

THE ENDOPARASITES OF THE DOMESTIC PIGEON IN QUEENSLAND.

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(With Nine Text-figures.)

No internal parasites have as yet been recorded from the domestic pigeon (*Columba livia domestica*) in this State, though an examination of material collected recently in Brisbane revealed the presence of three distinct species.

FACULIFER ROSTRATUS (Buchholz).

In the tissues surrounding the pericardium and the great blood-vessels, in the subcutaneous region of the neck and also below the skin adjacent to the pectoral muscles, there were found many small whitish parasites representing the hypopial nymph stage of *F. rostratus*, a tiny Sarcoptid mite belonging to the subfamily Analginæ, which occurs in its adult condition as an epizoon infesting the barbules of the feathers.

The *Hypopus* appears to be fairly common here, but the only Australian record of its occurrence is that made by Dr. G. Sweet¹ who found it in Melbourne pigeons and published a figure and brief description.

Neumann² has also given an account of this acarid.

The same species is to be met with as an internal parasite of the pigeon in the vicinity of Sydney, N. S. Wales.

BERTIELLA DELAFONDI (Railliet).

A number of ripe segments of this rare unarmed cestode were brought to me by one of my students, but unfortunately the greater part of the pigeon's intestine had been thrown away before I had had an opportunity to obtain the remainder of the worm.

¹ G. Sweet, The Endoparasites of Australian Stock, &c., P.R.S. Vict., 21, 1908, pp.500, 523.

² L. G. Neumann, Parasites et maladies parasitaires des oiseaux domestiques, Paris, 1909, pp. 46-8, figs. 31-2.

The tapeworm has been recorded from two or three species of pigeons (including the turtle dove) from Europe [Delafond, Megnin, Railliet, Wolffhugel]; from a Brazilian species [Fuhrmann]; and from a South African pigeon [Gough³]. The present notice constitutes the first record of its occurrence in Australasia.

A brief account has been given by Megnin⁴ and Linstow⁵ under the name *Tænia sphencephala* Rud., and by Railliet⁶ who named it *Tænia delafondi*. A summary was published by Stiles⁷ but the best accounts have been given by Fuhrmann⁸ and Wolffhugel.⁹ I have not had access to the papers written by the last-named author regarding *B. delafondi* and consequently have compared my specimens with the account published by Fuhrmann who examined Railliet's original material.

Ripe segments measure 2.5 to 3.2 mm. in breadth by about one millimetre in length. The greater part of the medulla is occupied by the large uterus but the receptaculum seminis and vestiges of the ovary and vitellarium persist.

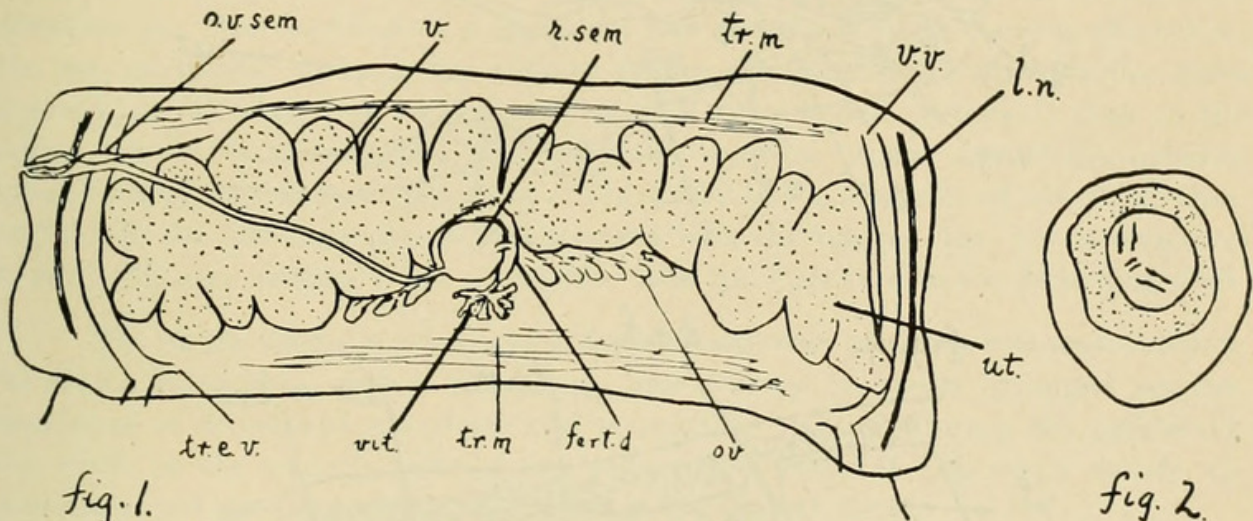


Fig. 1.—*Bertiella delafondi*. Ripe segment showing shape of uterus; also remnants of ovary. *fert.d.*, fertilising duct; *l.n.*, longitudinal nerve; *ov.*, ovary; *o.v.sem.*, outer vesicula seminalis; *r.sem.*, receptaculum seminis; *tr.e.v.*, transverse excretory vessel; *tr.m.*, transverse musculature, well developed anteriorly and posteriorly in each ripe proglottis; *ut.*, uterus; *v.* vagina; *vit.*, vitellarium; *v.v.*, ventral vessel.

Fig. 2.—Egg, showing shells and oncosphere.

³ Gough, Notes on South African Parasites, Rep. S. Afr. Assoc. 6, 1908 (1909), p. 2.

⁴ Megnin, Un nouveau Tenia du pigeon ou plutôt une espèce douteuse de Rudolphi réhabilitée, C. R. Soc. Biol., Paris (9), 3, pp. 751-3.

Linstow, Beobachtungen an Vogeltaenien, C. Bakt., 12, 1892, p. 501.

⁶ Railliet, Sur une Tænia du pigeon, &c., C. R. Soc. Biol., Paris (9), 4, pp. 49-53.

⁷ Stiles, Tapeworms of Poultry, Bull. 12, U.S.D.A., B.A.I., 1896, 88 pp.

⁸ Fuhrmann, Die Anoplocephaliden der Vogel. C. Bakt., 32, 1902, pp. 132-5.

⁹ Wolffhugel, Ein interessantes Exemplar des Taubenbandwurmes *Bertia delafondi*, Berlin tierarztl Wochenschr., 1904 (3) (not available).

The genital ducts alternate irregularly, opening near the junction of the first and second thirds of the proglottid margin. A genital papilla is absent though there is a relatively long narrow cloaca.

The musculature is strongly developed, especially the longitudinal, which occupies a considerable portion of a transverse section (figs. 3 and 4) and consists of a very large number of small closely arranged bundles forming a zone several bundles in thickness, the largest being situated most inwardly, next to the transverse fibres. The latter are particularly developed in the anterior and posterior regions of each segment (fig. 1 *tr. m.*). Dorso-ventral fibres are rather weak. Calcareous corpuscles do not appear to be abundant. They measure seven to eight micra in diameter.

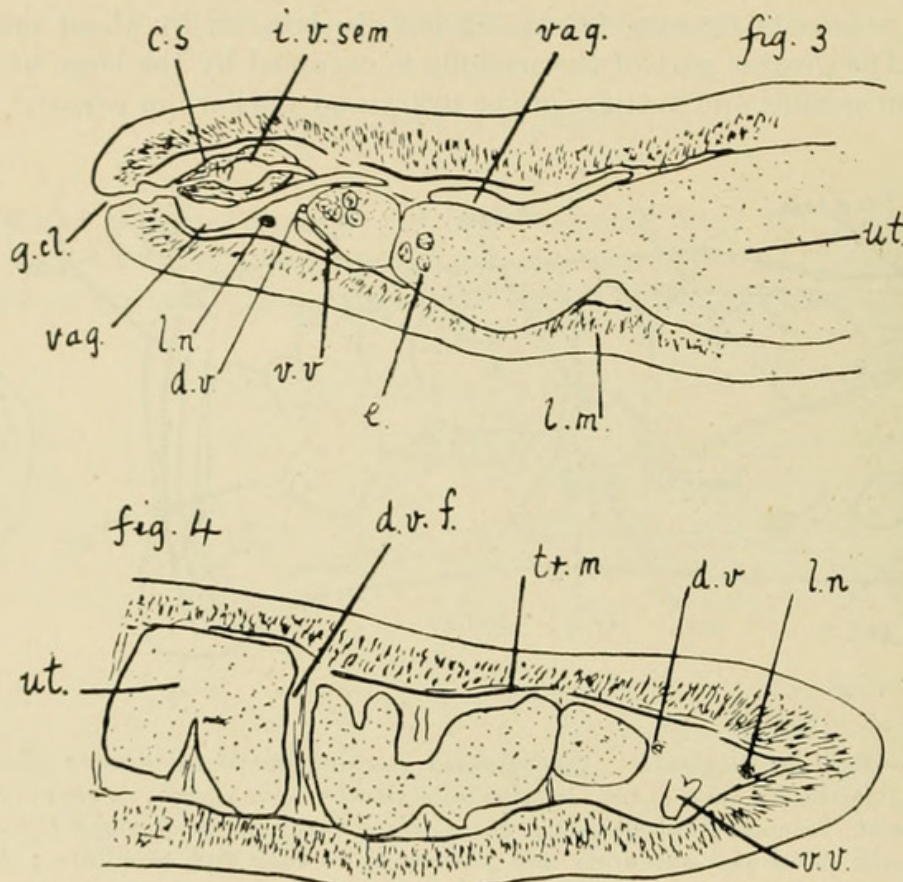


Fig. 3.—Pore-bearing edge of segment in transverse section.

Fig. 4.—The opposite edge in transverse section. *c.s.*, cirrus sac; *d.v.*, dorsal vessel; *d.v.f.*, dorsoventral muscle fibres; *e.*, eggs; *g.cl.*, genital cloaca; *i.v.sem.*, internal vesicula seminalis; *l.m.*, longitudinal muscle fibres; *l.n.*, longitudinal nerve; *tr. m.*, transverse muscle fibres; *ut.*, uterus; *vag.*, vagina; *v.v.*, ventral vessel.

The excretory system of each side consists of a large thin-walled ventral canal lying close to the transverse musculature, and of a very narrow dorsal vessel, difficult to recognise in sections, situated adjacent to the outer edge of the mature uterus.* The transverse canals are wide. The main longitudinal nerve is relatively large. The sex canals pass outwards above it and both excretory vessels.

The only parts of the male apparatus present in my specimens are the ducts. The vas deferens lies anteriorly and, just before crossing the excretory canals, becomes widened to form an "outer" vesicula seminalis (which may be slightly twisted), but again narrows before entering the cirrus sac within which it is again swollen to constitute an "inner" vesicula, terminating in a tubular cirrus. The rather small pyriform sac measures .15 mm. in length and does not extend inwardly as far as the ventral vessel.

Parts of the ovarian tubes are to be found lying behind the uterus on each side of the prominent receptaculum. The vitellarium is also recognisable as a branching gland situated in the median line on the aporal side of, and close to, the receptaculum, its duct passing forwards beside the latter to enter the fertilising duct. Fuhrmann has published a figure showing the relationships of the various structures belonging to the female complex. The thin-walled vagina leads inwards from the rather wide female pore, generally passing dorsally to the cirrus sac. In fig. 3, a section is drawn in which its position is ventral. Fuhrmann has given an illustration of the more usual course. The female duct soon widens as it passes above (or occasionally below) the sac, narrowing again in the vicinity of the excretory canal where it lies quite dorsally, maintaining this position as it travels inwards and posteriorly close to the dorsal transverse musculature and above the mature uterus, eventually opening into the large rounded receptaculum. The latter has a diameter of about .25 mm. and lies in the posterior part of the segment near the median line, but is displaced towards the pore-bearing edge. A narrow tube connects it with the fertilising duct.

The uterus does not remain as a simple transverse tube but becomes widened, its cavity being more or less divided up into a series of closely arranged pouches developed as diverticula anteriorly and posteriorly. The ripe organ fills practically the whole of the medulla and extends outwards towards the excretory canals, its postero-lateral extensions often overlapping the ventral vessel.

Ripe eggs possess two shells, the approximate measurements of the diameters being 55 and 40 micra respectively. The oncosphere is about 27 by 18 micra in size.

ASCARIDIA COLUMBÆ (Gmelin).

The above-mentioned nematode is more commonly known as *Heterakis maculosa* Rud., under which name I have recorded its presence in New South Wales.¹⁰ *Ascaris* sp. of Krefft¹¹ is a synonym.

The parasite was found in several Brisbane pigeons, occurring in some of them in considerable number, many of the worms reaching a large size. The maximum

¹⁰ Johnston, Notes & Exhibits, P.L.S. N.S.W., 34, 1909, p. 412; Johnston, On Australian Avian Entozoa, P.R.S. N.S.W., 44, 1910, p. 121; and Rep. Bur. Microbiol. N.S.W., 2, 1911 (1912), p. 135.

¹¹ Krefft, On Australian Entozoa, &c., Trans. Ent. Soc. N.S.W., 2, 1871, p. 212.

length of the males was 40 mm., and of the females 55 mm. Schneider¹² gives the lengths as 16 and 20 mm. respectively; Railliet¹³ as 16 to 26 mm. and 20 to 34 mm. for each; Neumann¹⁴ as 16 to 30 and 20 to 40 or even 70 mm. respectively; while Travassos¹⁵ gives the same dimensions as Railliet. The account and figure given by Travassos differ somewhat from those of earlier parasitologists, particularly in regard to the number and disposition of the male papillæ.

On account of the discrepancies I have deemed it advisable to give a few figures. Most of my mature specimens are much longer than the average mentioned by the authors quoted. The difference between the sexes is not readily recognised by the naked eye, though mature females not infrequently assume a lancet-like form. The shape of the anterior and posterior ends is shown in the accompanying figures.

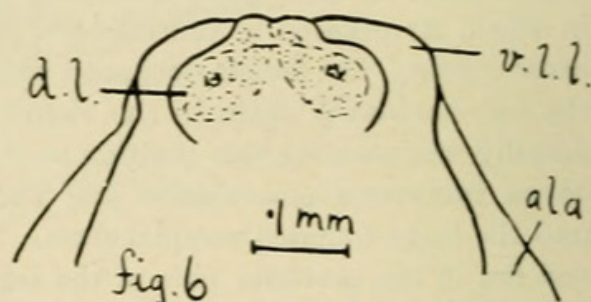
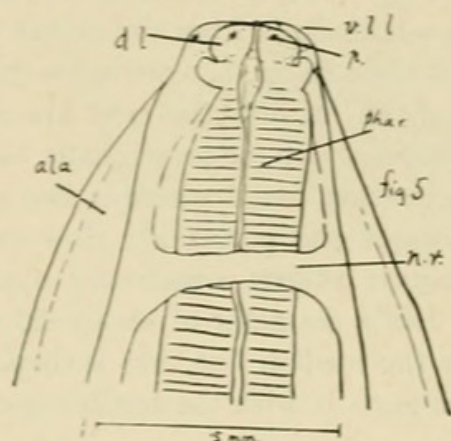


Fig. 5.—*Ascaridia columbæ*. Anterior end—dorsal view. *ala*, ala; *d.l.*, dorsal lip; *n.r.*, nerve ring; *p.*, papilla on dorsal lip; *phar.*, pharynx; *v.l.l.*, ventral lips.

Fig. 6.—Lips, &c.

The three lips are practically equal in size. The dorsal lip is provided with two small papillæ. On the ventral surface of the parasite, just behind the lateral lips, there may be seen a transverse fold of the cuticle. At each side of the anterior end of the worm is a more or less broad though delicate ala of an elliptical outline, extending backwardly for some little distance. The nerve-ring in large specimens lies at about .5 mm. behind the anterior extremity.

The vagina opens at about the midregion of the body. There is a hollowing of the end of the female between the relatively wide anal aperture and the tip of the tail. Eggs measure from .06 to .07 mm. in length by about .04 mm. in breadth.

¹² Schneider, Monographie der Nematoden, 1866, p. 72.

¹³ Railliet, Traité de zoologie médicale et agricole, edit. 2, 1895.

¹⁴ Neumann, Parasites et maladies parasitaires des oiseaux domestiques 1907, p. 146; also in Traité des maladies parasitaires, &c., edit. 2, 1892.

¹⁵ Travassos, Sobre as especies brasileiras da subfamilia Heterakinae, Mem. Inst. Oswaldo Cruz, Rio de Janeiro, 5, 1913 (3), pp. 271-318. Reprint p. 15.

The male spicules are approximately equal in length (1.59 to 1.61 mm.) though one often appears to be rather longer than the other. The sucker is provided with a chitinous ring and measures from .15 to .20 mm. in diameter. On each side of the

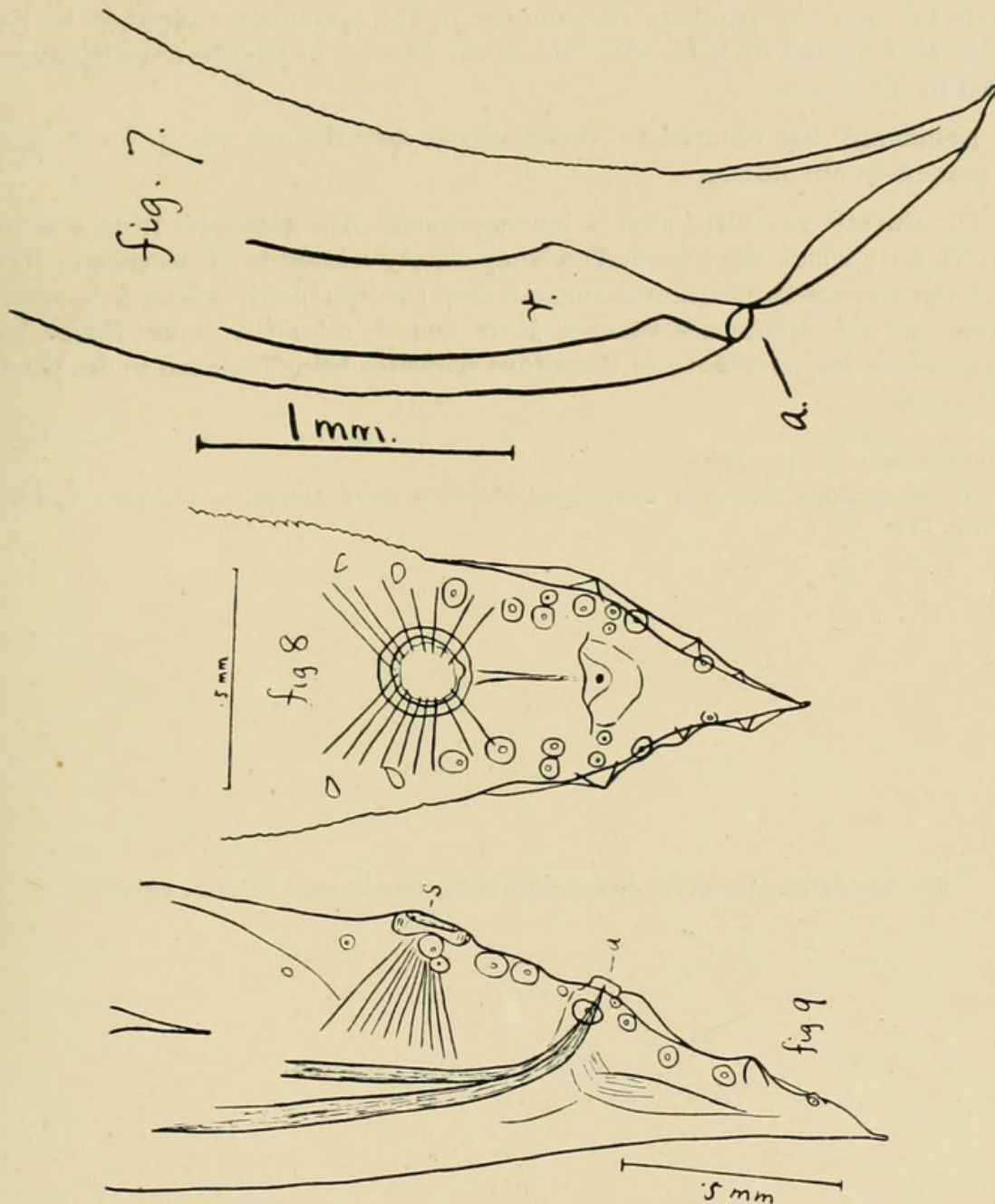


Fig. 7.—Tail of female—side view. *a.*, anus ; *r.*, rectum.

Fig. 8.—Tail of a male—ventral view.

Fig. 9.—Tail of another male—side view. *s.*, sucker.

male tail is a small ala. The arrangement of the papillæ is somewhat variable. The presence of four large ones on each side between the anus and the midregion of the sucker appears to be characteristic. In front of these there are two smaller pairs.

Situated laterally to the anus is a prominent projecting papilla in the vicinity of which are two more. Behind these on each side are four others, the last projecting on the ala and situated close to the mucronate tip of the tail. There are thus thirteen or fourteen pairs but some may not be developed on one or other side. The shape of the male tail and the papillary distribution in the specimens examined by me are more like that figured by Schneider though the number of papillæ approximates that recorded by Travassos.

Neumann¹⁶ has referred to constitutional disturbances set up by *A. columbæ* when present in abundance.

Dr. Sweet¹⁷ in 1910 found a few specimens of a *Heterakis* from a domestic fowl in Victoria which she regarded as being closely related to *H. maculosa*. Though some of the characters mentioned suggest that the specimens belong to a species of *Ascaridia*, yet the differences between them and *A. columbæ*, as mentioned by Dr. Sweet, preclude the possibility of these fowl parasites being included under the latter specific name.

¹⁶ Neumann, *l.c.*, pp. 146-8.

¹⁷ G. Sweet, Some New and Unrecorded Parasites from Australian Chickens, P.R.S. Vict., 23, 1910, p. 246.



Johnston, T. Harvey. 1918. "The endoparasites of the domestic pigeon in Queensland." *Memoirs of the Queensland Museum* 6, 168–174.

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