

2} The present parasite, differs from *C. polyacantha*, Fuhrmann, (1909) in having Scolex 0.450 in diameter, rostellum 0.220 in diameter, number of hooks 420, testes about 100 in numbers length of cirrus pouch 0.180.

3}The present parasite, differs from *C. cuneata tenuis*, Meggitt, (1924) which has Scolex rounded, number of hooks 400, number of testes 30-50 in number.

4}The present parasite, differs from *C. parva*, Baer, (1925) which has diameter of 0.49-0.68×0.69-0.85, diameter of rostellum 0.15, number of hooks 378-396, number of testes 32-41 length of cirrus pouch 0.96-0.106 and reported from *Columba livia* in Burma, India.

5}The present parasite, differ from *C. jyoeuxi*, Baer, (1925) which has diameter of Scolex 0.67, Diamter of rostellum 0.19 number of hooks 250, number of testes 30-50, in number, length of cirrus pouch 0.0075 and reported from *Turner sengalensis*, in French, Guinea.

6}The present parasite, is differ from *C. fleari*, Meggitt, (1927) which has Scolex diameter 0.45× 0.58, rostellum not mentioned, testes 28-44 in number, length of cirrus pouch 0.29-0.31 and reported in *Columba livia*, in Egypt, India.

7} The present parasite, differs from *C.bhali*, Johri, (1934) which has diameter of scolex 0.500, diameter of rostellum 0.34 and number of hooks 332,number of testes 69-74, length of cirrus pouch 0.25-0.223.

8}The present parasite, differ from *C.intermedia*, Johri, (1934) which has the diameter of 0.44-0.525, rostellum not mentioned, hooks not mentioned, hooks not mentioned, testes 69 to 74 in number, length of cirrus pouch 0.215-0.223.

9}The present cestode differs from *C. noctua*, Johri, (1934) which has the diameter of Scolex 0.570, diameter of rostellum 0.225, number of hooks not mentioned, number of testes 170-182, lenthg of cirrus pouch 0.176 to 0.200.

10} The present parasite, differs from *C. taiwanensis*, Yamaguti, 1935.in presence of diameter of Scolex 0.51 to 0.740, diameter of rostellum 0.440, number of hooks about 200, number of testes 12-13, and reported in Indochina, India.

11} The present parasite, differ from *C.magna*, Burt, 1940, in having diameter of Scolex 0.580-0.620, diameter of rostellum 0.285-0.315, number of hooks 480-500, number of testes 150 and reported from *Columba livia* in Ceylon.

12} The present parasite, differs from *C. columbae*, Shinde, 1969, in presence of diameter of Scolex 0.54-0.74, diameter of rostellum 0.447,number of hooks about 1200, number of testes 12-14, length of cirrus pouch 0.3, ovary bilobed.

13} The present parasite, differs *C. aurangabadensis*, Shinde, 1969, in presence of diameter Scolex broad 0.483, diameter of rostellum 0.300 (flat), number of hooks about 500 in two rows, number of testes 80-90, cirrus pouch 1.30×1.040, ovary compact.

14}The present parasite, differs *C. shrivastavi*, Malviya and Dutta, 1970, in presence of diameter of Scolex 0.726 diamter of rostellum 0.446, number of testes 80-85.

15} The present parasite, differs *C. magdoubii*, Megzoubi and Kasim, 1980, in presence of diameter of Scolex 0.44-0.55, diameter of rostellum 0.25-0.55, number of testes not mentioned, length of cirrus pouch 0.15-0.18.

16} The present worm, differs from *C. satpulisensis*, Shinde *et al.*1983, in presence of diameter of Scolex 0.535, diameter of rostellum 0.230, number of hooks 337, number of testes 43-52.

- 17} The present worm differs from *C. yamaguti*, Shinde *et al.*, 1985, in presence of diameter of Scolex globular, rostellum rounded, number of hooks about 500, number of testes 190-200, ovary bilobed.
- 18} The present worm, differs from *C. kamatiensis*, Kharade and Shinde, 1995, number of hooks 200-210, number of testes 95-105, ovary bilobed.
- 19} The present parasite, differs from *C. chaingang aii* Wongsad *et al.*, 1998, in presence of number of hooks numerous, number of testes 30-35, ovary bilobed.
- 20} The present parasite, differs from *C. manishae*, Shinde *et al.*, 1999, in presence of diameter of Scolex 0.462×0.485, diameter of rostellum 0.223×0.227, number of hooks 110-120, number of testes 85-90 (90).
- 21} The present parasite, differs *C. ganguae*, Shinde *et al.* 1999, in presence of number of hooks 275-300, number of testes 155-160, ovary bilobed.
- 22} The present parasite, differs from *C. mehdi*, Mahajan *et al.*, 1999, in presence of diameter of Scolex 0.985×1.576, diameter of rostellum 0.129×0.182, number of hooks 110, number of testes 140-150.
- 23} The present parasite, differs from *C. alii*, Shinde *et al.*, 2002, in presence of diameter of Scolex 0.450-0.456×0.636-0.657, number of hooks 100-110, number of testes 80-85.
- 24} The present parasite, differs *C. sillodensis*, Jadhav *et al.*, 2003. Number of hooks 220-250, number of testes 165-175, ovary irregular median.
- 25} The present parasite, differs from *C. singhi*, Pawar *et al.*, 2004, in presence number of hooks 200-210, number of testes 65-70, ovary is irregular.
- 26} The present parasite, differs from *C. lohanesis*, Jadhav *et al.* 2004, in presence of shape of Scolex, number of hooks 190 to 210 in number of testes 28-30, ovary bilobed.
- 27} The present parasite, differs from *C. rimondoi*, Tubandui Masilungan *et al.*, 1937, in having number of testes about 100-136 and reported in *Columba livia* in Philippines.
- 28} The present cestode, differs from *C. rajivji*, Jadhav *et al.* 1994, in presence of diameter of Scolex oval, 0.62-1.004, diameter of rostellum 0.37-0.44, number of hooks 350-400, cirrus pouch 0.280-0.282, ovary bilobed.
- 29} The present parasite, differs from *C. shankari*, Tat and Jadhav. 2005 in presence of 0.947-1.000×0.955-0.092×0.182-0.213, number of hooks 105-205, number of testes 27-40, length of cirrus pouch 0.098-0.030, ovary bilobed.
- 30} The present parasite, differs from *C. liviae*, Patil *et al.*, 2005 in presence of diameter of Scolex 0.369×0.359-0.437 mm, diameter of rostellum 0.175-0.0189×0.097-0.131, number of hooks 250-270, number of testes 120-125 (123), length of cirrus pouch 0.225×0.068.
- 31} The present parasite, differs from the *streptopelia*, Jadhav, *et al.* 2009 is differs from Scolex longer than broad 8.04-5.36×9.82-5.36 quadrangular, diameter of rostellum 2.58-2.14×1.96-1.25, number of hooks numerous, number of testes 27-30 ovary compact, almost bilobed 5.36-4.46×5.54-4.46, vitelline gland post ovarian, oval 1.79-1.43×1.61-1.43.
- 32} The present parasite, differs from *C. Hafeezii*, Nanaware *et al.* 2010 in diameter of Scolex 1.2245×1.086×0.996-1.176, quadrangular, diameter of rostellum 0.95×0.317, number of hooks 55-60, number of testes 150-160.
- 33} The parasite differs from *C. Indiana*, Kasar *et al.* 2010 from diameter of Scolex square, number of hooks 110-120 number of testes 115-120.
- 34} The present parasite, differs from *C. tetragona*, Nanaware *et al.* 2011 in presence of Scolex tetragonal 927(0.688-1.666) x 0.773(0.667-0.879), diameter of rostellum 0.280 (0.212-0.349) x 0.450, number of hooks 120-130, number of testes 60-70, length of cirrus pouch 0.185, ovary bilobed, vitelline gland round.
- 35} The present parasite, differs from *Cotugnia mohekarii* sp. Nov, Shukla *et al.* 2012 is having shape of scolex quadrangular, rostellum is oval, hooks absent, number of testes 63(60-65), length of cirrus pouch 0.534(0.533-0.535), genital pore oval, ovary oval, vagina long tube, posterior to cirrus pouch.

The above noted characters of this parasite are valid enough to erect a new species hence the name of the new species is proposed the *Cotugnia jadhavii* sp. nov. the name is given after Late Dr. B.V. Jadhav well-known helminthologist in India had contributed a lot in our knowledge of cestodology.

Taxonomic Summary

Genus	<i>Cotugnia</i> Diamare, 1893
Species	<i>jadhavii</i> Sp. Nov.
Type host	<i>Gallus gallus domesticus</i> (Linnaeus, 1758)
Habitat	Intestine
Type locality	Ahmednagar dist. (M.S.) India
Period	July 2007 to June 2009
Etymology	As the cestode species reported from Ahmednagar (M.S.) India.

REFERENCES

- Baer J.C. (1924).** Contribution fauna Helminthologian sub africanae Note Preliminaire. *Ann. Par.* 2: 239-247.
- Burt D.R. (1940).** New avian Cestodes of family Davaineidae from Ceylon. *Ceylon J. Sci.* 22:65-77.

- Diamare V. (1893).** Note sur cestode. *Bull. Soc. Nature. Nepoli.* **7:** 9-13.
- Fuhrmann O. (1908).** Cestodan der Vogel Zool Jahrb. Suppl. **10:**232 pp.
- Johri L.N. (1934).** Report on a collection of Cestodes from Lucknow. *Rect. Ind. Mus.* **36:** 135-177.
- Jadhav B. V., Khadap R. M. and Thorat B. S. (2003).** A new species of the genus *Cotugnia* Diamare, 1893) from *Gallus domesticus* at Sillod, Dist. Aurangabad (M.S.) India. *Ind. J. Helminthol.* **21:** 71-75.
- Jadhav B. V., Kadam M. N., Bawane V. S. and Nanware S. S. (1994).** A new cestode *Cotugnia rajivji* sp. nov. from *Columba livia* at Hyderabad A.P. India. Abstract XIth National Congress of parasitology, Mohanlal Sukhadia Uni. Udaypur (Feb) 22-24, 1994 Ab.No. PS – 1.8 pp. 6-7.
- Jadhav B. V. and Gore G. D. (2004).** A new species of genus *Cotugnia* (Diamare, 1813) from pigeon, *Columba livia* at Loha, India. *Nat. J. Life Sci.* **1(1):** 181-182.
- Jadhav G. P., Makne H. D., Pawar D. D. and Pawar S. B. (2009).** A new species of genus *Cotugnia* Diamare, 1893 (Eucestoda: Davaineidae) from *Streptopelia decacto* Maharashtra, India. *Asian J. Anim. Sci.* **4(2):** 209-212.
- Kasar C.R., Bhure D.B., Nanaware S.S., Sonune M.B. (2010).** Taxonomic observation of *Cotugnia* Indiana sp.nov. (Cestoda ; Davaineidae, Fuhrmann 1907) from *Columbia livia*. *Asian J. Anim. Sci.* **5(2):**193-198.
- Kharade S. V. and Shinde G. B. (1995).** On a new species of *Cotugnia* Diamare, 1893 (Cestoda: Davaineidae) from *Gallus domesticus*. *Riv. Di Parasitol.* **12:** 345-347.
- Magzoubi M., Kasim A. B. and Shawa Y. (1980).** Three new species (Cestode: Davaineidae) from the rock Pigeon *Columba livia domestica* with comments of infection. *J. G. Coll. Sci. Univ. Riyadh.* **11:** 119-127.
- Mahajan P. A. 1999.** One new species of the genus *Cotugnia*,Diamare, 1893(Cestoda: Davaineidae) as *C. mehdi* ns.p. from *Gallus domesticus* at Aurangabad. *Riv. Di. Parasitol.* **16:**142-147.
- Malhotra S.K. and Capoor V.N. (1983).** A new cestode *Cotugnia satpulensis* n.sp. from *Columbia livia domestica* and *Columbia livia intermedia* from India. *Acta Parasitol. Polonica.* **28(28/52):** 393-397.
- Malviya H. C. and Dutta S. C. (1970).** Morphology and Life history of *Cotugnia srivasavi* n.sp. (Cestoda: Davaineidae) from domestic pigeon. In Srivastava commemoration volume (Singh, K.S. and Tondon, B.K. (Eds). Indian veterinary Research Institute, Izatnagar, pp. 103-108.
- Meggitt F. J. (1924).** Tapeworms of Rangoon pigeon. *Parasit.* **16:** 303- 312.
- Meggitt F. J. (1927).** A list of cestode collected in Rangun during the year 1923-1926. *J. Burma Res. Sci.* **16:** 200-210.
- Meggitt F. J. (1927).** Report on a collection of the cestode mainly from Egypt. Family-Anoplocephalidae, Davaineidae. *Parasite.* **19:** 334-327.
- Nanware S. S., Dhondge R. M. and Bhure D. B. (2010).** *Cotugnia hafeezi* Sp. Nov. (Cestoda: Davaineidae, Fuhrmann 1907) from *Gallus gallus domesticus*. *Ecosphere.* **1(1):** 118-124.
- Nanware S. S., Dhondge R. M. and Bhure D. B. (2011).** Biosystematic studies on *Cotugnia tetragonia* sp.nov. (Cestoda: Davaineidae) from *Columba livia*. *Rec. Res. Sci. Tech.* **308:**12.
- Pasquale 1890.** (Cestoda: Davaineidae) Part V nervous system. *Parasiten.* **21:** 101-112.
- Patil A. S., Lakhe A. D., Pawar S. B. and Shinde G. B. (2005).** A new cestode *Cotugnia liviae* n.sp. (Eucestoda: Davaineidae) Diamare, 1893 from *Columba livia* at Ambajogai, Maharashtra. *Uttar Pradesh J. Zool.* **25(2):** 221-223.
- Pawar S. B., Shinde G. B. and Garad V. B. (2004).** A new cestode *Cotugnia singhii* n.sp. (Eucestoda: Davaineidae) from *Columba livia* at Aurangabad, M.S. India. *Uttar Pradesh J. Zool.* **24(2):** 104-106.
- Shinde G. B. 1969.** A known and two new species of the genus *Cotugnia*, Diamare, 1893, from the Columbiformes birds in Maharashtra, India. *Rev.Di Parasitol.* **30(1):** 39-44.
- Shinde G. B., Jadhav B. V. and Kadam S. S. 1985.** Some avian cestodes from Maharashtra Region. *Riv. Di Prasitol.* **2(46):** 141-152.
- Shinde G. B., Kolpuke M. N. and Begum I. J. (1999a).** *Cotugnia ganguae* n.sp. (Cestoda: Davaineidae) from *Corvus splendens*. *Uttar Pradesh J. Zool.* **19(2):** 127-129.
- Shinde G. B., Mahajan P. A. and Begum I. J. 1999b.** One new species of the genus *Cotugnia* Diamare 1893 (Cestoda: Davaineidae) as *C. manishae* n.sp. from *Columba livia* at Amravati M.S. India. *Rivista Di Parasitol.* **35:** 182-187.
- Shinde G. B., Pawar S. B. and Garad V. B. 2002.** A new cestode *Cotugnia alii* n.sp. (Eucestoda: Davaineidae) from *Columba livia* at Yermala M.S. India. *Uttar Pradesh J. Zool.* **22(1):** 105-107.
- Shukla S.J., Bhavare V.V., Borde S.N. and Mohekar A.D. (2012).** A new cestode parasite from the genus *Cotugnia* from Ahmednagar district M.S. India. *Int. Multidiscip. Res. J.* **2(4):**04-07.
- Spassky A. A. (1984).**The taxonomic composition of genus *Cotugnia* (Cestoda: Davaineidea). *Izvestiga Akademii Naukmoldvskoi SSR Biologicheshikh I. Nauk.* **6:** 46-53.
- Tat M. B. and Jadhav B. V. (2005).** New species of the genus *Cotugnia* (Diamare, 1893) from *Columba livia*. *Nat. J. Life Sci.* **2:** 251-254.
- Tubangui M. A. and Masilungan V. A. (1937).** Tapeworm parasites of Phillipine birds. *Phillippine J. Sci.* **62:** 409-438.
- Wongsawod C and Jadhav B.V. 1998;** A new tapeworm from *Gallus gallus domesticus* from Thailand. *Riv. Di Parasitol.* **15:**(109).
- Yamaguti S. (1935a).** Studies on the helminth fauna of Japan part 7, cestodes of birds. *J. Japan. Zool.* **6:** 189-232.
- Yamaguti S. (1935b).** Studies on the helminth fauna of Japan. Part- I. Cestodes of birds. I. *Japan. J. Zool.* **6:**1-112.