

RAILLIETINA RAFIAE N.SP. OF THE GENUS RAILLIETINA FUHRMANN, 1920 FROM GALLUS GALLUS DOMESTICUS (COMMON CHICKEN) IN KORANGI, KARACHI, SINDH

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ABSTRACT

The present investigation deals with systematic observations of the cestode parasite *Raillietina rafiae* n.sp. in common chicken from Korangi, Karachi. Fourteen worms were collected from the small intestine, preserved in 70% alcohol, stained with Mayer's carmalum and mounted in Canada balsam, camera Lucida drawing were prepared. All the measurements are in millimeters. Size of parasite 35-65 long, 0.15-0.16 at the neck region and 1.02-1.05 at the region of mature segments and 0.87-1.5 at the gravid segments in diameter. Strobila crasperate. Scolex small, globular, in enface view flower shaped 0.20-0.21 in diameter, rostellum small, armed with tiny spines. Suckers round to oval, small 0.05-0.08 in diameter, armed with minute hooks. The hooks of outer circle smaller than inner ones, the inner measuring 0.02 while the outer 0.01 mm, in inner row 40 hooks while in the outer 48-50. Neck thicker and short nearly equal to width of head, immature and gravid segments are much broader in width. Genital pores unilateral, situated at the anterior, lateral margin of the segments. Testes rounded 24 to 26 arranged in the median field, cirrus sac flask shaped 0.14-0.19 long, vas deferens coiled in mature segments, ovary a little on poral side appears to be roughly branched and bilobed 0.23-0.25 in diameter. Uterus breaks up into egg capsules in the gravid segment, each egg capsule 0.06-0.16 in diameter and contains 8-10 small egg inside. The present species somewhat resembles *R. (R.) tetragona* but differentiates in a number of characters, thus regarded as a new species *Raillietina rafiae*.

Keywords: *Raillietina rafiae* n. sp., *Gallus gallus domesticus* (Linn., 1758), Karachi, Sindh.

INTRODUCTION

The chicken (*Gallus gallus domesticus*) is a domesticated jungle fowl species which are the most widespread domestic bird (Tregaskes and Kaufman, 2021).

Cestode infection is the most common in free range chicken maintained on green litters, bugs and other leftovers cause heavy economic loss (Jatoi *et al.*, 2018). These tapeworms cause decrease in egg production, diarrhea, weight loss, retarded growth, obstruction of the intestine, morbidity and mortality (Anwar *et al.*, 1991) in severe cases may lead to death of chicken (Butboonchoo *et al.*, 2016).

Considering the economic importance of cestodes causing disease in chicken in Sindh, the present study was conducted. The present paper deals with the morphology of a new species of *Raillietina* from Korangi, Karachi, Sindh, Pakistan.

MATERIALS AND METHODS

Twelve randomly selected free range chicken from Korangi, Karachi to the Parasitology Laboratory, euthanized as soon as possible with excess chloroform and dissected under a stereo microscope. The digestive tract was removed possibly cut into sections and cut open. Cestodes were collected from the intestine. The fourteen cestodes recovered from six birds were fixed in F.A.A. fixative under slight pressure of cover slip for 24 hours. Later, the cestodes were washed well with 70% ethanol, stained in Mayer's carmalum, dehydrated in graded series of alcohol, cleared in clove oil, rinsed with xylene and mounted permanently in Canada balsam. All measurements are given in millimeters (if not indicated otherwise). Specimens are in possession of senior author (R.M), Department of Zoology, University of Karachi.

RESULTS

Raillietina rafiae n.sp.
(Figs. 1a-d)

Host:	<i>Gallus gallus domesticus</i> (common fowl)
Locality:	Korangi, Karachi, Sindh
Site of infection:	Small intestine
Number of host examined:	12
Number of specimens recovered:	14 from 6 birds

Description is based upon fourteen scolex bearing strobila with mature and egg bearing gravid segments:

When cestodes were alive, all specimens were opaque, delicate and whitish in color. Strobila craspedate, 35-65 long; 0.15-0.16 at the neck region and 1.02-1.05 at the region of mature segments and 0.87-1.5 at the gravid segments. Scolex small, simple, globular, in enface view flower shaped, 0.20-0.21 in diameter, rostellum small, armed with double row of small hooks. The hooks of outer circle smaller than inner ones, the inner measuring 0.02 while the outer 0.01, the inner row 40 hooks while in outer row 48-50. The outer circle hooks smaller than inner ones, the inner measuring 0.02 while the outer 0.01. Suckers round or oval, small 0.05-0.08 in diameter armed with tiny hooks. Neck thicker and short nearly equal to width of head, immature, mature and gravid segments are much broader than long. Genital pores unilateral situated at the anterior, lateral margin of the segments. Testes rounded, 24 to 26 arranged in the medium field, surrounding female reproductive organs. Vas deferens lies in the anterior third of the segment, cirrus sac rather flask shaped 0.14-0.19 long by 0.040-0.044, vas deferens coiled in some mature segments. Ovary a little on the poral side in a few mature segments or in the middle of the segment, appears to be roughly branched and bi-lobed 0.23-0.25 in diameter, vagina begins at the genital pore, posterior to opening of cirrus pouch, extends transversely across the segment and joins the oviduct on dorsal side of the ovary, uterus breaks up into egg capsules in the gravid segments, each egg capsule 0.06-0.16 in diameter and contains 6-14 small eggs.

DISCUSSION

Raillietina (R.) Fuhrmann, 1920 is cosmopolitan and reported its type species *R. (R.) tetragona* in *Meleagris gallopavo*, *Gallus gallus*, *Gutters eduardo*, *Lagopus lagopus*, *L. mutus*, *Numida ptilorhynchus*, *N. meleagris*, *Pavo cristatus* and *P. muticus*. The genus *Raillietina* has been divided into four subgenera; *Raillietina* Fuhrmann, 1920, *Skrjabini* Fuhrmann, 1920, *Paroniella* Fuhrmann, 1920 and *Fuhrmann* fuhrmann, 1920 (Schmidt, 1986).

The morphological characters used in differentiating *Raillietina* spp. include size and shape of scolex, morphology of rostellum (armed with single or double row of hooks), suckers armed or unarmed, the position of genital pore and the number of egg per egg capsule (Khalil *et al.*, 2006).

Table 1. Comparative morphological features of present species and *Raillietina (R.) tetragona* Fuhrmann, 1920.

S. No.	<i>R. (R.) tetragona</i> Molin, 1858	Present species
1	Host	Fowl
2	Location	Intestine
3	Locality	Karachi
4	Scolex	0.23 in diameter
5	Shape of scolex	Oval
6	Rostellum hooks	100 minute hooks
7	Rostellar hooks rows	1
8	Suckers	Small armed with 8-10 rows of spines
9	Sucker size	—
10	Mature segments	0.2-0.25 by 1.2-1.8
11	Shape of mature and gravid segments	Not very broad
12	Testes	20-30
13	Cirrus pouch	0.086 by 0.043
14	Ovary	Irregular
15	Position of genital pore	Anterior
16	Gravid segments	2.4-2.9 by 0.45-0.51
17	Eggs capsules	100
18	No. of eggs in capsule	6-12

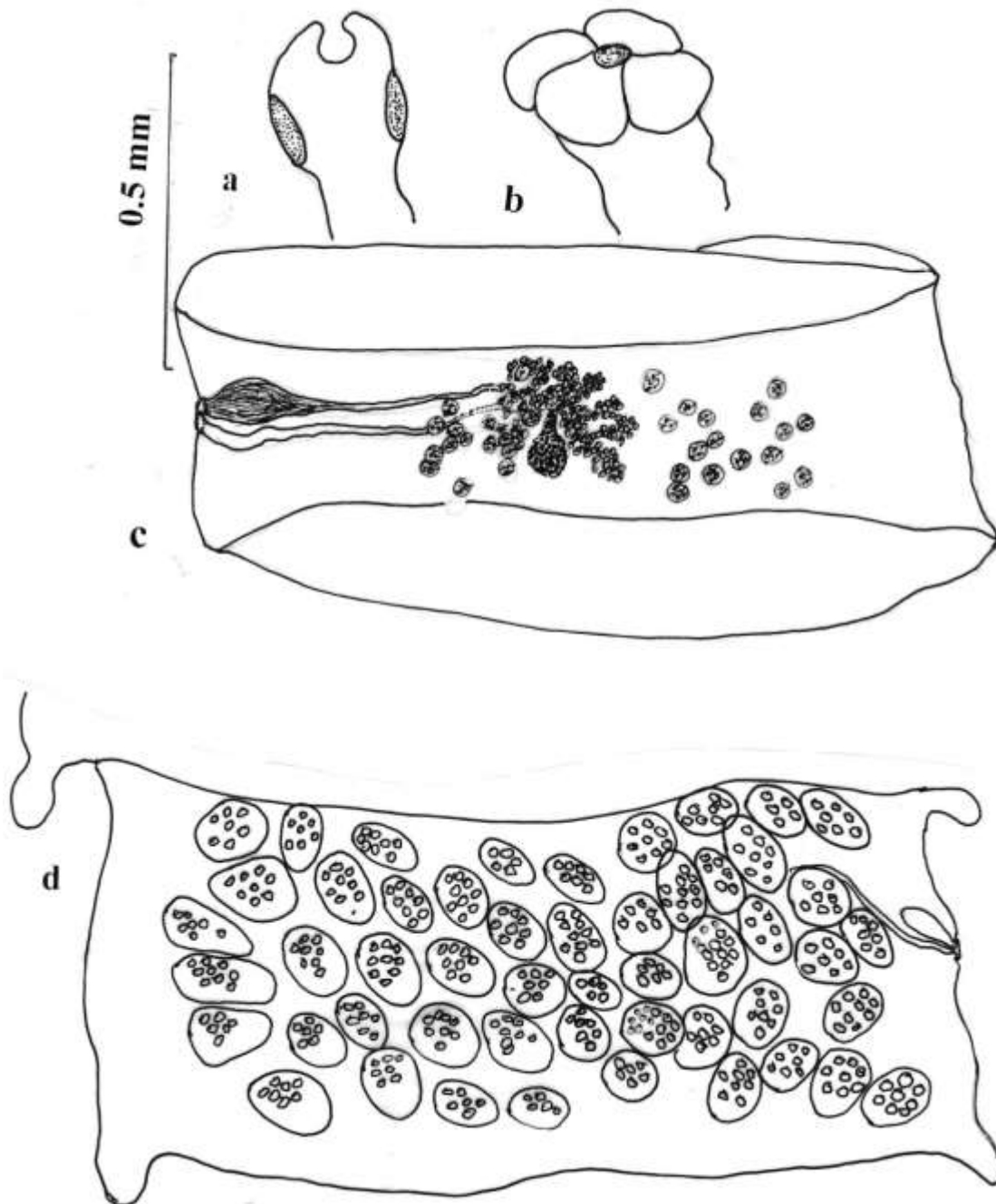


Fig. 1: *Raillietina rafiae* n.sp.

a. Scolex, **b.** Enface view of scolex, **c.** Mature segment, **d.** Gravid segment

Galliformes are the most common hosts of the genus *Raillietina* Mariaux and Georgiev (2020). Bilqees (1985) reported the following species of *Raillietina* Fuhrmann, 1920 in her checklist, namely *R. (P.) reynoldsi* Meggitt, 1926; *R. (R.) galeritae* Skrjabin, 1914; *R. (R.) flaccida* Meggitt, 1926; *R. (R.) torquata* Meggitt, 1924 ; *R. (R.) tetragona* Molin, 1858 from Pakistan. Subsequently Bushra *et al.* (2019) recorded nine species of *Raillietina* in her report on helminths of birds from Pakistan.

Deardorff *et al.* (1976) described the new species namely *Raillietina (R.) palawanensis*, *R. (R.) passeriformis* and *R. (R.) fischthali* in *Chalcophaps indica*, *Gracula religiosa palawanensis* and *Ducula aenea palawanensis*.

The present species resembles the type species *R. (R.) tetragona* but differs in shape of scolex and having much broader segments, rostellum hooks, rostellar rows, sucker hooks, shape of mature and gravid segment, ovary shape and number of egg capsules. On the basis of these differentiating characteristics, a new species is proposed. The name of new species is in honour of Dr. Rafia R. Ghazi, Ex-Director, VPCI, PARC, University of Karachi.

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