

ON THE LIFE CYCLE OF THE FOWL CESTODE,
DAVAINEA CESTICILLUS (MOLIN)*

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(Preliminary Communication)

Little is known of the means by which tapeworms are transmitted to fowls. Of the six species recorded from chickens in the United States, the life histories of but two have been demonstrated experimentally. *Davainea proglottina* (Davaine), rare in this country, may be transmitted by the slug, *Limax cinereus* Lister, according to Grassi and Rovelli (1889:372; 1892:86), and *Choanotaenia infundibuliformis* (Goeze) may have the house fly, *Musca domestica* Linn., (Gutberlet, 1916:235) as its intermediate host.

Recently, the writer has demonstrated experimentally that *Musca domestica* may transmit to chickens another tapeworm which appears to be *Davainea cesticillus* (Molin 1858) Blanchard 1891. The fowls used in the experiment were hatched in an incubator and placed at once in a fly-proof field cage which, with its floor and 18-inch walls of cement, is so constructed as to be worm-proof also. Examinations of control chickens every few weeks for four years have not yielded a single parasitic worm. In this field cage, the fowls were given food free from animal tissues, with the exception of some fresh beef and the experimental feedings.

House flies taken from nature were placed in small lantern globe cages and given living onchospheres from the fowl cestode, *D. cesticillus*. Onchospheres and portions of teased, gravid proglottids in a small drop of water were eagerly taken by the flies. The latter were then kept alive as long as possible to afford time for the development of larval tapeworms (cysticercoids) in the bodies of the flies. By giving to these caged flies small amounts of whole, sweet milk, fairly large numbers of them were kept alive for two or three weeks after feeding the onchospheres. As soon as the flies died, they were either preserved for sectioning or given to young chickens reared in the fly-proof field cage. In this way several hundred house flies were fed, a few at a time, to twelve chickens.

From these fowls, nine cestodes were taken, two from chick No. 165 being sexually mature. Control chickens from the same broods kept with the experimental ones in no case yielded a parasitic worm.

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Chick No. 165 was given a total of 245 house flies from August 25 to September 11, and on October 13 the examination revealed two cestodes in the small intestine both of which possessed gravid proglottids. They are described in the following.

DIAGNOSIS

Length, 79 to 90 mm. Maximum width, 1.6 to 2.3 mm. Scolex (Fig. 1) cylindrical, 0.5 to 0.6 mm. wide and 0.3 to 0.4 mm. long. Suckers unarmed, about 0.1 mm. in diameter. Rostellum broad and hemispherical, 0.29 mm. wide, with approximately 200 very unstable hooks. Hooks (Fig. 2), 8 to 9μ long, with long ventral and short dorsal root. Neck very short, followed by proglottids equal to or greater in width than the scolex. Anterior proglottids, 3 to 6 times as broad as long; following ones increasing in size until length exceeds width; borders (Fig. 3) overlapping. Genital pores irregularly alternate, one in each proglottid somewhat in front of middle of lateral margin in young proglottids and nearer middle in older ones. Vagina and cirrus pouch (*c*) on dorsal side of two excretory canals and nerve.

Male reproductive organs: Testes (*t*), 20 in number in posterior portion of proglottid. Vas deferens (*v d*) coiled before entering base of cirrus pouch, also coiled within latter. Cirrus pouch ellipsoidal, 139 to 164μ long by 65 to 82μ wide. Cirrus when protracted, 131μ long and 13μ in diameter, armed with minute spines, and with bulbous enlargement 21μ in diameter at base becoming continuous with cirrus pouch.

Female reproductive organs: Vagina enlarged near median line into small seminal receptacle. Ovary (*o*) in middle field in front of testes. Yolk gland and shell gland posterior to ovary, ventral and dorsal, respectively. Uterus at first in front of ovary; gradually increasing in size, finally extending laterally to excretory canals and occupying most of proglottid; in oldest proglottids dividing into compartments or capsules each containing a single egg. Embryo (Fig. 4), 35 by 31μ in diameter, with very thin membrane closely adherent to its surface; embryo further enveloped by thicker, smooth membrane, oval in shape, 42 by 36μ in diameter; latter surrounded by thin, wrinkled membrane approximately 66 by 61μ in diameter; embryo and membranes finally enclosed in capsule of outer and inner layer.

The characteristic scolex with its broad, flat rostellum, the anterior proglottids as wide as the scolex, and the eggs in individual capsules in the posterior proglottids, together with the other diagnostic points

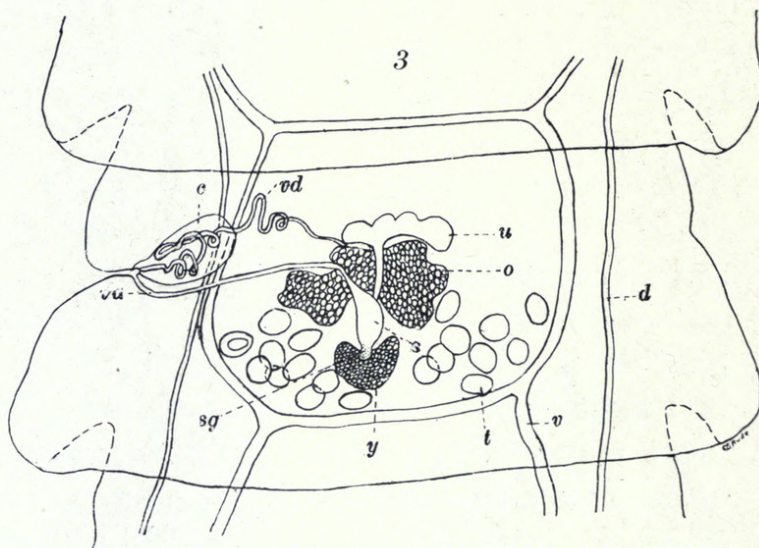
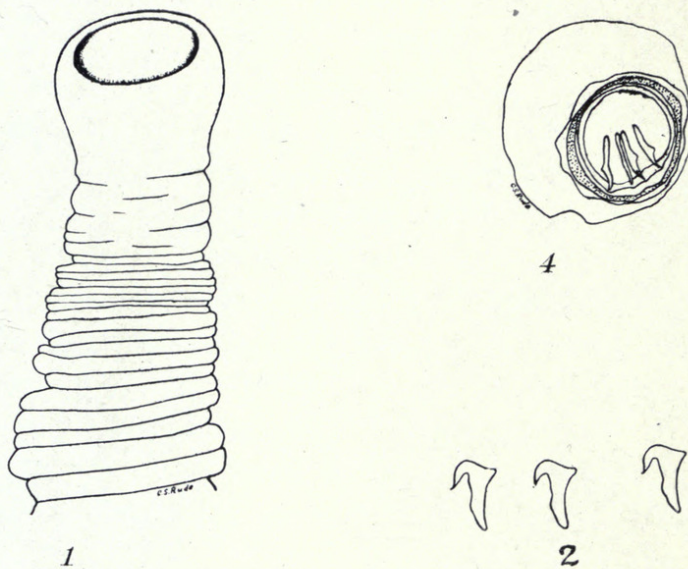


PLATE V

appear to leave no doubt as to the identity of these worms. As the house flies constituted the only animal tissues (except fresh beef) given to the experimental chickens, the writer concludes that *Musca domestica* may transmit *Davainea cesticillus* to fowls.

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EXPLANATION OF PLATE

- Fig. 1.—Scolex showing broad, flat rostellum and anterior proglottids. $\times 62$.
 Fig. 2.—Rostellar hooks. $\times 480$.
 Fig. 3.—Mature proglottid. Certain details were added from studies of transverse sections. $\times 103$.
 Fig. 4.—Embryo. $\times 668$.

The drawings were made with the aid of a camera lucida.

ABBREVIATIONS

<i>c</i> , cirrus pouch	<i>d</i> , dorsal excretory canal
<i>o</i> , ovary	<i>s g</i> , shell gland
<i>s</i> , seminal receptacle	<i>t</i> , testes
<i>u</i> , uterus	<i>va</i> , vagina
<i>v d</i> , vas deferens	<i>v</i> , ventral excretory canal
	<i>y</i> , yolk gland



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