IJRAR.ORG E-ISSN: 2348-1269, P-ISSN: 2349-5138

INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS (IJRAR) | IJRAR.ORG

An International Open Access, Peer-reviewed, Refereed Journal

"MORPHOTAXONOMIC STUDIES ON A NEW CESTODE OF THE GENUS *COTUGNIA* DIAMARE, 1893 FROM *GALLUS DOMESTICUS*"

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ABSTRACT

Present investigation deals with a new species of the genus *Cotugnia*, Diamare 1893 from the intestine of *Gallus domesticus*, from Loha, Naigaon, District Nanded (M.S.), India. The new species *Cotugnia multicapsulata* Sp.Nov. comes closer to all known species of the genus *Cotugnia* in general topography of organ but differs due to scolex quadrangular, suckers four, oval to rounded, arranged at four corners, rostellum oval, placed in central region of scolex and having rostellar ring, Rostellar hooks 16-18 in numbers, arranged in a single circle, neck short, mature progloltids two times broader than long, testes 55-60 in numbers, oval to rounded, Cirrus pouch cylindrical, pyriformed, Cirrus short, coilded tube contained within the cirrus pouch, vas deferens thin tube, vagina posterior to the cirrus pouch, and ovary '8' shaped.

Key words- Cestoda, *Cotugnia multicapsulata* Sp.Nov., Davaineidae, *Gallus domesticus.*

INTRODUCTION

Diamare (1893) erected the genus *Cotugnia* with type species *C. digonopora* (Pasquale, 1890) collected from the *Gallus gallus domesticus*. Then *C.polyacantha*, is added by Fuhrmann, in 1909. Meggitt in 1924 described *C. cuneatea tenuis*. Later on Baer, in 1925 added two species to this genus viz. *C. joyeuxi* and *C. parva*. Then *C. fleari* is described by Meggitt, 1927. Later on Johri added in 1934 three species to this genus i.e. *C. bahli*, *C. intermedia* and *C. noctua*. Then *C. taiwanensis* is added byYamaguti, 1935.

Tubangui et. Masilungan, 1937 described *C. rimandoi*. *C. magna* is added by Burt, 1940. Shinde, 1969 added two species i.e. *C. aurangabadensis* and *C. colu*mbae. Later on *C. srivastavi* is added by Malviya and Datta, 1970. Then *C. magdoubii* is described by Magzoubi and Kasim, 1980. Malhotra and Capoor, 1983 described *C. satpulensis*. *C. yamaguti* is added by Shinde, 1985. Kolluri in 1988 described *C. vishakhapatnamensis*. In 1994 *C. rajivji* is added by Jadhav et. al. Then *C. kamatiensis* is described by Kharade and Shinde, 1995. Wongsawad and Jadhav in 1998 added *C. chengmaii*. In 1999 *C. manishae* and *C. ganguae* are described by Shinde, while *C. mehdii* is added by Mahajan et al., 1999, *C. alii*, is described by Shinde et al., in 2002. Later on Jadhav et al., in 2004 added two new species to this genus i.e. *C. sillodensis* and *C. lohaensis*. While Pawar et al., 2004 added *C. singhi*. In 2005 *C.shankari* is added by Tat and Jadhav while *C. liv*iae is described by Patil et al., Later on *C.streptopelii* is added by G.P. Jadhav et al., in 2009. Nanware et al., 2010 added *C. hafezzi*. The *C. indiana* is added by Kasar et al.,

2010. Garad et al., 2010 added *C. indiana* minor. Later on in 2011 Nanware et.al added *C. tetragona* and *C.orientalis*. Sanap et al., 2011 added *C.murharii* from *Columba livia.* Shinde et.al., 2012 described *Cotugnia domestica* from *Gallus g. domesticus*. Shukla et.al.,2012 reported *C. mohekarii*. Nanware and Bhure, 2013 added Cotugnia diamarei from *Gallus g. domesticus*. Pathan et.al., 2014 described *Cotugnia osmanabadensis* from *Gallus g. domesticus*. Then Barshe et.al., 2019 reported *C. rectangulata* from *Gallus g. domsticus*. More recently Barshe et al., 2021 reported *Cotugnia pyriformis* from *Gallus domesticus*.

Later on no species has been reported to this genus. The present investigation deals with the description of *Cotugnia multicapsulata Sp.Nov.* Which is collected from the intestine of *Gallus domesticus* (Linnaeus, 1758) at different collection sites of Loha, Naigaon District Nanded (M.S.) India, during the period of February, 2018 to January, 2020.

MATERIAL AND METHODS

During the present research investigation, One Hundred Thirty Five cestode parasites were recovered from the Ninety Six intestine of *Gallus domesticus* out of Two Hundred Forty Examined During February,2018 to January, 2020. These worms were flattened, preserved in 4% formalin. The flattened parasites were washed thoroughly for several times under running tap water, stained with Harri's Haematoxylene, dehydrated in ascending grades of alcohol, cleared in xylene, mounted in Canada Balsm. Camera lucida drawings were prepared and photomicrographs were taken by trinocular computerized research microscope. All the measurements are recorded in millimeter. Collection of parasites, preservation, staining, mounting and Identification was done by standard methods (Gerald D. Schmidt, 1934; Yamaguti, S., 1959; Wardle, R.A., Mcleod, J.A. and Radinovsky, 1974; Khalil, Jones and Bray,1994).

RESULTS (Based On Eleven Specimens)

All cestode were long, creamy whitish in colour having scolex, neck, immature and mature proglottids. The scolex is quadrangular in shape, larger in size, distinctly marked off from body or strobila and measures 1.46 (0.94-1.98) x 1.18 (1.09-1.128) mm in length and breadth. Scolex bears four suckers, which are oval to round in shape, highly muscular, placed at each corners of scolex and measures 0.44 mm in diameter. Rostellum large in size, oval in shape, placed or lies in a centre of scolex. It is having rostellar rings with rostellar hooks, and measures 0.40 (0.38-0.42) x 0.43 (0.41-0.45) mm in length and breadth. Rstellar hooks are 16-18 in numbers arranged is single circle and measures 0.11 (0.09-0.13) x 0.009 (0.008-0.011) mm in length and breadth. Scolex is followed by short neck, which is slightly wider than long and measures 0.31 (0.28-0.34) x 0.68 (0.66-0.70) mm in length and breadth. Mature proglottids or segments are almost 2-3 times broader than long, medium, with convex margin, each segment is having double set of reproductive organs and measures 0.915 (0.722-1.108) mm in length and 2.636 (2.456-2.816) mm in width. Testes are 55-60 in number, oval to rounded in shape, placed at the centre of proglottids in between female reproductive organ i.e. ovary and measures 0.086 (0.074-0.098) mm in diameter. Cirrus pouch is large, cylindrical, pyriformed and measures 0.201 (0.186-0.216) mm in length and 0.138 (0.128-0.148) mm in width. Cirrus short, slightly curved tube like, contained within the cirrus pouch or sac and measures 0.208 (0.188-0.228) mm in length and 0.014 (0.013-0.015) mm in width and forms vas deferens which is long, coiled tube and measures 0.378 (0.354-0.402) mm in length and 0.019 (0.010-0.028) mm in width. Cirrus and vagina opens from the common genital pores, which is oval, marginally placed and measures 0.063 (0.058-0.068) mm in length and 0.045 (0.042-0.048) mm in width. Vagina is thin tube, opens from genital pore, posterior to cirrus pouch runs transversely and measures 0.381 (0.364-0.0398) mm in length and 0.029 (0.025-0.033) mm in width and forms receptaculum seminis, which is thin, short tube and reaches to the ootype and measures 0.158 (0.142-0.174) mm in length and 0.028 (0.023-0.033) mm in width. Ootype is small, oval, compact and measures 0.058 mm in diameter. Ovary is bilobed, ‘8’ shaped, placed at lateral side of the segment, having many blunt acini and measures 0.345 (0.214-0.476) mm in length and 0.316 (0.288-0.344) mm in width. Vitelline gland is rounded in shape, post-ovarian, compact and measures 0.184 mm in diameter. Longitudinal excretory canal present on either side of the segment and measures 0.850 (0.842-0.858) mm in length and 0.015 (0.013-0.018) mm in width.

Gravid proglottids are two times broader than long and measures 0.995 (0.922-1.068) mm in length and 1.923 (1.852-1.994) mm in width. Uterus is sac like and filled egg capsules. Egg capsules are oval to rounded, 90-100 in number, having 4-6 eggs in each capsule and measures 0.058 mm in diameter. Eggs are oval to rounded and measures 0.018 mm in diameter.

DISCUSSION

It was Diamare (1893), who erected the genus *Cotugnia* with its type species *C.digonopora* (Pasquale, 1890) collected from the domestic fowl. Subsequently, thirty six species have been added to the genus viz. *C.digonopora* (Pasquale, 1890) Diamare, 1893; *C.polyacantha* Fuhrmann, 1909; *C.cuneatea tenuis Meggitt*, 1924; *C.joyeuxi* Baer, 1925; *C.parva* Baer, 1925; *C.fleari* Meggitt, 1927; *C.bahli* Johri, 1934; *C.intermedia* Johri, 1934; *C. noctua* Johri, 1934; *C.taiwanesis*, Yamaguti, 1935; *C.rimandoi* Tubangui et. Masilungam, 1937; *C.magna* Burt, 1940; *C.aurangabadensis* Shinde, 1969; *C.columbae*, Shinde 1969; *C.srivastavi* Malviya and Datta, 1970; *C.magdoubii* Magzoubi and Kasim, 1980; *C.satpulensis* Malhotra and Capoor, 1983; *C. yamagutii* Shinde, 1985; *C. vishakhapatnamensis* Kolluri, 1988; *C.rajivji* Jadhav et.al., 1994; *C. kamatensis* Kharade and Shinde, 1995; *C.chengmaii* C. Wongsawad and Jadhav, 1988; *C.manishae* Shinde, 1999; *C. ganguae* Shinde, 1999, *C.mehdii* Mahajan et.al., 1999, *C.alii* Shinde et.al., 2002; *C. sillodensis* Jadhav et.al., 2004; *C.singhi* Pawar et.al., 2004; *C. lohaensis* Jadhav et.al., 2004; *C.shankari* Tat and Jadhav 2005; *C. liviae* Patil et.al., 2005; *C.streptopelii* G.P. Jadhav et.al 2009; *C. hafezzi* Nanware et. al., 2010; *C. indiana* Kasar et. al., 2010; *C. tetragona* Nanware et. al., 2011, *C.orientalis* Nanware et. al., 2011. *C.murharii* Sanap *et al.*, 2011, *Cotugnia domestica* Shinde *et.al.*, 2012, *C. mohekarii* Shukla et.al.,2012, *Cotugnia diamarei* Nanware and Bhure, 2013; *Cotugnia osmanabadensis* Pathan *et.al.*, 2014; *C. rectangulata* Barshe et.al.,2019*; Cotugnia pyriformis* Barshe et al., 2021.

The present form under discussion is characterized by having scolex quadrangular, suckers four, oval to rounded, arranged at four corners, rostellum oval, placed in central region of scolex and having rostellar ring, Rostellar hooks 16-18 in numbers, arranged in a single circle, neck short, mature progloltids 2 times broader than long, testes 55-60 in numbers, oval to rounded, Cirrus pouch cylindrical, pyriformed, Cirrus short, coilded tube contained within the cirrus pouch, vas deferens thin tube, vagina posterior to the cirrus pouch, and ovary '8' shaped.

The present Parasite under discussion comes closer due to some morphological characters to their genus, but varied from following species.

1) The present form *Cotugnia multicapsulata* Sp.Nov. differs from *C.digonopora* Pasquale 1890, Diamare, 1893 due to scolex 1.5mm in size, rostellum oval, 1.5 mm, Hooks numerous, testes, oval to rounded, 100-150 in numbers and cirrus sac 0.300 mm.
2) The Present form *Cotugnia multicapsulata* Sp.Nov.differs from *C.polyacontha* Fuhrmann, 1909, in having scolex 0.45 mm, rostellum 0.22 mm, Rostellar hooks 420 in numbers, testes 100 in numbers, cirrus pouch 0.180 mm and reported from intestine of *Columba livia*.
3) The present specimen *Cotugnia multicapsulata* Sp.Nov.differs from *C.cuneata* tenuis Meggitt, 1924 due to scolex rounded, 0.26 mm, Rostellum rounded, 0.12 mm and reported from *Columba livia*

4) The present Tapeworm *Cotugnia multicapsulata* Sp.Nov.differs from *C.joyeuxi* Baer, 1925; due to scolex 0.67 mm; rostellum 0.19 mm; rostellar hooks 250 in numbers; testes 30-50 in numbers; cirrus pouch 0.075 mm .
5) The *Cotugnia multicapsulata* Sp.Nov.differs from *C. parva* Baer, 1925, by possesing scolex 0.49-0.68x 0.69-0.85 mm in size; rostellum 0.15 mm; Hooks 378-396 in numbers; Testes 32-41 in numbers; cirrus pouch 0.196-0.106 mm and reported from *Columba livia.*
6) The present form *Cotugnia multicapsulata* Sp.Nov. differs from *C.fleari* Meggitt, 1927, in having Scolex 0.45-0.58 mm; Testes 28-44 in numbers; cirrus pouch 0.29-0.31mm and reported from *Columba livia*
7) The present form *Cotugnia multicapsulata* Sp.Nov. differs from *C.bhali Johri*, 1934 due to scolex 0.50 mm; rostellum 0.34 mm; rostellar hooks 332 in numbers; Testes 69-74 in numbers and cirrus pouch 0.215-0.223 mm.
8) The *Cotugnia multicapsulata* Sp.Nov.differs from *C.intermedia* Johri, 1934 in having Scolex 0.44-0.525 mm; testes 69-74 in numbers; cirrus pouch 0.215-0.225 mm.
9) The present form *Cotugnia multicapsulata* Sp.Nov. differs from *C.noctua* Johri, 1934 by having hold fast organ 0.51 mm; rostellum 0.225 mm; testes 170-182 in numbers and cirrus pouch 0.176-0.200 mm.
10) The present form *Cotugnia multicapsulata* Sp.Nov. differs from *C.taiwanensis* Yamaguti, 1935 due to scolex 0.54-0.74 mm; rostellum 0.44mm; rostellar hooks 200 in numbers; testes 12-13 in numbers and reported from intestine of *Columba livia*
11) The *Cotugnia multicapsulata* Sp.Nov. differs from *C.rimandoi* Tubangui et Masilungam, 1937 in having Rostellar hooks 300 in numbers; testes 100-136 in numbers and recovered from *Columba livia*.
12) The new form *Cotugnia multicapsulata* Sp.Nov. differs from *C.magna* Burt, 1940, in having scolex 0.58-0.62 mm; rostellum 0.285-0.315 mm; Rostellar hooks 480-500 in numbers; testes 150 in numbers; cirrus pouch 0.238-0.270mm and reported from *Columba livia*.
13) The present Tapeworms *Cotugnia multicapsulata* Sp.Nov. differs from *C.aurangabaensis* Shinde 1969, in possesing broad Scolex, 0.483 mm; flattened rostellum 0.300 mm in size; rostellar hooks 500 in numbers;, testes small in size, rounded in shape, 80-90 in numbers; Cirrus sac slender, 1.30 × 1.040 mm; Genital atrium slightly anterior to middle of the proglottid; Ovary compact and reported from *Columba livia*.
14) The present cestode *Cotugnia multicapsulata* Sp.Nov. differs from *C.columbae* Shinde, 1969, due to scolex wide, 0.54-0.74 mm; rostellum 0.447mm; rostellar hooks 1200 in numbers; testes 12-14 in numbers; cirrus pouch narrow, short, 0.3 mm; Vitelline gland absent and reported from *Columba livia*.
15) The present specimen *Cotugnia multicapsulata* Sp.Nov. differs from *C.srivastavi* Malviya and Dutta, 1970, in having scolex 0.726 mm; rostellum 0.446 mm; testes 80-85 in numbers and reported from *Columba livia*.
16) The *Cotugnia multicapsulata* Sp.Nov. differs from *C.magdoubii*, Magzoubi and Kasim, 1980, in having scolex 0.44-0.55 mm; rostellum 0.25-0.44 mm; cirrus pouch 0.15-0.18 mm and reported from the intestine of *Columba livia*.

17) *Cotugnia multicapsulata* Sp.Nov. differs from *C.satpulensis* Malhotra and Capoor, 1983, in having scolex 0.535 mm in size; rostellum 0.230 mm; hooks 337 in numbers; testes oval in shape, 43-52 in numbers; cirrus pouch 0.190-0.283 mm and reported from *Columba livia*.

18) The present worm *Cotugnia multicapsulata* Sp.Nov. differs from *C.yamagutii* Shinde et.al., 1985 in having scolex 0.51-0.60 mm in size; Rostellum rounded in shape, 0.26-0.27 mm; encircled with 500 hooks; testes oval to rounded, 190-200 in numbers; cirrus pouch 0.005-0.132 × 0.044-0.0197 mm in length and breadth and reported from *Columba livia*.

19) The present worm *Cotugnia multicapsulata* Sp.Nov. differs from *Cotugnia vishakhapatnamensis* Kolluri 1988, by having scolex 28-35 x 0.336-1.056 mm.

20) The present cestode differs from *Cotugnia rajivji* Jadhav et.al., 1994, in having scolex oval, 0.62-1.006 mm; rostellum 0.37-0.44 mm; rostellar hooks 350-400 in numbers; testes 60-65 in numbers; cirrus pouch 0.280-0.282 mm and vitelline gland small, rounded.

21) The present worm *Cotugnia multicapsulata* Sp.Nov. differs from *Cotugnia kamatensis* Kharade and Shinde, 1995, by having scolex squarish in shape, 0.84-1.00 × 0.917-1.099 mm; rostellum small, 0.018 × 0.152 mm; rostellar hooks 200-210 in numbers; testes 95-105in numbers; cirrus sac oval in shape, cylindrical, 0.005-0.60 mm and Vagina runs anterior to cirrus pouch.

22) The present tapeworm *Cotugnia multicapsulata* Sp.Nov. differs from *Cotugnia chengmaii* C.Wangsawad et.al, 1998, by having scolex 0.58 × 0.738 mm; rostellum 0.194 × 0.249 mm; testes 30-35 in numbers, oval, cirrus sac 0.32 × 0.043 mm.

23) The present worm *Cotugnia multicapsulata* Sp.Nov. differs from *C.manishae* Shinde et.al., 1999, in having scolex 0.485 mm; rostellum 0.22 × 0.227 mm; hooks 110-120 in numbers; testes 85-90 in numbers; cirrus pouch 0.083-0.121 × 0.030-0.038 mm;, Ovary oval; Vitelline gland oval to triangular and collected from *Columba livia*.

24) The present cestode differs from *Cotugnia ganguae* Shinde et.al, 1999, in having scolex 0.529×0.636mm; rostellum 0.189 × 0.216 mm; rostellar hooks 275-300 in numbers; testes 155-160 in numbers; cirrus pouch 0.260 mm in length and reported from *Corvus splendens*.

25) The present new form *Cotugnia rectangulata* Sp.Nov. differs from *Cotugnia mehdii* Mahajan et.al., 1999, in having scolex 0.985 × 1.516 mm; rostellum 0.129 × 0.182 mm; 110 rostellar hooks; testes 140-150 in numbers and cirrus sac elongated, 0.530 mm.

26) The present worm *Cotugnia multicapsulata* Sp.Nov.differs from *Cotugnia alii*, Shinde et.al. 2002, in having scolex 0.450-0.436 × 0.639-0.657 mm; rostellum 0.279 × 0.436-0.315 mm; rostellar hooks 100-110 in numbers; 80-85 testes; cirrus pouch 0.241-0.191 × 0.029-0.024 mm; vas deferens 0.097-0.072 × 0.004 mm; ovary 0.265-0.241 × 0.051-0.067 mm and reported from *Columba livia*.

27) The present form *Cotugnia multicapsulata* Sp.Nov. differs from *Cotugnia sillodensis* Jadhav et.al. 2003, in having scolex 0.851-1.192 × 1.192-1.395 mm; rostellum 0.170 × 0.281 mm; 220-250 rostellar hooks; cirrus pouch 0.067-0.092 × 0.035 mm; ovary irregular, medium and Vitelline gland small.

28) The *Cotugnia multicapsulata* Sp.Nov.differs from *Cotugnia singhi* Pawar S.B. et.al., 2004, due to scolex 0.363 × 0.436-0.417 mm in size; rostellum 0.154 × 0.255-0.215 mm; encircled with 200-210 rostellar hooks; testes oval, 65-70 in numbers; cirrus sac 0.229-0.159 × 0.033-0.024 mm and Ovary 'H' shaped.

29) The present form *Cotugnia multicapsulata* Sp.Nov. differs from *Cotugnia lohaensis*, Jadhav et.al., 2004 by having scolex 0.590-0.660 × 0.471-0.757 mm; rostellum 0.227 × 0.242 mm; 190-210 rostellar hooks; testes 28-30 in numbers; cirrus pouch 0.086-0.097 × 0.004-0.009 mm and reported from *Columba livia*.

30) The present worm *Cotugnia multicapsulata* Sp.Nov. differs from *C.shankari* Tat and Jadhav, 2005, by having scolex 0.947-1.000 × 0.955-1.175 mm; rostellum 0.049-0.092 × 0.182-0.213 mm, hooks 105-205 in numbers; 27-40 testes; cirrus pouch 0.098-0.030 mm and reported from *Columba livia*.

31) The present cestode *Cotugnia multicapsulata* Sp.Nov. differs from *C.liviae* Patil et.al, 2005, in having scolex 0.369 × 0.359-0.437 mm; rostellum 0.175-0.0189× 0.097-0.131 mm; 250-270 rostellar hooks; testes 120-125 (123) in numbers; cirrus pouch 0.225 × 0.068 mm and reported from intestine of *Columba livia*.

32) The *Cotugnia multicapsulata* Sp.Nov.differs from *C. streptopelli* G.P. Jadhav et.al., 2009, by having scolex 8.04-5.36 × 9.82-5.36 mm; testes 27-30 in numbers and ovary 5.36-4.46 × 5.34-4.46 mm.

33) The present form *Cotugnia multicapsulata* Sp.Nov. differs from the *Cotugnia hafezzi* Nanware et. al.,2010 in having scolex quadrangular, 1.245 × 1.086 mm; Rostellar hooks 55-60 in numbers; 150-160 testes; cirrus pouch 0.23 × 0.11 mm and ovary butterfly shaped with irregular margin, 0.30 × 0.107 mm.

34) The present form *Cotugnia multicapsulata* Sp.Nov. differes from the *Cotugnia indiana* Kasar et. al., 2010 due to squarish hold fast organ, 0.58 × 0.54 mm; rostellar hooks 100-120 in numbers; testes rounded, 115-120 in numbers; cirrus pouch elongated, 0.189 × 0.0.079 mm; ovary 0.184 × 0.174 mm and recovered from *Columba livia*.

35) The new form *Cotugnia multicapsulata* Sp.Nov. differs from *Cotugnia indiana minor* Garad et. al., 2010 in possessing scolex squarish shaped, hooks 400-415 in numbers, neck present, medium, mature proglottid wider and testes 70-75 in numbers.

36) The present form *Cotugnia multicapsulata* Sp.Nov. differes from the *Cotugnia tetragona* Nanware et. al.,2011 due to tetragonal and large hold fast organ, 0.927 × 0.773 mm; rostellum encircled with 120-130 rostellar hooks; 60-70 testes oval in shape; cirrus pouch fusiform, 0.185 × 0.090 mm; ovary 0.190 × 0.068 mm and reported from *Columba livia*.

37) The present form *Cotugnia multicapsulata* Sp.Nov. differs from the *Cotugnia orientalis* Nanware et. al.,2011 in having scolex 1.266 (1.102-1.431) × 0.927 (0.901-0.954) mm; 110-120 Rostellar hooks; testes 45-50 in numbers; cirrus pouch 0.168 × 0.128 mm; ovary 'W' shaped, 0.291 (0.159-0.424) × 0.265 (0.212-0.318) mm and reported from *Streptopelia decacto*.

38) The present form *Cotugnia multicapsulata* Sp.Nov. differes from *Cotugnia murhari* Sanap et. al.,2011 in having scolex large, quadrangular; rostellum large, oval, with two circles of 320-330 hooks; neck medium; mature segment medium, squarish, broader than long, craspedote; testes oval, small, 70 to75(73) in number; cirrus pouch small, oval, obliquely placed; cirrus medium; ovary cylindrical, bilobed; genital pore medium,

oval, bilateral in position; vitelline gland medium, oval; longitudinal excretory canals are narrow and reported from *Columba livia*.

39) The new form differs from *Cotugnia mohekarii* Shukla et.al.,2012 in having scolex quadrangular; absence of rostellar hooks; testes 63 in number; ovary oval; ootype small, rounded and postovarian.

40) The present cestode *Cotugnia multicapsulata* Sp.Nov. differs from *Cotugnia diamarei* Nanware and Bhure 2013 due to oval hold fast organ; Rostellum lies at anterior part of scolex, rounded in shape and encircled rostellar ring with 53-55 hooks, hooks'V' shaped, located in a one circle; short neck; Mature segment wide; Testessixty two in numbers, oval to rounded in shape, postovarian in position; Cirrus sac elongated and Cirrus short, curved tube contained within cirrus pouch.

41) It differs from *Cotugnia osmanabadensis* Pathan et.al., 2014 in having scolex globular; four rounded suckers; rosetellum large and oval, rectangular with hooks; mature segments broader than long; testes 110-120 in numbers, oval to rounded and Post-ovarian; cirrus pouch large oval and elongated; cirrus short, thin and slightly curbed; vas deferens tubular, curved directed anteriorly; genital pores large oval and marginal and ovary compact, oval in shape.

42) The *Cotugnia multicapsulata* Sp.Nov. differs from *C. rectangulata* Barshe et al., 2019 due to rectangular hold fast organ, muscular suckers four in numbers, oval to rounded in shape, located in two groups, rostellum small in size, oval in shape, lies in anterior region of hold fast organ, having rostellar ring with 18-20 Rostellar hooks, mature progloltids wider, testes 75-85 in numbers, oval to rounded in shape, Cirrus sac cylindrical, Cirrus short tubular, lies within the cirrus sac, vas deferens thin, tubular and ovarian lobe bean shaped.

43) The *Cotugnia multicapsulata* Sp.Nov. differs from *C. pyriformis* Barshe et.al, 2021 in having scolex quadrangular, distinctly marked off from body, Suckers four in numbers, oval to rounded in shape, muscular, situated at four corners, Rostellum placed centrally in hold fast organ, medium, having rostellar rings with rostellar 22-24hooks, neck absent, mature progloltids five times wider than long, oval to round in shape, placed at central medula of segment, in between ovary, 60-70 in numbers, Cirrus pouch pyriform, Cirrus protrusible, lies within the cirrus sac, vas deferens thin, tubular, vagina posterior to cirrus pouch and ovary bilobed

From the above discussion it is clear that the species under discussion is new to science and differs from the known valid species of the genus *Cotugnia* in respect to taxonomic characteristics. On the basis of presence of above-mentioned differences and variations the authors are convinced to place the present form in new species viz. *Cotugnia multicapsulata* Sp.Nov. The species is named after the Multicapsulated egg.

TAXONOMIC SUMMARY

Type species : *Cotugnia multicapsulata* Sp.Nov.

Host : *Gallus domesticus,* Linnaeus, 1758.

Habitat : Intestine

Locality : Loha, Naigaon, District Nanded (M.S.), India.

Prevalence : 135 specimens collected from 96 infected host out of 240 examined.

Period of collection : February 2018 to January 2020.

No. of Specimen : 135

Accession number : PGDZ/YMN/1-11/ February 2018 to January 2020

Deposition : Research Laboratory, Department of Zoology, Yeshwant Mahavidyalya, Nanded.

Etymology : The species is named after the Multicapsulated egg.

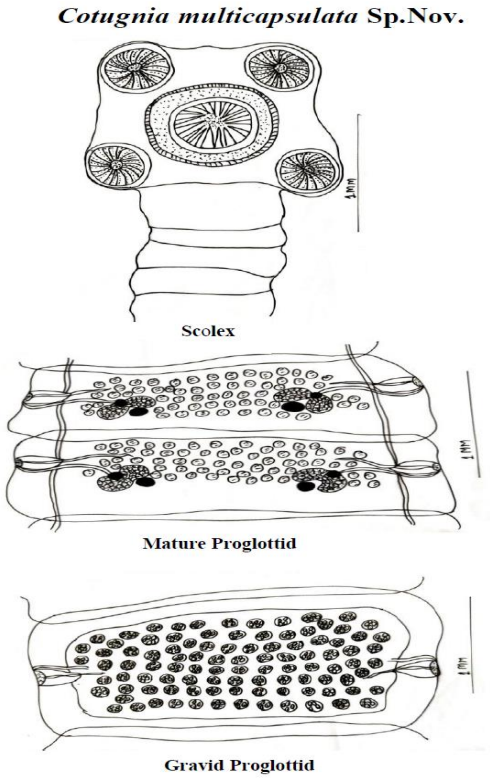

Fig.-1. Camera Lucida sketch of *Cotugnia multicapsulata* Sp.Nov.

ACKNOWLEDGEMENTS

The authors express sincere thanks to Principal, Yeshwant Mahavidyalaya Nanded for facilities provided.

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