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Binder 042, Dicrocoelidae A [Trematoda Taxon Notebooks]

Harold W. Manter Laboratory of Parasitology

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субтерминальная, 0,32—0,50 мм в диаметре. Соотношение размеров присосок 1,01—1 : 1,18. За ротовой присоской следует фаринкс около 0,10—0,22 мм в диаметре. Пищевод сравнительно длинный, около 0,10—0,60 мм длины. Кишечные стволы очень широкие, относительно короткие; их окончания отстоят на расстоянии 0,4—1,9 мм от хвостового конца и обычно лежат на разных уровнях. Половые отверстия располагаются сублатерально, в зоне бифуркации кишечника. Крупная половая бурса лежит поперек кишечного ствола и наискось к продольной оси тела, обычно достигая области брюшной присоски и проникая дорзально от нее; она достигает 0,36—0,64 × 0,07—0,15 мм, содержит циррус, простатическую часть и мешковидный семенной пузырек. Vasa efferentia соединяются в точке проникновения в половую бурсу. Семенники круглые или удлинённые, часто слегка лопастные, расположены частично в зоне брюшной присоски, с раздвинутыми полями; иногда они частично налегают на область кишечных стволов. Размеры их 0,26 × 0,18 мм и 0,78 × 0,70 мм. Яичник лежит позади семенников, но большей своей частью или целиком в их зоне, частично дорзально от брюшной присоски; он круглой или слегка удлинённой формы, 0,22 × 0,19—0,41 мм. Обычно он почти соприкасается с семенником, лежащим на противоположной от полового отверстия стороне. Тельце Меллиса лежит медианно, в области яичника, имеет малоотчетливые очертания и достигает около 0,16 мм в диаметре. Лауреров канал открывается дорзально, позади яичника. Семяприемник отсутствует; сперматозоиды скопляются в начальной части матки. Желточники лежат латерально, в экстрацекальной области, с единичными фолликулами, проникающими в цекальную зону. Они состоят из многочисленных мелких фолликулов, начинаясь непосредственно позади бифуркации или даже на ее уровне, идут до середины кишечных стволов, достигая в длину 0,8—2 мм и оканчиваясь на расстоянии около 1—3 мм от заднего конца тела. У одного экземпляра желточники лежали на одной стороне тела, достигали в длину 1,4 мм и отстояли на 0,7 мм от заднего конца тела. Матка широкая, образует поперечные петли в интрацекальной и цекальной областях, причем некоторые петли проникают в экстрацекальную область и заходят назад дальше кишечных стволов. Терминальная часть матки проникает между яичником и семенником, со стороны полового отверстия, после чего, образуя небольшие извивы, заканчивается метратермом, расположенным параллельно половой бурсе. Женское половое отверстие лежит впереди мужского. Яйца мелкие с тонкой оболочкой, снабжены крышечками, светложелтого цвета, их размер 0,030—0,034 × 0,015—0,017 мм. Экскреторное отверстие терминально. Экскреторный пузырь простой; у молодых экземпляров снабжен двумя толстыми ветвями, вероятно, являющимися сильно расширенными главными собирательными каналами.

Паразит, описанный Руис и Лео под именем *I. intermedium*, соответствует, по мнению Травассоса (1944), настоящему виду.

Л и т е р а т у р а: Travassos, 1916, стр. 258; Ruiz e Leao, 1943, стр. 203; Travassos, 1944, стр. 283—285.

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А л е й н и к о в а М. М. и М е н д е л е в и ч М. М., 1938. К изучению дикроцелиоза зайцев Татарской и пограничных республик. Уч. зап. Казанск. гос. зоовет. ин-та, т. 49, в. 2, стр. 134—141.

- Бадагин Н. В., 1935. Опыт качественного и количественного учета паразитических червей верблюда, обследованного методом полных гельминтологических вскрытий. Тр. Туркменск. с.-х. ин-та, т. 1, вып. 1, стр. 5—14.
- Верещагин М. Н., 1926. К фауне паразитических червей коз Туркестана. Тр. Гос. ин-та экспер. ветер., т. 2, вып. 2, стр. 3—15.
- Всеголов Б. П., 1937. Патолого-анатомические изменения поджелудочной железы при зуритрематозе. Работы по гельминтологии. Сб., посв. проф. К. И. Скрыбину. Изд. ВАСХНИЛ, Москва, стр. 758—762.
- Всеголов Б. П., 1950. Очерки по патоморфологии паразитарных заболеваний каменной куропатки — кеклика *Alectoris graeca*. Изв. АН. Каз. ССР, сер. паразитол. 8, стр. 246—254.
- Габиев А. Д., 1937. К изучению фауны паразитических червей лошадей Азербайджана. Сб., посвящ. проф. К. И. Скрыбину, стр. 178—179.
- Гушанская Л. Х., 1952. К гельминтофауне диких куриных птиц СССР. Тр. гельминтол. лаборатории АН СССР, т. VI, стр. 175—222.
- Демидова А. И., 1935. Die Helminthenfauna der Hunde in Azerbaidshan. Arch. f. Schiffs- u. Tropenhyg. Bd. 39, H. 10 SS. 412—416.
- Иваницкий С. В., 1927. К фауне трематод позвоночных Украины. Ветерин. Дело, № 5 (42).
- Исайчиков И. М., 1919. Новые представители трематод рода *Lyperosomum*. Изв. Донск. вет. ин-та, т. 1, вып. 1, стр. 1—11.
- Исайчиков И. М., 1920. Новый представитель рода *Eurytrema* Looss. Изв. Донск. вет. ин-та, т. 1, вып. II, стр. 1—11.
- Исайчиков И. М., 1929. Новая трематода рода *Plagiorhis* (Lühe, 1899) из куликов. Тр. Сиб. вет. ин-та, вып. 10.
- Калантарян Е. В., 1924. К фауне паразитических червей грызунов Армении. Тр. Троп. ин-та Армении, т. I, стр. 18—31.
- Касимов Г. Б., 1948. Новый вид трематод у кавказской горной индейки в Азербайджане—*Corrigia skrjabini* n. sp. Докл. АН Азерб. ССР, т. IV, № 4, стр. 174—177.
- Касимов Г. Б., 1952. *Skrjabinus popovi* n. sp.—новая трематода от кавказской горной индейки. Тр. Гельминтол. лаборатории АН СССР, т. VI, стр. 232—234.
- Клейнбок М. Т., 1949. Патоморфология поджелудочной железы при зуритрематозе у домашних животных. Тр. Алма-Атинского ветеринарно-зоотехнического ин-та, том VI, стр. 341—355.
- Линистов О., 1885. Путешествие А. П. Федченко. Паразитические черви. Круглые, сосальщики и колючеголовые. Изв. Об-ва любит. естествозн., антропол. и этногр., т. 34, вып. II.
- Ляйман Э. М., 1922. Zur Charakteristik neuer *Lyperosomum* Arten. Zentralbl. Bakt., Parasit. u. Infekt. Bd. 56, H. 23/24, SS. 568—572.
- Ляйман Э. М., 1923. *Lyporesomum fringillae* n. sp. новый паразит печени птиц.—Архив научн. и практ. ветер., т. I, вып. 1.
- Ляйман Э. М., 1926. Трематоде желчных ходов печени птиц России. Работы паразитол. лабор. 1 МГУ под редакц. К. И. Скрыбина, стр. 59—72. Москва.
- Олигер И. М., 1950. Паразитофауна тетеревиных птиц лесной зоны европейской части РСФСР. Автореферат канд. дисс.
- Ошмарин П. Г., 1947. Описание двух новых видов трематод из печени птиц, в связи с анализом их филогенетических отношений. Тр. Горьковск. гос. пед. ин-та, т. XII, стр. 33—47.
- Панова Л. Г., 1927. Гельминтология в Казахстане. Сб. работ по гельминтологии. посвящ. проф. К. И. Скрыбину, стр. 121—137.
- Петров А. М., 1930. К фауне паразитических червей домашних плотоядных Северо-Двинской губернии. Работы 32-й и 38-й Союзных гельминтологических экспедиций, стр. 57—67. Вятка.
- Петров А. М. и Шаховцева Е. С., 1926. К фауне паразитических червей овец Туркестана. (По матер. 5-й СГЭ). Тр. Гос. ин-та экспер. ветер., т. 4, вып. 1, стр. 78—88.
- Петров А. М. и Скворцов А. А., 1928. Работа сорок первой Союзной гельминтологической экспедиции в Нижегородской губернии 25/V—1/VIII—1927 г. Н. Новгород. Отд. отг. из 9-го вып. «Производительные силы Нижегородской губернии», стр. 83—123.
- Подъяпольская В. П., 1927. К характеристике качественного разнообразия гельминтозов человека в СССР. Сб. работ по гельминтологии, посвящ. проф. К. И. Скрыбину, стр. 156—176.
- Потехина Л. Ф., 1948. Новая трематода птиц *Brachylecithum platynosomoides*. Тр. Гельминтол. лаборатории АН СССР, т. 1, стр. 156—157.

- Пухов В. И., Кривошта Е. Е. и Величкин П. А., 1937. К биологии *Dicrocoelium lanceatum*. Сб. работ по гельминтологии, посвящ. проф. К. И. Скрябину, стр. 547—549.
- Раевская З. А. и Баданин Н. В., 1933. Глистные инвазии верблюдов и борьба с ними. Сельхозгиз, Москва.
- Семенов В. Д., 1927. Трематоды птиц Западного края СССР. Сб. работ по гельминтологии, посвящен. проф. К. И. Скрябину, стр. 221—271.
- Скворцов А. А., 1934. Исследование по циклу развития *Dicrocoelium lanceatum*. Медицинск. паразитол. и паразит. болезни, т. 3, стр. 240—253.
- Скворцов А. А., 1936. Биология возбудителя дикроцелиоза домашних животных. Доклады ВАСХНИЛ, вып. 1, стр. 35—40.
- Скрябин К. И., 1911. Обнаружение *Dicrocoelium lanceatum* в печени лошади. Вестн. общ. ветеринарии. № 13, стр. 701.
- Скрябин К. И., 1911. К вопросу о зависимости патолого-анатомической картины поражения печени при дистоматозе от вида паразита. Уч. зап. Казанского вет. ин-та, т. 28, вып. 2, стр. 225—227.
- Скрябин К. И., 1913. Vogel-Trematoden aus Russisch Turkestan, Zool. Jahrb. Abt. Syst., Bd. 35. H. 3, S. 351.
- Скрябин К. И., 1913. *Lyperosomum filiforme* n. sp. Материалы к систематике рода *Lyperosomum* Looss, 1899. Журн. научн. и практ. вет. мед., т. VII, в. 2, стр. 274—292.
- Скрябин К. И., 1916. Трематоды и паразитические нематоды. Научные результаты зоологической экспедиции проф. В. А. Догеля и И. И. Соколова в Британскую Восточную Африку и Уганду. Петроград, т. 1.
- Скрябин К. И., 1920. Гельминтологические заметки. Изв. Донск. вет. ин-та, т. 2, вып. 2.
- Скрябин К. И., 1920. Трематоды парагвайских змей. Изв. Донск. вет. ин-та, т. 1, в. 2, стр. 6—11.
- Скрябин К. И., 1923. Глистные инвазии овец в свете современных представлений. Шерст. дело, № 10/12, стр. 100—109.
- Скрябин К. И., 1924. Паразитические черви свиней и их патогенное значение. — Тр. Сиб. вет. ин-та, в. VI, стр. 133—134. Омск.
- Скрябин К. И., 1931. Глистные инвазии овец и их значение в экономике овцеводческого хозяйства. Изд. 2-е, М.—Л.
- Скрябин К. И., 1932. La prophylaxie par le traitement des helminthoses du mouton d'après la pratique de l'Union Soviétique. Bull. Off. Intern. des Epizoot., т. 6, № 1, pp. 155—171.
- Скрябин К. И., 1944. Анализ родовых компонентов, входящих в состав трех семейств трематод: *Opisthorchiidae*, *Dicrocoeliidae* и *Echinostomatiidae*. Доклады Акад. Наук СССР, т. 44, № 7, стр. 328—330.
- Скрябин К. И. и Массино Б. Г., 1925. Trematoden bei den Vögeln des Moskauer Gouvernement. Zentralbl. Bakt., Abt. 2, Bd. 64, H. 5. SS. 453—462.
- Скрябин К. И. и Исаячков И. М., 1927. Four new species of the family *Dicrocoeliidae* from the liver of birds. Ann. Trop. Med. a. Parasit., v. 21, № 3, pp. 303—308.
- Скрябин К. И. и Шульц Р. С., 1928. К анализу гельминтофауны населения Средней Азии. Раб. 35-й гельминт. экспед. в Ср. Азию, организ. Дорздравотд. Ср.-Аз. ж. д. Москва.
- Скрябин К. И. и Удинцев А. М., 1930. Two new trematodes from biliary ducts of birds from Armenia. Journ. Parasitol., v. 16, № 4, pp. 213—219.
- Скрябин К. И., Шульц Р. С., Метелкин А. И. и Попов П. П., 1934. Ветеринарная паразитология и инвазионные болезни домашних животных. 600 стр., М.—Л.
- Скрябин К. И. и Шульц Р. С., 1937. Гельминтозы крупного рогатого скота и его молодняка. Сельхозгиз.
- Соловьев П. Ф., 1911. Новый вид рода *Dicrocoelium* Difardin, 1845 и экскурсия в область систематики и филогении *Fasciolidae* птиц. Работы Зоол. лабор. Варшавского ун-та.
- Судариков В. Е. и Рыжиков К. М., 1951. К гельминтофауне копытных Прибайкалья. Тр. Гельминтол. лаборатории АН СССР, т. V, стр. 53—58.
- Тарасов В., 1932. О дифференциальном диагнозе действительного и ложного дикроцелиоза. Мед. паразитол. и паразит. болезни, т. 1, стр. 50—52.
- Штром Ж. К., 1927. О ложных дистоматозах печени. — Вестн. микробиол. и эпидемиол., т. 6, вып. 4, стр. 433—438.
- Штром Ж. К., 1928. Eine neue Art der Vogeltrematoden — *Oswaldoia pawlowskyi* n. sp. Zool. Anz., Bd. 77, H. 7/8, SS. 184—189.

- Штром Ж. К., 1935. К фауне трематод Таджикистана. Материалы по паразитологии и фауне Южного Таджикистана. Тр. Экспедиции, в. X. Изв. АН СССР, М.—Л.
- Штром Ж. К., 1940. К фауне трематод диких животных Киргизии. Паразитол. сб. Зоол. ин-та АН СССР, т. VIII.
- Штром Ж. К., 1940. Заметки по систематике *Dicrocoeliinae* (Trematoda). Паразитол. сб. Зоол. ин-та АН СССР, т. VIII.
- Штром Ж. К. и Сондак В. А., 1935. Новые и малоизвестные трематоды сем. *Plagiorchidae* и *Dicrocoeliidae* (по материалам Талышской экспедиции 1934 г.). Паразиты, переносчики и ядовитые животные. Сб. работ, посвящ. 25-летию научн. деят. проф. Е. Н. Павловского. Изд. ВИЭМ, М.—Л.
- Шульц Р. С., 1931. Паразитические черви кроликов и зайцев и вызываемые ими заболевания. 238 стр. Сельхозгиз, Москва.
- Щербачова Е. Я., 1942. К изучению гельминтофауны грызунов Армении. Изв. Арм. фил. АН СССР, т. 1—2, стр. 159—173.
- Щерболич И. А., 1946. Трематоды птиц Дальнего Востока. Гельминтологический сборник, посвящ. академику К. И. Скрябину, стр. 296—300.
- Adam W. et Leloup, 1934. Recherches sur les parasites des mollusques terrestres de Belgique. Trématodes larvaires. Mém. Musée d'Hist. nat. de Belgique, Nr. 62, pp. 1—40.
- Almarza N., 1935. Die Leberegel des Schafes. Zeitschr. Infektionsk. d. Haustiere, Bd. 37, SS. 197—202.
- André E., 1915. *Mesocoelium carli* n. sp. Trématode parasite d'une tortue africaine. Revue Suisse de Zool., t. 23, pp. 91—93.
- Anglas J. et de Ribaucourt E., 1902. Etude anatomique et histologique de *Distomum lanceolatum*. Ann. Sciences nat. 8 sér. Zool. et Paléont., t. 13, pp. 313—354.
- Aschoff L., 1892. Ein Fall von *Distomum lanceolatum* in der menschlichen Leber.— Arch. pathol. Anat. u. Physiol. f. klin. Med., Bd. 130, SS. 453—496.
- Baer J. G., 1931. Etude monographique du groupe des Temnocéphales. Bull. biol. de France et de Belgique, t. 65 (1), pp. 1—57.
- Baer J. G., 1932. Contribution à la faune helminthologique de Suisse. Revue Suisse de Zool., t. 39, pp. 1—56.
- Baldi C., 1900. *Distoma lanceolata* nel fegato di cavallo.— Clin. veterin. Milano, t. 23, p. 222.
- Balrall B., 1940. Studi sulla distomatosi. Nota prima. Ricerche ematologiche e biochimiche in bovine normali ed affetti da distomatosi epatica.— Nueva veterinaria, t. 18, f. 6, pp. 134—142.
- Balrall B., 1940. Studi sulla distomatosi. Note seconda. Ricerche ematologiche e biochimiche in ovine normali ed affetti da distomatosi epatica.— Nueva veterinaria, t. 18.
- Baylis H. A., 1918. Is *Dicrocoelium lanceatum* a parasite of the cat? A note of new variety.— Ann. a. Mag. Nat. Hist., ser. 9, vol. 2, pp. 111—114.
- Baylis H. A., 1927. Note on three little known trematodes.— Ann. a. Mag. Nat. Hist., ser. 9, vol. 10, pp. 426—443.
- Baylis H. A., 1928. Records of some parasitic worms of British vertebrates. Ann. a. Mag. Nat. Hist., ser. 10, vol. 1, pp. 329—343.
- Berghe L. v. d. et Deneckee K., 1938. *Dicrocoelium dendriticum* (*Fasciola lanceolata*) chez l'homme et les singes au Congo Belge.— Ann. Soc. belge Méd. tropicale, t. 18, Nr. 3, pp. 509—514.
- Bhalerao G. D., 1924. A contribution to the knowledge of the trematode parasites of the food mammals of Rangoon. Ann. Tropic. med. a. parasitol., vol. 18, pp. 139—156.
- Bhalerao G. D., 1926. The intestinal parasites of the bat (*Nyctinomus plicatus*) with a list of the trematodes hitherto recorded from Burma. Journ. of the Burma Res. Soc., vol. 15, Nr. 3, pp. 181—195.
- Bhalerao G. D., 1926. The trematodes of *Corvus insolens* (a Burmese house crow) with a description of four new species. Parasitology, vol. 18, pp. 387—398.
- Bhalerao G. D., 1927. A new species of trematode from *Mabuia dissimilis*. Ann. a. Mag. Nat. Hist., ser. 9, vol. 10, pp. 611—615.
- Bhalerao G. D., 1929. The genus *Paradistomum* in Burmese reptiles. Ann. a. Mag. Nat. Hist., ser. 10, vol. 3, pp. 412—421.
- Bhalerao G. D., 1933. The most practical methods of combating parasitic gastritis and fluke infestation of ruminants under field conditions in India. Agriculture and Livestock in India, vol. 3, Nr. 4, pp. 354—360.

- Bhalerao G. D., 1934. The common worms of cattle in India and their control. Agriculture and Livestock in India, vol. 4, Nr. 1, pp. 3—15.
- Bhalerao G. D., 1934. The common worms of sheep and goats in India and their control. Agriculture and Livestock in India, vol. 4, Nr. 4, pp. 655—669.
- Bhalerao G. D., 1936. Studies on the helminths of India. Trematoda I. Journ. Helminth., vol. 14, pp. 163—180.
- Blainville, 1928. In «Dictionnaire des sciences naturelles», t. 57.
- Boyd E. M., 1951. A survey of parasitism of the starling *Sturnus vulgaris* L. in North America. Journ. Parasitol. vol. 37, N 1, pp. 56—84.
- Braun M., 1893. Trematodes. Bronn's Tierreich, Abt. J, SS. 306—925.
- Braun M., 1899. Ein neues Distomum aus Porphyrio. Zool. Anz., Bd. 22, SS. 1—4.
- Braun M., 1899. Trematoden der Dahl'schen Sammlung aus Neu-Guinea nebst Bemerkungen über endoparasitische Trematoden der Cheloniden. Zentralbl. f. Bakt. Orig., Bd. 25, S. 714.
- Braun M., 1901. Zur Revision der Trematoden der Vögel. I. Zentralbl. f. Bakt. Orig., Bd. 29, SS. 560—568.
- Braun M., 1901. Zur Revision der Trematoden der Vögel. II. Zentralbl. f. Bakt. Orig., Bd. 29, SS. 941—948.
- Braun M., 1901. Ein neuer *Dicrocoelium* aus der Gallenblase der Zibethkatze. Zentralbl. f. Bakt. Orig., Bd. 30, SS. 700—702.
- Braun M., 1902. Fascioliden der Vögel. Zool. Jahrb. Syst., Bd. 16, SS. 1—162.
- Brown F. J., 1933. On the excretory system and life history of *Lecithodendrium chilostomum* (Mohl.) and other bat trematodes, with a note on the life history of *Dicrocoelium dendriticum* (Rudolphi). Parasitology, vol. 25, pp. 317—328.
- Burggraaf A., 1933. Bydrage tot de kennis der Pancreasdistomatose by het rund verorzaak door *Eurytrema pancreaticum* (Janson, 1889) Looss, 1907. Tydschr. voor Diergeneeskunde, vol. 60, pp. 1277—1282.
- Caballero E. y Sokoloff D., 1936. Quinta contribucion al conocimiento de la parasitologia de la *Rana montezumae*. Resumen: Clave de las especies del Genero *Cephalogonimus* y descripcion de una nueva especie (Trematoda). Anales Inst. Biologia., Mexico, t. 7, Nr. 1, pp. 119—159.
- Clot J., 1946. Matériaux pour servir à la faunehelminthologique de France. Ann. Parasit. hum. et comp., t. 21, pp. 199—201.
- Cameron T. W. M., 1924. The pig and human disease. Proc. R. Soc. of Med., vol. 17, pp. 31—36.
- Cameron T. W. M., 1928. On some parasites of the rusty tiger cat. Journ. of Helminth., vol. 6, pp. 87—98.
- Cameron T. W. M., 1931. Experimental infection of sheep with *Dicrocoelium dendriticum*. Journ. Helminth., vol. 9, pp. 41—44.
- Cameron T. W. M., 1934. Common parasites of sheep. Journ. of Agric. a. Horticult.
- Cameron T. W. M., 1934. The internal parasites of domestic animals. A manual for veterinary surgeons. 292 pp.
- Canavan W. P. N., 1937. Two new species of trematodes a Renifer, *Lechriarchis secundus* n. sp. from *Natrix s. sipedon*, and a Dicrocoelid, *Dicrocoelium proxilliens* sp. n. from *Kakatoe sulphurea*. Journ. of Parasitol., vol. 23, pp. 478—481.
- Chandler A. C., 1923. Three new trematodes from *Amphiuma means*. Proc. U. S. Nat. Mus., vol. 63, Art. 3, pp. 1—7.
- Chandler A. C., 1942. The helminths of raccoons in East Texas. Journ. of Parasitol., vol. 23, Nr. 4, pp. 255—268.
- Chatterji R. C., 1938. Annotated list of the helminths recorded from domesticated animals of Burma. Part. I. Trematoda. Proc. Nat. Acad. Sci. India, vol. 8, pp. 93—104.
- Cianciotta A., 1933. Reperti parassitologici negli ovini pugliesi. Pathologica, t. 26, pp. 213—214.
- Cobbold T. S. 1860. Synopsis of the Distomidae. Proc. Linn. Soc. London., vol. 5, pp. 1—56.
- Cobbold T. S. 1879. Parasites: a treatise on the Entozoa of man and animals. I vol. London.
- Cohn L. 1903. Zur Kenntnis einiger Trematoden. Zentrabl. f. Bakt. Orig. Bd. 34, SS. 35—42.
- Conklin R. L. and Baker A. D., 1903. Presence of the lancet fluke *Dicrocoelium dendriticum* (Rudolphi, 1819) in Canada. Journ. of Parasitol., vol. 17, pp. 18—19.
- Denton J. F., 1940. A revision of the subfamily *Dicrocoeliinae* Looss, 1899, with new species from North American birds. Journ. of Parasitol., vol. 26, suppl. 6, p. 34.

- Denton J. F., 1942. *Eurytrema procyonis* n. sp. (Trematoda: *Dicrocoeliidae*) from the raccoon, *Procyon lotor*. Proc. Helminth. Soc. Washinton, vol. 9, Nr. 1, pp. 29—30.
- Denton J. F., 1944. Studies on the life history of *Eurytrema procyonis* Denton, 1942. Journ. Parasit. vol., 30, pp. 277—286.
- Denton J. F., 1945. Studies on the life history of *Brachylecithum americanum* n. sp., a liver fluke of passerine birds. Journ. Parasit. vol. 31, pp. 131—141.
- Diesing K., 1850. Systema helminthum. Vol. I. 680 pp., Wien.
- Diesing K., 1858. Revision der Myzhelminthen. Sitz. k. Akad. d. Wissensch. mathem naturw. Cl. Bd. 32, SS. 307—390.
- Dollfus R., 1922. Variations de la forme du corps, la position et la forme des testicules chez *Dicrocoelium lanceolatum* (Rudolphi). Bull. Soc. Zool. de France, t. 47, pp. 387—404.
- Dollfus R., 1922. Observations sur la morphologie de *Paradistoma mutabile* (Molin) (*Dicrocoelide* nouveau pour la faune de France). Bull. Soc. Zool. de France, t. 47, pp. 387—404.
- Dollfus R., 1923. Addition à la bibliographie des notes sur les *Dicrocoeliinae* et *Paradistoma mutabile* (Molin). Bull. Soc. Zool. de France, t. 58, p. 32.
- Dollfus R., 1925. Distomiens parasites des *Muridae* du genre *Mus*. Ann. Parasit. hum. et comp., t. 3, Nr. 1/2, pp. 85—102, 185—205.
- Dollfus R., 1930. Le point d'aboutissement des canaux collecteurs à la vessie chez les distomes; son importance au point de vue systématique. Ann. Parasit. hum. et comp., t. 8, Nr. 2, pp. 143—146.
- Dollfus R., 1935. Les distomes des *Stylommatophores* terrestres (exclus. *Succineidae*). Catalogue par hôtes et résumé des descriptions. Ann. Parasit. hum. et comp., t. 13, pp. 177—188, 259—278, 369—385, 445—485.
- Dollfus R., 1938. Au sujet d'une cercaire de *Dicrocoeliide*, récemment observée en Bretagne.— Ann. Parasit. hum. et comp., t. 16, Nr. 6, pp. 560—561.
- Dollfus R., Callot J. et Desportes C., 1934. Sur une cercaire du groupe *Vitrina* et sa *Metacercaire* enkystée.— Ann. Parasit. hum. et comp., t. 12, pp. 521—527.
- Dujardin F., 1845. Histoire naturelle des helminthes ou vers intestinaux. I. 654 pp.
- Faria G., 1910. Contribuição para a systematica helminthologica brasileira. II. *Dicrocoelium infidum* n. sp. parasito da vesicula biliar de *Eunectes murina* L.— Mem. Inst. O. Cruz, t. 2, f. 1, pp. 22—28.
- Faria G., 1912. Contribuição para a helminthologia brasileira. V. *Dicrocoelium conspicuum* n. sp. parasito de vesicula biliar de *Mimus lividus* Licht. Mem. Inst. O. Cruz., t. 4, f. 1, pp. 62—64.
- Faust E. C., 1929. Human helminthology.
- Faust E. C., 1932. The excretory system as a method of classification of digenetic trematodes. Quart. Rev. of Biol., vol. 7, pp. 458—468.
- Faust E. C., 1939. Human helminthology. 2nd edit., 780 pp.
- Faust E. C., 1949. Human. Helminthology. Lea a. Febiger, Philadelphia.
- Fernando W., 1932. Contribution to Ceylon helminthology. I. *Paradistomum lanka*, a parasite from the gall-bladder of the unicorn lizzard of Ceylon. Ceylon Journ. Sci. v. 17, pp. 139—146.
- Fernando W., 1933. Contribution to Ceylon helminthology. 3. *Mesocoelium burti* sp. n., *Mesocoelium marssi* sp. nov. and *Haplorchis pearsoni* n. sp. Ceylon Journ. Sci., vol. 18, pp. 9—18.
- Figueiredo C. B., 1928. Sobre as lesões do pancreas de boi produzidas pelo *Eurytrema pancreaticum*. Mem. Inst. O. Cruz, suppl. 3, p. 83.
- Foster A. O., 1939. Some helminths of the wooly opossum in Panama. Trans. Amer. Micr. Soc., vol. 58, Nr. 2, pp. 185—198.
- Freitas J. F. F. e Lent H., 1937. Novo trematodeo parasito de *Strix flamea perlata* (Licht). Mem. Inst. O. Cruz., t. 32, pp. 535—538.
- Fuhrmann O., 1928. Trematoda. Handb. der Zoologie, II. SS. 1—140.
- Gaillard H. et Ngu D., 1941. Une nouvelle espèce d'*Eurytrema*, *E. tonkinense* n. sp. parasite du pancreas des bovidés. Ann. Parasitol., t. 18, pp. 187—191.
- Galli Valerio B., 1935. Observations helminthologiques. Schweiz. Archiv f. Tierheilk., Bd. 77, SS. 420—427.
- Gedoelst L., 1913. Un type nouveau de *Dicrocoelidé* parasite des primates. Bull. Soc. Path. exot., t. 6, pp. 256—259.
- Giard A. et Billet A., 1892. Sur quelques trématodes parasites des boeufs du Tonkin. C. R. Soc. Biol. (N. S.), t. 4, pp. 613—615.

- Gogate B. S. 1939. On a new species of the genus *Euparadistomum* Tubangui (Trematoda) from a cat, *Cerivoula picta* (Pallas) from Burma. Rec. Indian Mus., vol. 41, Nr. 1, pp. 17—19.
- Gogate B. S. 1940. On a new trematode genus *Proacetabulorchis* and a new species of the genus *Procrassiphola* Verma, 1935 from Rangoon. Rec. Indian Museum, vol. 42, pp. 19—23.
- Gohar N., 1935. Liste des trématodes et de leurs hôtes vertébrés, signalés dans la vallée du Nil. Ann. Parasit. hum. et comp., t. 13, Nr. 1, pp. 80—90.
- Goldberger J. and Crane C. G., 1911. A new species of *Athesmia* (*A. foxi*) from a monkey. Hygienic Labor. Bull., Nr. 71, pp. 48—55.
- Goto S. and Ozaki Y., 1929. 10. Brief notes on new Trematodes I. Japanese Journ. Zool., vol. 2, Nr. 2, pp. 213—217.
- Goto S. and Ozaki J. 1930. 3. Brief notes on new trematodes III. Japanese Journ. Zool., vol. 3, Nr. 1, pp. 73—82.
- Harwood P. D., 1932. The helminths parasitic in the amphibia and reptilia of Houston, Texas and vicinity. Proc. U. S. Nat. Mus., vol. 81, Art. 17, 71 pp.
- Hasselman G. E., 1914. Contribuição ao estudo anatomo-pathologico no macro-parasitismo. Tese de livre docencia. Rio de Janeiro, 26 pp.
- Heidegger E. und Mendheim H., 1938. Beiträge zur Kenntnis der Gattung *Platynosomum* I. *Platynosomum fallax* n. sp. ein neuer *Dicrocoeliinae* aus dem Gelbwangenkakadu (*Cecatus sulphurea*). Zeitschr. f. Parasitenk., Bd. 10, H. 1, SS. 94—97.
- Heidegger E. und Mendheim H., 1938. Nachtrag zur Arbeit «Beiträge zur Kenntnis der Gattung *Platynosomum*». Zeitschr. f. Parasitenk., Bd. 10, H. 5, S. 674.
- Heinemann E., 1937. Neue Parasitenfunde beim Elchwild.—Zeitschr. f. Parasitenk., Bd. 9, H. 4, SS. 559—562.
- Henkel H., 1931. Untersuchungen zur Ermittlung des Zwischenwirtes von *Dicrocoelium lanceatum*. Zeitschr. f. Parasitenk., Bd. 3, SS. 664—712.
- Hofman W. A., 1935. *Mesocoelium danforthi* n. sp. (*Dicrocoeliidae*) from a lizard, *Celestus pleii*, in Puerto Rico. Proc. Helminth. Soc. Washington, vol. 2, p. 64.
- Horta P. P., 1918. Distomatose pancreatica e glycosuria em bovinos. A lavoura, ano 22, f. 3/4, pp. 157—158.
- Ishii Y. C., 1935. Helminths of cows in Soochow. Lingnan Sci. Journ., vol. 14, pp. 605—610.
- Hsü H. F., 1939. Studies on the food and the digestive system of certain parasites—V. On the food of liver flukes. Chinese med. Journ., vol. 56, pp. 122—130.
- Hughes R. E., Higginbotham J. W. and Clary J. W. 1941. The trematodes of reptiles. Part. II. Host catalogue. Proc. Okl. Acad. Sci., vol. 21, p. 35—43.
- Hughes R. E., Higginbotham J. W. and Clary J. W. 1941. The trematodes of reptiles. Part. III. Conclusion. Proc. Okl. Acad. Sci., vol. 21, pp. 90—114.
- Hutchison, 1900. Fluke Duiker antelope. Agric. Journ. Cap Touen, vol. 17, p. 497.
- Imperial Bureau of Agric. Parasitology, 1931. Hand list of the helminth parasites of the rabbit. Journ. of Helminth, vol. 9, pp. 105—116.
- Imperial Bureau of Agric. Parasitology. 1931. The helminth parasites of Deer. Journ. of Helminth. vol. 9, pp. 217—245.
- Ishii N., 1942. New parasite records from the ruffed grouse. Journ. of Parasitol. vol. 28, Nr. 1, p. 92.
- Jacoby S., 1899. Mittheilungen über *Distomum heterolecithodes* Braun. Zool. Anz., Bd. 22, SS. 133—135.
- Jacoby S., 1899. Ein neuer Wirt für *Distomum heterolecithodes* Braun. Zool. Anz., Bd., 22, S. 300.
- Jacoby S., 1900. Beiträge zur Kenntnis einiger Distomen.—Arch. f. Naturgesch., Bd. 66, SS. 1—39.
- Jansen G. 1941. Sobre un novo tipo de *Dicrocoeliidae*, *Evandrocotyle paraense*, n. g. n. sp. Rev. Brasil. Biol., t. 1, f. 2, pp. 125—127.
- Janson J., 1889. Note explicative des objets exposés par l'Ecole Agricole et Forestière de Comaba. Paris.
- Janson J., 1893. Die Haustiere in Japan. IV. Die Krankheiten der Haustiere in Japan. Zwei parasitäre Krankheiten.—Arch. f. wissensch. u. prakt. Tierheilk.
- Janson J., 1895. Die Tierischen Parasiten bei japanischen Wiederkäuern. Mitt. deutsch. Ges. f. Natur. u. Völkerk. Ostasien u. Japan., Bd. 6, S. 272.
- Johnston S. J., 1912. On some trematode parasites of Australian frogs. Proc. Linn. Soc., N. S. Wales, vol. 37, pp. 285—362.

- Johnston S. J., 1913. Trematode parasites and the relationships and distribution of their hosts. Rep. Australian Ass. Advance Sci., vol. 14, pp. 272—275.
- Johnston S. J., 1916. On the trematodes of Australian birds. Journ. a. Proc. R. Soc. N. S. Wales, vol. 50, pp. 187—261.
- Johnston T. H., 1932. The parasites of the «stumpy-tail» lizard, *Trachysaurus rugosus*.— Trans. a. Proc. R. Soc. S. Australia, vol. 56, pp. 62—70.
- Joyeux C., 1937. La petite douve du foie. Presse médicale, année 45, Nr. 39, p. 741.
- Joyeux C. et Baer J. G., 1936. Quelques helminthes nouveaux et peu connus de la musaraigne, *Crocidura russula* Herm. (Première partie: trématodes et cestodes). Revue Suisse Zool., t. 43, pp. 25—50.
- Khalil M., 1923. On a trematode from the gall-bladder of *Naja bungarus* with an emendment of the genus *Xenopharynx* Nicoll, 1912. Journ. Helminth., vol. 1, pp. 29—33.
- Kobayashi H., 1915. Studies on Japanese endoparasitic Trematodes. Dobuts zasshi, Tokyo, vol. 27, pp. 1—7.
- Kobayashi H., 1918. A new host of *Eurytrema pancreaticum* (Jans.). Dobuts Zassh. Tokyo, vol. 30, Nr. 360, p. 422.
- Kobayashi H. 1921. On some digenetic trematodes in Japan. Parasitology, vol. 12, pp. 380—410.
- Kobayashi H., 1928. On the animal parasites in Chosen (Korea). Second report. Acta medicinalia in Keijo, II, pp. 1—16.
- Kossack W., 1910. Neue Distomen. Zentrabl. f. Bakt. Orig., Bd. 56, SS. 114—120.
- Ku Chang Tung, 1938. New trematodes from Chinese birds. Peking Nat. Hist. Bull., vol. 13, pp. 129—136.
- Lal M. B., 1937. Studies on the trematode parasites of birds. Part I. Value of different characters in the classification of avian trematodes. Proc. Indian Acad. Sci., vol. 5, pp. 33—44.
- Lane C., 1916. The correct names of the helminths of man. Indian med. Gaz., vol. 51, pp. 156—173.
- Leidy J., 1856. A synopsis of *Entozoa* and some of their Ectocongeners observed by the author. Proc. Acad. Nat. Sci. Phila, pp. 42—58.
- Lent H. e Freitas J. F. T., 1937. Pesquisas helminthologicas realizadas no estado de Para. I. Trematoda: *Fascioloidea*. Mém. Inst. O. Cruz, t. 32, pp. 449—480.
- Leuckart R., 1889. Die Parasiten des Menschen und die von ihnen herrührenden Krankheiten. Leipzig.
- Linstow O., 1883. Nematoden, Trematoden und Acanthocephalen gesammelt von Prof. Fedtschenko in Turkestan. Archiv f. Naturgesch., Bd. 49, SS. 274—314.
- Linstow O., 1888. Helminthologische Untersuchungen. Zool. Jahrb., Bd. 3, SS. 97—114.
- Linstow O., 1906. Helminthes from the Collection of the Colombo Museum. Spolia Zeylonica, vol. 3, pp. 153—188.
- Looss A., 1899. Weitere Beiträge zur Kenntnis der Trematoden fauna Aegyptens, zugleich Versuch einer natürlichen Gliederung des Genus *Distomum* Retzius.— Zool. Jahrb. System, Bd. 12, SS. 521—784.
- Looss A., 1902. Über neue und bekannte Trematoden aus Seeschildkröten, nebst Errörterungen zur Systematik und Nomenklatur.— Zool. Jahrb. Syst., Bd. 16, SS. 411—894.
- Looss A., 1907. On some parasites in the Museum of the School of Tropical Medicine, Liverpool. With a contribution on a case of distomiasis of the liver and rectum by Cuffey E.— Ann. Trop. Med. a. Parasit., v. 1, pp. 123—154.
- Looss A., 1907. Über einige zum Teil neue Distomen der Europäischen Fauna.— Zentrabl. Bakt. Orig. Bd. 43, SS. 604—613.
- Looss A., 1907. Notizen zur Helminthologie Aegyptens. VII. Über einige neue Trematoden der Aegyptischen Fauna.— Zentralbl. Bakt. Orig. Bd. 43, SS. 478—490.
- Looss A., 1908. Parasites from the gall-bladder of *Ceratophora*.— Spolia ceylonica, vol. 5, pp. 142—143.
- Lorincz F., 1933. Emberben észlolt dicrocoeliasis dendritica esetek Magyarországon.— Orvosi Hetilap, vol. 77, pp. 488—491.
- Luck K., 1940. Ein Fall von *Dicrocoelium lanceatum* in der Leber eines Rehes.— Eesti Loomaarstlik Ringvaade, vol. 16, Nr. 1, pp. 28—32.
- Lühe M., 1900. Über einige Distomen aus Schlangen und Eidechsen. Zentralbl. f. Bakt. Orig. Bd. 28, SS. 555—566.
- Lühe M., 1901. Zwei neue Distomen aus indischen Anuren.— Zentralbl. f. Bakt. Orig., Bd., 30, SS. 166—177.
- Lühe M., 1909. Parasitische Plattwürmer. I. Trematodes.— Süßwasserfauna Deutschlands. Heft 17. 217 SS.

- Macy R. W., 1931. New bat trematodes of the genera *Plagiorchis*, *Limatulum* and *Dicrocoelium*. Journ. of Parasitol., vol. 18, pp. 28—33.
- Maeder E., 1937. Ena obscura ein weiterer Zwischenwirt des Lanzettegels *Dicrocoelium lanceatum*. Zeitschr. f. Parasitenk., Bd. 9, SS. 261—262.
- Malan J. R., 1939. Some helminths of South African lizards. Onderstepoort Journ. Vet. Sci., vol. 12, pp. 21—74.
- Maldonado J. F., 1945. The life history and Biology of *Platynosomum fastosum* Kossak, 1910 (Trematoda: *Dicrocoeliidae*). Puerto Rico, J. Pub. Health Trop. Med., 21, pp. 17—39.
- Maldonado J. F., 1946. Ciclo vital y biología del *Platynosomum fastosum* Kossak, 1910. Rev. med. tropic. parasit. Habana, t. 12, p. 60—68.
- Martin W. E. and Gee D., 1949. A new species of *Eurytrema* (Trematoda: *Dicrocoeliidae*) from the slate-colored Junco. Journ. Parasitol., vol. 35, p. 61—66.
- Mattes O., 1933. Experimentelle Untersuchungen über die Zwischenwirtsfrage von *Dicrocoelium lanceatum*. Verh. deut. Zool. Ges., 35, pp. 227—231.
- Mattes O., 1936. Der Entwicklungsgang des Lanzettegels — *Dicrocoelium lanceatum*. Z. Parasitenk., 8, pp. 435—473.
- Mattes O., 1937. Abschlussbericht über die in den letzten Jahren im Marburger Zoologischen Institut durchgeführten Untersuchungen zur Aufdeckung des Entwicklungsganges des Lanzettegels. S. B. d. Beförd. ges. Naturwiss. zu Marburg, Bd. 72, H. 2, SS. 69—100.
- McIntosh A., 1933. *Dicrocoelium lasiuri* n. sp. (Trematoda, Digenea) from the liver of a red bat. J. Parasit. Urbana 20, pp. 137—138.
- McIntosh A., 1937. Two new avian liver flukes with a key to the species of the genus *Athesmia* Looss, 1899 (*Dicrocoeliidae*). Proc. Helminth. Soc. Washington, vol. 4, pp. 21—26.
- McIntosh A., 1939. A new dicrocoeliid trematode, *Eurytrema komareki* n. sp. from the white footed mouse. Proc. Helm. Soc. Washington, vol. 6, pp. 18—19.
- McIntosh A., 1939. A new dicrocoeliid trematode collected on the presidential cruise of 1938. Smithson. Miscellan. Coll., vol. 98, Nr. 16.
- McIntosh A. and McIntosh G., 1935. Additional notes on two bat parasites *Dicrocoelium lasiuri* McIntosh 1933 (Trematoda: *Dicrocoeliidae*) and *Litomosa americana* McIntosh, 1932 (Nematoda: *Filariidae*). Proc. Helminth. Soc. Washington, vol. 2, pp. 60—63.
- Mehlis E., 1825. Observationes anatomicae de Distomate hepatico e lanceolato. Göttingen.
- Mikl J., 1937. Notes on the embryonic development of *Dicrocoelium dendriticum* and *Eurytrema pancreaticum*. Okayarua — Igakkai — Zasshi, vol. 49, Nr. 7, pp. 1425—1476.
- Mo in R., 1859. Nuovi Myzelmintha raccolti eaesaminati. S. B. Akad. Wiss. Wien. Math. naturw. Kl., Bd. 37, SS. 818—854.
- Monticelli F. S., 1893. Studi sui trematodi endoparassiti. Zool. Jahrb., Suppl. 3, 299 pp.
- Mühling P., 1896. Beiträge zur Kenntnis der Trematoden aus dem Zoologischen Institut der Universität Königsberg. Arch. f. Naturgesch., Bd. 62, SS. 243—278.
- Mühling P., 1896. Beiträge zur Kenntnis einiger Trematoden. Zentralbl. Bakter. Orig., Bd. 20, SS. 558—590.
- Mühling P., 1898. Studien aus Ostpreussen. Helminthenfauna. Zool. Anz., Bd. 21, SS. 16—24.
- Mühling P., 1898. Die Helminthenfauna der Wirbeltiere Ostpreussens. Arch. f. Naturgesch., Bd. 64, SS. 1—118.
- Müller F. R., 1933. Zur Verbreitung des Lanzettegels bei Wildkaninchen und Hasen. S. B. naturf. Freunde. Berlin, Nr. 8/10, SS. 437—442.
- Narain D. and Das R. S., 1929. On the anatomy of two new trematodes of the genus *Dicrocoelium*, with a key to the species of the genus. Journ. Bombay Nat. Hist. Soc., vol. 33, Nr. 1/2, pp. 250—261.
- Neuhäus W., 1936. Untersuchungen über Bau und Entwicklung der Lanzettegel — Cercarie (*Cercaria vitrina*) und Klarstellung des Infektionsvorganges beim Endwirt. Z. Parasitenk., 8, pp. 431—473.
- Neuhäus W., 1938. Der Invasionsweg der Lanzettegelcercarie bei der Infektion des Endwirts u. ihre Entwicklung zum *Dicrocoelium lanceatum*. Z. Parasitenk., 10, pp. 476—512.
- Neveu-Lemaire M., 1936. Traité d'Helminthologie médicale et vétérinaire. Vigot Fr., Paris.
- Nicoll W., 1912. On two new trematode parasites from the Indian Cobra. Proc. Zool. Soc. of London, pp. 851—856.

- Nicoll W., 1914. The trematode parasites of North-Queensland. II. Parasites of birds. *Parasitology*, vol. 7, pp. 105—126.
- Nicoll W., 1914. Trematode parasites from animals dying in the Zoological Society's Gardens during 1911—1912. *Proc. of the Zool. Soc. London*, vol. 1, pp. 139—154.
- Nicoll W., 1915. A new liver fluke (*Platynosomum acuminatum*) from the Kestrel. *Proc. Zool. Soc. of London*, pp. 87—89.
- Nicoll W., 1923. A reference list of the trematode parasites of british mammals. *Parasitology*, vol. 15, pp. 236—252.
- Nicoll W., 1923. A reference list of the trematode parasites of british birds. *Parasitology*, vol. 15, pp. 151—202.
- Nicoll W., 1924. A reference list of the trematode parasites of british reptiles. *Parasitology*, vol. 16, pp. 329—331.
- Nicoll W., 1926. A reference list of the trematode parasites of british amphibia. *Parasitology*, vol. 18, pp. 14—20.
- Nicoll W., 1927. A reference list of the trematode parasites of man and the primates. *Parasitology*, vol. 19, pp. 338—351.
- Nöller W., 1928. Zu welchen Trematoden gehört *Cercaria rhopalocerca* Nöller, 1925?. *Sitz. Ber. d. Ges. Naturforsch. Freunde Zu Berlin*, SS. 154—162.
- Nöller W., 1929. Befunde bei Schnecken von Thüringer Schafweiden in einem Lanzettegelgebiete. *Tierärztl. Rundschau*, Jahrg. 35, Nr. 26, SS. 485—489.
- Nöller W., 1929. Parasitenbefunde bei Landschnecken von Thüringer Schafweiden in einem Lanzettegelgebiete. *Sitz. Ber. d. Gesellsch. Nat. Freunde zu Berlin*, SS. 96—140.
- Nöller W., 1932. Über die Rolle der Wildkaninchen als Lanzettegelträger in einem Thüringer Lanzettegelgebiete. *Tierärztl. Rundschau*, Bd. 38, SS. 190—191.
- Nöller W., 1932. Weitere Untersuchungen über Parasitenbefunde bei Landschnecken von Thüringer Schafweiden in einem Lanzettegelgebiete. *Sitz. Ber. d. Gesellsch. Nat. Freunde zu Berlin*, SS. 3—62.
- Nöller W. und Korkhaus R., 1929. Das Verhalten von Eiern des Lanzettegels in Schnecken von Thüringer Schafweiden. *Tierärztl. Rundschau*, Bd. 35, SS. 677—680, 722—723.
- Nöller W. und Enigk K., 1933. Ein *Platynosomum* beim Steinhuhn. *Sitz. Ber. d. Gesellsch. Nat. Freunde zu Berlin*, Nr. 8/10, SS. 419—423.
- Nöller W. und Enigk K., 1933. Weitere Cercarienbefunde bei Landschnecken. *Sitz. Ber. d. Gesellsch. Nat. Freunde zu Berlin*, Nr. 8/10, SS. 424—437.
- Northup F. E., 1928. Notes on some trematodes from bats.—*Journ. Bureau Res. Soc. Rangoon*, vol. 18, pp. 80—97.
- Ochi S., 1930. Über die Entwicklungsgeschichte von *Mesocoelium brevicaudatum* n. sp. *Ohayama Igakkai-Sasshi*, Jahrg. 42, Nr. 2, SS. 388—402.
- Odhner T., 1910. *Dicrocoelium dendriticum* (Rud.) der richtige Name des kleinen Leberegels. *Zool. Anz.*, Bd. 35, SS. 317—318.
- Odhner T., 1911. Nordostafrikanische Trematoden grössenteils vom Weissen Nil.—Fascioliden. *The Swedish zool. Exped. to Egypt. and the White Nil*, 1901, 169 pp.
- Okland F., 1935. Om utbredelse og hyppighet av den lille leverikte (*Dicrocoelium lanceatum* Stiles et Hassall) in Norge. *Norsk Veterinaetidskr.* vol. 47, pp. 22—26; 96—100; 162—166.
- Olsson P., 1876. Bidrag till skandinaviens helminthfauna I. *Kongl. Svenska vetensk. Akad. Handl. Stockholm*, v. 14, pp. 1—35.
- Orr W., 1938. Observations on the occurrence of animal parasites. *Rep. Veterin. Dept. Malaya*, year 1937, pp. 93—100.
- Pandazis G., 1935. Recherches sur la faune helminthologique de la Grèce. I. Les helminthes signalés chez l'homme. *Acta Inst. et Mus. zool. Univ. Atheniensis*, t. I, pp. 27—32.
- Pande B. P., 1939. On the trematode genus *Lyperosomum* Looss, 1899 (*Dicrocoeliidae*), with a description of two new species from India. *Proc. Nat. Acad. Sci. India*, vol. 9, Nr. 1, pp. 15—21.
- Patwardhan S. S., 1935. Three new species of trematodes from birds. *Proc. Indian Acad. Sci.*, vol. 2, pp. 21—28.
- Pereira C. e. Cuocollo R., 1941. Trematoides brasileiros do genero *Mesocoelium* Odhner. *Arq. Inst. Biol. S. Paulo*, t. II, pp. 399—412.
- Petri L. H., 1942. Two new dicrocoeliid trematodes from birds. *Trans. Amer. Micr. Soc.*, vol. 61, pp. 57—61.

- Piana F., 1882. Le Cercarie nei molluschi studiati in rapporto colla presenza del Distoma epatico e del Distoma lanceolato nel fegato dei ruminanti domestici. Clinica Veterinaria, t. 5, pp. 306—314.
- Pinto C., 1935. Variações morfológicas observadas no *Eurytrema fastosum* (Kossack, 1910) — Trematoda: *Dicrocoeliidae*. O Campo, out., pp. 50—52.
- Pinto C. e Almeida J. L., 1935. Sinopse dos helmintos dos animais domésticos do Brasil. O Campo, agosto, pp. 54—63.
- Pinto C. e Almeida J. L., 1937. Synopsis des helminthes des animaux domestiques du Brésil. — Сб. работ по гельминтологии, посвящ. проф. К. И. Скрябину, стр. 469—282.
- Poche E., 1925. Das System der *Platodaria*. Arch. f. Naturgesch. Ig. 91, Abt. A., H. 2—3, SS. 1—459.
- Pontallié A., 1853. Observations sur deux distomes. Ann. Sci. Nat. Zool., 7-me série, t. 19, pp. 103—105.
- Pratt H. S., 1902. Synopsis of North-American invertebrates. XII. The Trematode. Amer. Naturalist, vol. 36, pp. 887—910; 953—979.
- Pratt I. and Cutress C., 1949. *Olsoniella chivosca* n. sp. (Trematoda: *Dicrocoeliidae*) from the western evening grossbeak. Journ. Parasitol., vol. 35, N 4, pp. 361—363.
- Price E., 1928. New helminth parasites from central American mammals. Proc. U. S. Nat. Mus., vol. 73, Art. 4, pp. 1—7.
- Price E. W. and McIntosh A., 1935. A new trematode *Lyperosomum moneteron* n. sp. (*Dicrocoeliidae*) from a robin. Proc. Helminth. Soc. Washington, vol. 2, pp. 63—64.
- Proença C., 1935. Notas de helmintologia veterinaria. Bol. veterin. do Exército, ano 2. Nr. 12, pp. 274—275.
- Purvis G. B., 1931. The species of *Platynosomum* in felines. Veterin. Rec., vol. II, pp. 228—229.
- Purvis G. B., 1931. The species of *Eurytrema* in domestic ruminants. Veterin. Rec., vol. II, pp. 583—584.
- Purvis G. B., 1931. Further parasites of domestic animals in Malaga. Veterin. Rec., vol. II, p. 750.
- Purvis G. B., 1933. The excretory system of *Platynosomum concinnum* (Braun, 1901), syn. *P. fastosum* (Kossack, 1910) and *P. planicipitis* (Cameron, 1928). Veterin. Rec., vol. 13, p. 565.
- Purvis G. B., 1933. On the apparent non-pathogenicity of the trematodes *Eurytrema pancreaticum* (Janson, 1889) and *Platynosomum concinnum* (Braun, 1901). Veterin. Rec., vol. 13, pp. 1063—1064.
- Querner F. R., 1929. Zur Histologie des Excretionsgefäßsystems digenetischer Trematoden. Zeitschr. f. Parasitenk., Bd. I, SS. 489—561.
- Railliet A., 1890. Les parasites des animaux domestiques au Japon. Le Naturalist, 12 année, 2 sér., Nr. 79, pp. 142—143.
- Railliet A., 1895. Traité de Zoologie médicale et agricole. 2-ème édition, 1303 pp.
- Railliet A., 1896. Quelques rectifications à la nomenclature des parasites, Rés. méd. vétér. Alfort (sép. pp. 1—6).
- Railliet A., 1900. Trématodes hépatiques des oiseaux. C. R. Soc. Biol., sér. II, Nr. 2, pp. 239—242.
- Railliet A., 1924. Les helminthes des animaux domestiques et de l'Homme en Indochine. Bull. Soc. Zool. France, t. 49, pp. 589—608.
- Railliet A., Henry A. et Joyeux C., 1912. Sur deux trématodes des primates. Bull. Soc. Path. éxot., t. 5, pp. 835—837.
- Railliet A. et Marotel G., 1898. La douve pancréatique parasite des boeufs et des buffles en Cochinchine. Arch. de Parasitol., t. 1, pp. 30—38.
- Ribeiro D. J., 1941. Contribuição para o conhecimento da fauna helmintologica de Minas Gerais, *Eurytrema minensis* n. sp. parasito de *Dasytus novemcinctus* L. Rev. Bras. Biol., t. 1, f. 2, pp. 23—27.
- Rizzo A., 1902. La fauna elmintologica dei rettili nella provincia di Catania. Arch. de Parasitol., t. 6, pp. 26—41.
- Rudolphi K. A. 1803. Neue Beobachtungen über die Eingeweidewürmer. Arch. Zool. u. Zoot. Braunschweig Bd. 3, H. 2, SS. 1—32.
- Rudolphi C. A., 1819. Entozoorum synopsis cui accedunt mantissa duplex et indices locupletissimi. I vol., Berlin. X + 811 pp.
- Ruiz J. M. e Leao A. T., 1943. Notas helmintologicas, 3. Nova especie de trematode do genero *Infidum* Travassos, 1916 (*Dicrocoeliidae*) parasito de ofidios brasileiros. Mem. Inst. Butantan, t. 16, pp. 203—206.

- Sandground, J. H., 1929. A new liver fluke from a monkey and new parasitic round worms from various african animals.— Proc. U. S. Nat. Mus., vol. 75, Art. 12, pp. 1—11.
- Sandground J. H., 1937. Three new microcoeliids from African *Cheiroptera*. Сб. работ по гельминтологии, посвящ. проф. К. И. Скрябину, стр. 581—585.
- Sandosham A. A., 1951. On two helminthes from the orang utan: *Leipertrema rewelli* n. g. n. sp. and *Dirofilaria immitis* (Leidy, 1856). Journal of Helminthology, vol. 25, N 1—2, pp. 19—26.
- Schmid F., 1937. Zur Bekämpfung des Lanzettegelbefalles bei Schafen. Berl. Tierärztl. Wochenschr., Bd. 53, SS. 805—808.
- Senoo H., 1907. Distomas japoneses. Dobuts Zool. Tokyo, vol. 19, pp. 121—124, 354—359.
- Sewell R. B. S., 1924. On *Mesocoelium sociale* (Lühe). Rec. Indian Museum, vol. 19, pp. 81—95.
- Sprehn C. S., 1936. Über die Bekämpfung des kleinen Leberegels *Dicrocoelium lanceatum* mit dreiwertigen Antimon-präparaten. Berlin. Tierärztl. Wochenschr., Bd. 52, S. 584.
- Stiles C. W. and Hassall A., 1894. A preliminary catalogue of the parasites contained in the collections of the United States Bureau of Animal Industry, United States Army Medical Museum, Biological Department of the University of Pennsylvania (coll. Leidy) and in the coll. Stiles and coll. Hassall. Veterinary Mag., pp. 245—253; 331—354.
- Stiles C. W. and Hassall A., 1896. Notes on parasites. Veter. mag. Philadelphia vol. 3, pp. 151—161.
- Stiles C. W. and Hassall A., 1898. Notes on parasites. 48. An inventory of the genera and sub-genera of the trematode family *Fasciolidae*. Arch. de Parasitol., t. I, pp. 81—99.
- Stiles C. W. and Hassall A., 1926. Key-catalogue of the worms reported for man. Hygienic Labor. Bull., N 142, pp. 69—196.
- Stiles C. W. and Hassall A. 1929. Key-catalogue of parasites reported for primates (monkeys and lemurs) with their possible public health importance. U. S. Treas. Dept. Hyg. Labor. Bull., Nr. 152, pp. 400—401.
- Stiles C. W. and Nolan M. O., 1931. Key-catalogue of parasites reported chiroptera (bats) with their possible public health importance. Nation Inst. Health Bull., Nr. 155, pp. 603—789.
- Stiles C. W. and Stanley S. F. 1932. Key-catalogue of parasites reported for insectivora (moles, shrew, etc.) with their possible public health importance. Nation. Inst. health Bull., Nr. 159, pp. 791—911.
- Stiles C. W. and Baker C. E., 1935. Key-catalogue of parasites reported for carnivora (cats, dogs, bears etc.) with their possible public health importance. Nat. Inst. health. Bull., Nr. 163, pp. 913—1223.
- Stossich M., 1892. I distomi degli uccelli. Bol. Soc. Adriatica Sc. nat. Trieste, t. 13, Nr. 2, pp. 1—54.
- Stroh G., 1920. Zur Distomatose beim Wild (Reh, Gemse, Hase, Rot- und Damwild). Münch. Tierärztl. Wochenschr., Bd. 81, SS. 385—389.
- Strong R. P. C., Shattuck G. C., Bequaert J. C. and Wheeler R. H., 1925. Medical report of the Hamilton Rice seventh expedition to the Amazon in conjunction with the department of Tropical Medicine of Harvard University.
- Stunkard H. W., 1923. A new liver fluke from the monkey. Anat. Rec., vol. 24, pp. 363—379. Abstracts.
- Stunkard H. W., 1923. On the structure, occurrence and significance of *Athesmia foxi*, a liver fluke of american monkeys. Journ. Parasitol., vol. 10, pp. 71—79.
- Stunkard H. W. 1947. A microcoeliid trematode, *Eurytrema vulpis* n. sp. provis. from the pancreatic ducts of the red fox. Journ. Parasitol., vol. 33, pp. 459—466.
- Stunkard H. W. et Goss L. Y., 1950. *Eurytrema brumpti* Railliet, Henry et Joyeux, 1912 from the pancreas and liver of african anthropoid apes. Journ. of Parasitology, vol. 36, N. 6, pp. 574—578.
- Sukru Oytun H., 1938. Die endoparasitären Krankheiten der Schafe Anatoliens. Studien über die wirtschaftliche Bedeutung der Helminthenkrankheiten und Versuche zu ihrer exacten Diagnose.— Arb. Joeksek. Zimaat Estit. Ankara, Bd. 43, SS. 1—21.
- Szidat L., 1924. Beiträge zur Kenntnis ostpreussischer Trematoden. Beitrag aus der Tierkunde. Widmungsschr. f. Prof. Dr. M. Braun, Königsberg.
- Szidat L., 1934. *Dicrocoelium lanceolatum* Rud., 1803 in den Gallengängen eines Elches (*Alces alces* L.). Zeitschr. Parasitenk., Bd. 7, SS. 392—394.

- Szidat L., 1935. Neue Entdeckungen aus dem Gebiet der Parasiten des Menschen. Schriften physical-ökonom. Ges. Königsberg, Bd. 68, SS. 294—298.
- Szidat L. u. Nöller W., 1929. Die Verbreitung des Leberegels in Ostpreussen. Tierärztl. Rundschau. Bd. 35, Nr. 3, SS. 229—236.
- Tang C. C., 1941. Contribution to the knowledge of the helminthfauna of Fukien. I. Avian, reptilian and mammalian trematodes. Peking Nat. Hist. Bull., vol. 15, pp. 299—316.
- Tang C. C., 1950. Studies on the life history of *Eurytrema pancreaticum* Janson, 1889. Journ. of Parasitology, vol. 36, N 6, pp. 559—572.
- Torres C. M. e Pinto C. 1936. Processos patogenicos determinados pelos trematoides *Eurytrema jastosum* e *E. coelomaticum*. Mem. Inst. O. Cruz., t. 31, f. 4, pp. 731—746.
- Travassos L., 1915. Informaço es sobre os helminthos parasitos de homem encontrados no Brasil. Tese de Livre Docencia Rio de J., 33 pp.
- Travassos L., 1916. Informaço es sobre a fauna helminthologica sul-fluminense. Brasil Medico, ano 30, f. I, p. 50.
- Travassos L., 1916. Trematodeos novos. Brasil Medico, Nr. 33, pp. 257—259.
- Travassos L., 1917. Especies brasileiras do genero *Lyperosomum* Looss, 1898. Buenos-Aires. I-o Congr. Sul. Amer. Microbiol. et Patol., 1916. pp. 737—745.
- Travassos L., 1917. Contribuiçao para o conhecimento da fauna helminthologica sul-fluminense. Brasil Medico, ano 31, f. 18, p. 149.
- Travassos L., 1918. Helminthos parasitos do homem encontrados no Brasil. Rev. Soc. Bras. Sci., t. 2, pp. 207—208.
- Travassos L., 1918. Helminthos parasitos de animaes domesticos. Rev. de veterinaria e zootechnia, anno VIII, f. I pp. 3—15.
- Travassos L., 1919. Contribuiçao para a sistematica dos *Dicrocoeliinae* Looss, 1899. Arch. da esc. sup. de agric. e med. vet. Nietheroy, t. III, f. 1/2, pp. 7—24.
- Travassos L., 1921. Trematodeos novos III. Brasil-Medico, ano 35, f. 1, pp. 221—222.
- Travassos L., 1922. Informaço es sobre a faune helminthologica de Matto Grosso. Folia medica, ano III, Nr. 24, pp. 187—190.
- Travassos L., 1924. Contribuiçao para o conhecimento dos helminthos dos batrãquios do Brasil. I. Trematodeos intestinaes. Ciênci a médica, Anno 2, f. 2, pp. 618—628.
- Travassos L., 1929. Fauna helminthologica de Matto Grosso (Trematodeos, I parte). Mem. Inst. O. Cruz, t. 21, f. 2, pp. 309—372.
- Travassos L., 1941. Sobre o *Lyperosomum rudectum* Braun, 1901. Un equivoco no descripçao deste parasito.— Rev. Bras. Biol., t. I, f. 1, pp. 33—35.
- Travassos L., 1941. *Eurytrema ellipticum* n. sp. (Trematoda — *Dicrocoeliidae*). Rev. Bras. Biol., t. I, f. 2, pp. 201—202.
- Travassos L., 1941. *Lutztrema* n. g. (Trematoda: *Dicrocoeliidae*). Mem. Inst. O. Cruz, t. 36, f. 3, pp. 335—343.
- Travassos L. 1942. Novo *Dicrocoeliidae* parasito de carnivores: *Pseudathesmia paradoxa* n. g. n. sp. com uma note sôbre o genero *Athesmia* Looss, 1899. Rev. Bras. Biol., t. 2, f. 3, pp. 349—351.
- Travassos L., 1944. Revisão da Fam. *Dicrocoeliidae* Odhner, 1911. Monogr. Inst. Os. Cruz, Nr. 2, pp. 357.
- Travassos L., 1945. Notas sobre *Dicrocoeliidae*. Memorias do Instituto Oswaldo Cruz., Tom. 42, fasc. 3, pp. 629—633.
- Travassos L., Pinto C. e Muniz J., 1928. Excursao cientifica ao Estado de Matto Grosso, na zona do pantanal (margens dos rios S. Lorenzo e Cuiaba) realizada em 1922. Mem. Inst. O. Cruz, t. 20, pp. 249—269.
- Travassos L., Freitas J. F. T. e Lent H., 1939. Relatorio da excursao cientifica do Instituto Oswaldo Cruz realizada na zona da Estrada de Ferro Noroeste do Brasil em outubro de 1938. Pesquisas helminthologicas. Bolet. Biol. (N. S.), t. 4, f. 2, üü. 220—249.
- Travassos L. e Freitas J. F. T., 1941. Relatôrio da excursao cientifica realizada na zona da Estrada de Ferro Noroeste do Brasil no julho de 1939. Mem. Inst. O. Cruz, t. 35, pp. 525—556.
- Tubanguí M. A., 1925. Metazoan parasites of Philippine domesticated animals.— Philippine Journ. Sci., vol. 28, N 1, pp. 13—15.
- Tubanguí M., 1928. Trematode parasites of Philippine vertebrates. Philippine Journ. Sci., vol. 36, pp. 351—369.
- Tubanguí M., 1929, *Paradistomum gregarium* a new name for the trematode *Paradistomum magnum*. Philippine Journ. Sci., v. 38, pp. 443.

- Tubangui M., 1931. Trematode parasites of Philippine vertebrates. III. Flukes from fish and reptiles. Philippine Journ. Sci., vol. 44, pp. 417—423.
- Tubangui M., 1933. Trematode parasites of Philippine vertebrates. VI. Descriptions of new species and classification. Philippine Journ. Sci., vol. 52, pp. 157—197.
- Tubangui M. a. Masilungan V., 1935. Trematode parasites of Philippine vertebrates, VIII. Additional records of new species. Philippine Journ. of Sci., vol. 58, pp. 435—444.
- Viana L., 1924. Tentativa de catalogação das especies brasileiras de trematodeos. Mem. Inst. O. Cruz, t. 17, f. 1, pp. 95—227.
- Viguera J. P., 1942. *Athesmia parkeri* n. sp. (Trematoda: Dicrocoeliidae) parasito del intestino de *Artibeus jamaicensis parvipes* (Chiroptera). Mem. Soc. Cubana Hist. Nat. Felipe Pocy, t. 16, f. 1, pp. 67—69.
- Vogel H., 1929. Beobachtungen über *Cercaria vitrina* und deren Beziehung zum Lanzettegelproblem. Arch. Schiff- u. Tropen-Hyg., Bd. 33, pp. 474—489.
- Vogelsang E. G. e Cordero, E. H., 1928. Dos nuevos trematodes dos genero *Platynosomum*. Bolet. del Inst. de clinica quiurgica, anno IV.
- Van Volkenberg H. L., 1938. Check list of parasites found among principal domestic animals in Puerto Rico. Proc. Helminth. Soc. Washington, vol. 5, Nr. 1, pp. 7—8.
- Wadowski S., 1939. Notatki parazytologiczne. Pamiętnik Państwowego Instytutu Nauk Gospodarstwa Wiejskiego w Pulawach. Wydz. veterin., Nr. 2, st. 105—139.
- Walton A. C., 1938. The trematodes as parasites of amphibia. Bibliography. Contrib. Biol. Labor. of Knox Coll, Nr. 63.
- Walton A. C., 1938. The trematodes as parasites of amphibia. List of hosts. Contrib. Biol. Labor. of Knox Coll. Nr. 62.
- Ware F., 1923. Some members of the family *Dicrocoeliidae* affecting domestic animals. Journ. Compar. Path., 36, pp. 33—39.
- Wiese E., 1934. Distomatose host storfe i Vestfold Norsk. vet. Tidsskr., vol. 46, pp. 489—502.
- Wolffhügel K., 1935. Zu Almarza N. «Die Leberegel des Schafes». Zeitschr. Infektionskr. d. Haustiere, Bd. 38, SS. 196—198.
- Wu K. a. Chen C. Z., 1941. A preliminary report on the animal helminths from Shanghai abattoirs. Peking Nat. Hist. Bull., vol. 15, pp. 217—223.
- Yamaguti S., 1933. Studies on the helminth fauna of Japan. Part 1. Trematodes of birds, reptiles and mammals. Japanese Journ. Zool., vol. 5, pp. 1—134.
- Yamaguti S., 1936. 17. Studies on the helminth fauna of Japan. Part 14. Amphibian trematodes. Japanese Journ. Zool., vol. 6, pp. 555—576.
- Yamaguti S., 1939. Studies on the helminth fauna of Japan. Part 25. Trematodes of birds IV. Japanese Journ. Zool., vol. 8, pp. 130—210.
- Yamaguti S., 1939. Studies on the helminth fauna of Japan. Part 27. Trematodes of mammals. II. Japanese Journ. Med. Sci., vol. 1, pp. 131—151.
- Yamaguti S., 1941. Studies on the helminth fauna of Japan. Part 32. Trematodes of birds. IV. Japanese Journ. Zool., vol. 9, pp. 321—341.

DICROCOELIIDAE Odhner, 1910

Body more or less elongated, mostly oblate. Muscles poorly developed. Body spines present or absent. Suckers near each other. Pharynx present, esophagus and ceca of variable lengths but never reaching the posterior end. Excretory vesicle simple, tubular. Testes generally near the acetabulum (in *Ityogonimus* in the posterior end). Cirrus sac small, the largest part lying anterior to acetabulum. Ovary generally posttesticular, to right or left of midline. Small seminal receptacle. Coiled uterus fills body posterior to gonads. Vitellaria do not extend to posterior end of body. Genital pore median, anterior to acetabulum. Laurer's canal present. Eggs very numerous, brown colored. Hosts: Amphibia, reptiles, birds, and mammals. In the liver, gall bladder, pancreas, intestine.

Type genus: *Dicrocoelium*

Other genera: *Dicrocoelium* Dujardin ✓
Athemmia Looss, 1899
Eurytrema Looss ✓
Pintneria Poche (syn. *Hoploderma* Cohn) ✓
Platynotrema Nicoll ✓
Xenopharynx Nicoll, - to *Plagiorchiidae* by Sinha, 1937
Platynosomum Dooss ✓
Lypersomum Looss ✓
Brodania Gedoelst ✓
Mesocoelium Odhner ✓
Paradistomum Kossak ✓
Infidum Travassos ✓
- *Acanthatrium* Faust ✓ 1919 moved to *Lecithodendriidae*
Lyperotrema Travassos, 1919 ✓
~~*Ityogonimus* Lake *Harmostomidae*~~
- *Dictyohograptum* Travassos ✓ 1919
Oswaldoia Travassos ✓
- *Hepatotrema* Stunkard 1923 syn. of *Athemmia* Looss, 1899 ✓
Contorchis Price ✓
Euparadistomum Tubangui, 1931 ✓
Proacetabulorchis Gogate, 1940 ✓

DICROCOELIIDAE Odhner, 1911

Family diagnosis. — Body flat oval, elliptical, lanceolate or claviform to subcylindrical, rarely subglobular, spined or not. Oral sucker subterminal, pharynx present, esophagus short, ceca simple, of variable length. Acetabulum in anterior half of body, exceptionally absent.

Testes situated symmetrically, tandem, or obliquely in hindbody, rarely in forebody or acetabular zone, exceptionally one in forebody and the other in hindbody. Cirrus pouch well developed, pre-acetabular. Genital pore median, between two suckers. Ovary median or submedian, post-testicular. Receptaculum seminis and Laurer's canal present. Vitellaria follicular, usually extracecal and limited in extent, sometimes more or less extensive, exceptionally unilateral. Uterus occupying most of hindbody, may intrude into forebody; eggs numerous, dark brown when mature. Excretory vesicle simple, giving off collecting stems at its anterior end in form of a T or Y, or sideways. Flame cell formula of $2 \times 6 \times 2$ type after Faust. Parasitic in liver, bile ducts, gall bladder, intestine or pancreas, etc. of amphibians, reptiles, birds and mammals.

Type genus: *Dicrocoelium* Dujardin, 1845.

Dicrocoeliidae

Dicrocoeliinae Looss, 1899

Dicrocoeliidae. Body spines lacking or present. Acetabulum usually larger than oral sucker. Ceca extending at least $2/3$ of body length. Testes behind acetabulum, sometimes near or over it, symmetrical, oblique, or both median. Ovary posttesticular. Vitellaria usually extending posterior to the testes, not extending anterior to acetabulum. 19 genera.

Above from Sprehn 's Lehrbuch

Dicrocoeliinae Looss, 1899

Subfamily diagnosis. — Dicrocoeliidae: Body flat, oval, elliptical, lanceolate to subcylindrical, spined or not. Oral sucker large or small, pharynx usually small. Esophagus short. Ceca variable in length. Acetabulum variable in size, at varying levels in anterior half of body, occasionally equatorial. Testes symmetrical, diagonal or tandem, intercecal, exceptionally extracecal, pre- or post-acetabular, exceptionally separated one from the other by acetabulum. Cirrus pouch preacetabular, postbifurcal, or ventral to esophagus. Genital pore median, rarely submedian, postbifurcal, bifurcal or esophageal. Ovary median or submedian, posttesticular. Vitellaria lateral, limited in extent, or more or less extensive, exceptionally unilateral. Uterus may or may not overreach ceca laterally, sometimes intruding into forebody but not occupying most of body. Excretory vesicle with oblique or transverse arms.

Dicrocoeliinae Looss, 1899, char. emend.

Diagnosis.

Dicrocoeliidae mit in einer Linie hintereinander oder diagonal gelegenen Testes (Durchschnittsmerkmal einer gegebenen Population; im Durchschnitt niemals Testes völlig parallel nebeneinander gelegen); Ovarium und zumindest hinterer Testis hinter dem Bauchsaugnapf gelegen. Parasiten der Leber (Gallengänge) oder Gallenblase von Säugetieren oder Vögeln.

Typische Gattung: *Dicrocoelium* DUJARDIN, 1845.

Non.inat-Tribus: Dicrocoeliini YAMAGUTI, 1958; char. emend.

From Odening, 1964

Key to subfamilies of Dicrocoeliidae from birds.

- Acetabulum absent; uterus occupying nearly whole body Stromitrematinae
 Acetabulum present Dicrocoeliinae

Dicrocoeliinae Looss, 1899

Subfamily diagnosis. — See p. 827.

Key to tribes of Dicrocoeliinae from birds

1. Testes preacetabular 2
 Testes postacetabular 3
2. Body elliptical to fusiform; testes symmetrical; vitellaria
 largely in acetabular zone Platynotrematini
 Body long, slender; testes tandem or juxtaposed; vitellaria
 entirely postacetabular Proacetabulorchiini
3. Body oval, elliptical, fusiform to lanceolate; testes sym-
 metrical; immediately postacetabular Eurytrematini
 Body lanceolate or more elongate, more or less slender,
 occasionally filiform; testes diagonal or tandem 4
4. Vitellaria unilateral Athesmini
 Vitellaria bilateral 5
5. Ceca single or somewhat rudimentary when double . Lutztrematini
 Ceca double, long 6
6. Body more or less lanceolate; testes and ovary close to one
 another 7
 Body slender, occasionally filiform; testes and ovary
 separated one from another by uterus 8
7. Body widened in acetabular zone; acetabulum definitely
 larger than oral sucker Brachydistomini
 Body widened behind middle; acetabulum subequal to
 oral sucker Dicrocoeliini
8. Vitellaria commencing at or behind ovarian zone, ex-
 tending a short distance Brachylecithini
 Vitellaria commencing at or behind testicular zone and
 more extensive Lypersomini

Key to subfamilies of Dicrocoeliidae from reptiles

- Testes extracecal; genital pore immediately preacetabular
 Anchitrematinae
 Testes usually entirely or largely intercecal; genital pore
 definitely anterior to acetabulum Dicrocoeliinae

Dicrocoeliinae Looss, 1899

Subfamily diagnosis. — See p. 827.

Key to tribes of Dicrocoeliinae from reptiles

1. Body rounded or oval; testes symmetrical, pretesticular;
 uterus occupying most of body Euparadistomini
 Body elongate, somewhat broadened posteriorly; testes
 diagonal, largely preacetabular (posterior one dorsal
 to acetabulum); uterine coils confined to hindbody . **Pintneriini**
 Body oval to pyriform; testes symmetrical, acetabular
 or postacetabular; uterine coils mainly in hindbody 2
2. Genital pore submedian; testes medial to ceca Infidini
 Genital pore median; testes ventral to ceca Paradistomini

Key to subfamilies of Dicrocoeliidae from mammals

- Testes extracecal; genital pore immediately preacetabular
..... Anchitrematinae
Testes entirely or largely intercecal; genital pore definitely
anterior to acetabulum Dicrocoeliinae
Testes largely extracecal; ceca reaching a little beyond testes;
vitellaria at cecal ends, tending to meet in median line;
excretory vesicle very short Leiptrematinae

Key to tribes of Dicrocoeliinae from mammals

1. Body rounded or oval; testes symmetrical, preacetabular;
uterus occupying most of body Euparadistomini
Body oval, fusiform, or more elongate; testes symmetrical,
postacetabular; uterus may or may not intrude into
forebody 2
Body fusiform or more elongate; testes diagonal, post-
acetabular 3
Body fusiform; testes separated by acetabulum Controrchiini
Body slender; testes diagonal or tandem 4
2. Lateral edges of body expanded and serrate in region of
ovary and vitellaria; ceca half-long Brodeniini
Lateral edges not expanded and serrate in region of ovary
and vitellaria; ceca long Eurytrematini
3. Body widened behind middle; testes and ovary close to
one another Dicrocoeliini
Body slender; acetabulum, testes and ovary separated one
from another by uterus Lypersomini
4. Vitellaria unilateral Athesmiini
Vitellaria bilateral Brachylecithini

Dicrocoeliini n. trib. YAMAGUTI, 1958

Tribe diagnosis. — Dicrocoeliinae: Body fusiform or more elongate. Oral sucker prominent, pharynx small or moderately large. Esophagus short, ceca terminating at some distance from posterior extremity. Acetabulum large or small, in anterior third of body. Testes diagonal, immediately or a little behind acetabulum. Cirrus pouch pre-acetabular; genital pore near intestinal bifurcation or ventral to esophagus. Ovary submedian, in middle third of body. Vitellaria in posttesticular or post-ovarian lateral fields. Uterus not intruding into forebody. Excretory vesicle giving off arms in form of a Y.

Key to genera of Dicrocoeliini from mammals

1. Ovary and vitellaria in posterior half of body . . . *Metadelphis*
Ovary and vitellaria largely in middle third of body . . *Dicrocoelium*

E. Tribus Dicrocoeliini YAMAGUTI, 1958; char. emend.

Diagnosis.

Dicrocoeliinae mit 2 Darmschenkeln, deren Gonaden sämtlich hinter dem Bauchsaugnapf liegen (bzw. vorderer Testis diesen höchstens etwas überlappend); mit in beiden Körperseiten ausgebildeten Dötterstöcken, die aus relativ kleinen Dötterfollikeln zusammengesetzt sind; mit deutlichem Zwischenraum zwischen den Dötterstöcken beider Körperseiten (Dötterbereich insgesamt nicht mehr als etwa ein Drittel der Körperbreite einnehmend). Parasiten der Leber (Gallengänge) oder Gallenblase von Säugetieren oder Vögeln.

Typische Gattung: *Dicrocoelium* DUJARDIN, 1845.

FROM ODENING, 1964

In a recent monograph, Travassos (1944) recognized 25 genera and subgenera with approximately 136 species as comprising the subfamily Dicrocoeliinae Looss, 1899, family Dicrocoeliidae Odhner, 1910. About 84 species belonging to 16 genera and subgenera are recorded from avian hosts throughout the world. The present paper reports the presence of 9 genera and 22 species of dicrocoeliids from North American birds. Three of these species, *Athesmia wehri* McIntosh, 1937, from the prairie sharp-tailed grouse, *Pedioecetes phasianellus campestris*, in Montana, *Concinnum* (= *Eurytrema*) *ludoviciana* (Petri, 1942) from the rose-breasted grosbeak, *Hedymeles ludovicianus*, in Nebraska, and *Platynosomum* (= *Dicrocoelium*) *illiciens* (Braun, 1901) from the broad-winged hawk, *Buteo platypterus*, in Ohio and Wisconsin, have not been studied by us. Of the remaining 19 species of dicrocoeliids from North American bird hosts 10 are described as new. The hosts, geographic distribution, and authority

for the 22 species recorded from North American birds are given in table 1.

Insofar as the over-all taxonomy of the Dicrocoeliinae is concerned it is here important only to point out certain duplication of taxonomic effort that has appeared in the literature within recent years. In studying a section of the subfamily, Bhalerao (1936) suggested that the then 17 valid species assigned to the genus *Eurytrema* Looss, 1907, showed characters sufficiently distinct for their separation into five subgenera. The names *Pancreaticum*, *Concinnum*, *Conspicuum*, and *Skrjabinus* in addition to *Lubens*, suggested by Travassos in 1920, were proposed for these five subgenera. For the characters on which this separation was made the reader is referred to Bhalerao's original paper.

Strom (1940), in working with dicrocoeliid trematodes from Eurasian hosts, accepted Bhalerao's division of the genus *Eurytrema* but elevated the subgenera *Lubens*, *Conspicuum*, *Concinnum*, and *Skrjabinus* to generic rank. He accepted the first three of these subgenera as defined by Bhalerao and retained the species as allocated in the original paper, although transferring a more recently described species, *Eurytrema epomopsis* Sandground, 1937, to the genus *Concinnum*. After restudying the species *Eurytrema skrjabinus* Isiatshikoff, 1920, and *E. koschewnikowi* Skrjabin and Massino, 1925, the only two species included in the subgenus *Skrjabinus* by Bhalerao, Strom redefined the genus to include forms in which (1) the genital pore is ventral to or near the pharynx; (2) the vitellaria occupy the lateral margins of the body and extend from the region of the acetabulum (or behind this level) to a point considerably beyond the ovary; and (3) the uterus has numerous loops occupying the whole body posterior to the acetabulum. Strom described 5 new species, which he assigned to the genus *Skrjabinus*.

In the same paper, Strom (1940) proposed a revision of the genus *Lyperosomum* Looss, 1899, which now contained more than 50 species and subspecies. Three genera, *Lyperosomum* (*sensu stricto*), *Brachylecithum*, and *Corrigia*, were proposed for the reception of this assemblage of species. *Lyperosomum longicauda* (Rudolphi, 1809) was designated the type of the genus *Lyperosomum*, and the genus was restricted to those forms which showed (1) elongated bodies, the anterior end of which tapered more abruptly than did the posterior end; (2) subequal, muscular suckers, of which the acetabulum is the larger; (3) ceca ending in advance of the caudal extremity of the body; (4) testes oblique or symmetrical and close behind the acetabulum; (5) genital pore near the midline, at the posterior level of the pharynx; and (6) vitellaria consisting of numerous small follicles which extend from the zone of the testes to a level far short

From Denton
& Byrd, 1954

of the caudal extremity. Strom retained 12 species in the genus *Lyperosomum*.

In the second genus, *Brachylecithum*, Strom (1940) placed 25 species and 3 varieties formerly assigned to the genus *Lyperosomum*. The species *flum* (Dujardin, 1845) was designated as the type of the new genus. The generic group was briefly characterized as (1) possessing vitellaria composed of relatively few large follicles which occupied a small area just posterior to the ovary; (2) genital pore in the midline, ventral to the intestinal bifurcation; and (3) either one or two intestinal ceca which fail to reach the caudal end of the body. *Brachylecithum* (= *Lyperosomum*) *flum* was redescribed and figured. The species was represented as having branched intestinal ceca.

The third genus, *Corrigia*, proposed by Strom (1940) for species previously included in *Lyperosomum*, carried *Corrigia* (= *Lyperosomum*) *corrigia* (Braun, 1901) as the type. The group showed the following characters: (1) Body long and semitransparent; (2) weakly muscular suckers of approximately the same size; (3) two intestinal ceca which almost reach the caudal tip of the body; (4) genital pore ventral to or just posterior to the intestinal bifurcation; and (5) vitellaria consisting of numerous small follicles extending from the region of the ovary to a level behind the middle of the body. Four other species were assigned to the genus.

Travassos (1919) created the genus *Oswaldoia* for the reception of his species *oswaldoi* and transferred *Dicrocoelium skrjabinus* Solowjow, 1913, and *Lyperosomum direptum* Nicoll, 1914, to that genus. Since the erection of the genus several additional species have been described and assigned to *Oswaldoia* by various authors. Strom (1940) accepted Travassos' diagnosis of *Oswaldoia* and retained it as a valid genus for the species *O. oswaldoi* Travassos, 1919, *O. marquesi* (Travassos, 1922), *O. petiolatum* (Railliet, 1900), *O. direptum* (Nicoll, 1914), and *O. pawlowskyi* (Strom, 1928). Later, Travassos (1941b) erected the genus *Lutztrema* for the reception of those members of the genus *Lyperosomum* which possessed but a single cecum. In the genus, Travassos included the species formerly known as *Lyperosomum obliquum* Travassos, 1917, *L. transversum* Travassos, 1917, and *L. monenteron* Price and McIntosh, 1935, as well as three new species, *L. marinholutzi*, *L. verrucosum*, and *L. insigne*. On the basis of published figures alone Travassos provisionally includes several other species in his genus *Lutztrema*.

Being unaware of the paper published by Strom in 1940, Travassos (1944) elevated the subgenera *Concinnum* and *Conspicuum* of Bhalerao (1936) to generic rank. This writer, however, retained *Lubens* and *Skrjabinus* as subgenera of the genus *Eurytrema*. As defined by Travassos the genus *Conspicuum* is identical with the genus *Skrjabinus* as diagnosed by Strom. It is possible, therefore, to declare these

→ next page

Zonorchis Travassos, 1944, as a valid genus for the reception of certain species formerly included in the genera *Eurytrema* and *Platynosomum*, with the members of the genus *Zonorchis* differing from the remaining species of their respective generic groups in (1) the relatively large acetabulum in comparison to the size of the oral sucker; (2) the more forward position of the genital pore; and (3) the extent and rounded rather than dendritic follicles of the vitellaria.

two genera to be synonyms of each other. Since the name *Conspicuum* appears first in the original paper by Bhalerao, the proper designation of the genus is *Conspicuum*, and all species assigned to the genus *Skrjabinus* must be transferred to it.

Travassos (1944) recognized the unwieldiness of the assemblage of species assigned to the genus *Lyperosomum* Looss, 1899. Being unaware of the separation of the genus into three genera by Strom in 1940, Travassos proposed the genera *Olssoniella* and *Orthorchis* in addition to the genus *Lyperosomum* for the reception of this group of species. Travassos designated the species *longicauda* of Rudolphi, 1809, as the type of the genus *Lyperosomum*, and characterized the members of the genus in an almost identical way to that proposed by Strom. He further declared his genus *Oswaldoia* (1919) to be a direct synonym of *Lyperosomum* and transferred those species assigned to that genus to *Lyperosomum*. Sixteen species were listed as belonging to the genus.

For a second group of species formerly included in the genus *Lyperosomum*, Travassos (1944) erected the genus *Olssoniella*, with *O. olssoni* (Railliet, 1900) as the type. The genus *Olssoniella* is readily recognized as being identical with the genus *Brachylecithum* Strom, 1940. This identity is further evidenced by the fact that the species *filum*, the designated type of the genus *Brachylecithum*, is recognized as being congeneric with the species *olssoni* by its inclusion in the list of species given for the genus *Olssoniella* by Travassos. Travassos included 19 species in the genus *Olssoniella*. These species are hereby recognized as belonging to the genus *Brachylecithum*.

For the reception of a third group of species previously included in the genus *Lyperosomum*, Travassos (1944) erected the genus *Orthorchis*. *Orthorchis* (= *Lyperosomum*) *lari* (Travassos, 1917) was designated as the type, while six additional species were assigned to the genus. Among these species appears *corrigia* of Braun, 1901, the type species of the genus *Corrigia* as created by Strom, 1940. The quite similar diagnoses for the two genera (*Corrigia* and *Orthorchis*) together with the recognized congeneric relationship of the two type species renders the genus *Orthorchis* Travassos, 1944, a synonym of *Corrigia* Strom, 1940, and hence necessitates the transfer of the species included in the genus *Orthorchis* by Travassos to the genus *Corrigia*.

We have no hesitancy in restricting the genus *Ewrytrema* to those species now allocated to that genus by Bhalerao, 1936, Strom, 1940, and Travassos, 1944. As emended by Strom, 1940, we recognize the genus *Lubens* Travassos, 1920. The genera *Concinnum* Bhalerao, 1936, as emended by Travassos, 1944, and *Conspicuum* (= *Skrjabinus*) Bhalerao, 1936, as emended by Strom, 1940, and Travassos, 1944, constitute valid generic groups. Furthermore, we recognize the genus

DICROCOELIINAE RECORDED FROM MARSUPIAL HOSTS

So far as the author is aware, three species of *Zonorchis* have been described from American marsupials. Foster (1939) described *Platynosomum allentoshi* from the bile-ducts of *Philander laniger pallidus* from Panama, and believed his description to be the first record of the genus from a marsupial host. Denton (1944) found specimens which he considered to be identical with *P. allentoshi* in the gall-bladder of *Didelphis virginiana* from Texas, but transferred the species to the genus *Eurytrema*. Travassos (1944) erected the genus *Zonorchis*, separating it from *Platynosomum* largely on the basis of the greater development of the acetabulum relative to the oral sucker. He proposed the new combination *Z. allentoshi* (Foster, 1939) to include both *P. allentoshi* Foster, 1939, and *E. allentoshi* (Foster, 1939) as recorded by Denton (1944). Later, Travassos (1945) described *Z. goliath* from the bile-ducts of *D. marsupialis aurita* from Eugave, Brazil.

Wolfgang (1951) described a further new species, *Z. philanderi*, from the bile-ducts of *Philander trinitatus* from Trinidad.

Z. australiensis sp. nov., now described from the pancreatic ducts of *T. obesulus* in Australia, is the first record of a dicrocoeliid trematode from an Australian marsupial.

It appears that the most constant difference between *Z. allentoshi*, *Z. goliath* and *Z. philanderi* is in the size of the eggs. Even in this character, however, the greatest difference in length is only 16μ , and it is possible that the range may be affected by the varying techniques used in the examination of these parasites. Hence, also allowing for individual variation, this difference in egg size cannot be regarded as being very significant. In support, the following measurements were made of eggs from within the uterus of one specimen of *Z. australiensis*: $42\mu \times 28\mu$; $40\mu \times 30\mu$; $40\mu \times 25\mu$; $40\mu \times 20\mu$; $35\mu \times 25\mu$; $35\mu \times 20\mu$; $36\mu \times 20\mu$; $55\mu \times 18\mu$. In egg size *Z. australiensis* appears to be closest to *Z. goliath*.

In *Z. australiensis* there is a range in the sucker ratio in which all species of *Zonorchis* from marsupials may be included. The majority, however, lie nearer that given for *Z. allentoshi* and *Z. goliath*, although some specimens have a sucker ratio as small as, or even smaller than, that of *Z. philanderi*. The range in body length of *Z. australiensis* includes both that of *Z. philanderi* and *Z. allentoshi* and the smaller representatives of *Z. goliath*. The variations in the folding of the uterus above the acetabulum in *Z. australiensis* include all those described for the other species. In all the species the vitelline fields are all of about the same relative length.

TABLE

Comparing the species of *Zonorchis* recorded from marsupials

Species	Length, in mm.	Maximum body width, in mm.	Sucker ratio	Egg size	Host	Geographical distribution
<i>Z. australiensis</i> sp. nov.	2.0-11.5	1.00-2.25	1 : 1.3-2.0	$35-42\mu \times 18-30\mu$	<i>Thylacis obesulus</i>	Queensland
<i>Z. allentoshi</i> (Foster, 1939)	3.0-5.7	0.9-1.5	1 : 1.9-2.0	$33-36\mu \times 19-23\mu$	<i>Philander laniger pallidus</i>	Panama, R.P.
<i>Z. allentoshi</i> (recorded by Denton, 1944)	1.94-2.62	0.65-0.88	1 : 1.17-1.8	$30-36\mu \times 21-25\mu$	<i>Didelphis virginiana</i>	Houston, Texas
<i>Z. goliath</i> Travassos, 1945	9.5-13.8	2.5-3.7	1 : 1.68-1.72	$34-41\mu \times 22-26\mu$	<i>Didelphis marsupialis aurita</i>	Brazil
<i>Z. philanderi</i> Wolfgang, 1951	2.01-2.21	1.22-1.52	1 : 1.5-1.58	$26-33\mu \times 18-19\mu$	<i>Philander trinitatus</i>	Trinidad

It is evident, therefore, that morphologically all the species of *Zonorchis* described from American marsupials are so closely similar that it is difficult to differentiate them from one another. Since they are also all parasites of the biliary system of closely related hosts from the one geographical region, it seems probable that they all belong to the same species, viz., *Z. allentoshi*.

next page

Z. australiensis, although morphologically indistinguishable from the species of *Zonorchis* described from American marsupials, is here regarded as a new species, since biologically it appears to be quite distinct. It varies from the described species of *Zonorchis* from marsupial hosts in (a) its geographical distribution and (b) its constant position within the pancreatic ducts of its hosts. In support of this decision to create a new species, the following is quoted from Stunkard (1947, p. 465): 'It is appropriate to designate new forms by new names, even though they may be specifically identical with a previously described species. Some means of identifying specimens is necessary and it is easier and simpler to drop a name in synonymy than to distinguish between two or more species that have been confused under a single name.'

OTHER DICROCOELIIDAE FROM AUSTRALIAN HOSTS

Other Dicrocoeliidae recorded from Australian hosts are as follows: *Eurytrema crucifer* Nicoll, 1914, from *Delma fraseri* (Reptilia); *Lyperosomum harrisoni* Johnston, 1916, from *Ninox boobook* (Aves); *L. megastomum* Johnston, 1916, from *Sterna bergii* (Aves); *L. parvum* Johnston, 1916, from *Strepera versicolor* (Aves); *Platynosomum biliosum* Nicoll, 1914, from *Burhinus grallarius* (Aves) and from *Ibis molucca* (Aves); and *P. jercorus* Nicoll, 1914, from *B. grallarius* (Aves).

In the Australian literature there is only one record of *Dicrocoelium dendriticum* (Rudolphi, 1803); it was made by David (1900) from *Ovis aries* from New South Wales. If the parasite was correctly identified, it was doubtlessly introduced into Australia with its host (sheep). Since there are no further records, it does not appear to have become established.

DISCUSSION OF THE CLASSIFICATION OF SOME GENERA WITHIN THE DICROCOELIINAE

In 1907, Looss (1907a) erected the genus *Eurytrema*, with *E. pancreaticum* (Janson, 1889) as the type. In 1936 Bhalerao divided the numerous species then described as *Eurytrema* into five subgenera, *Concinnum*, *Conspicuum*, *Lubens*, *Pancreaticum* and *Skrjabinus*. Looss (1907b) erected the genus *Platynosomum*, with *P. semifuscum* sp. nov. as the type. In his discussion of the forms to be included in *Platynosomum* Looss was not definite, and he recognized the obvious grading between the various members of the Dicrocoeliinae.

In the ensuing years the confusion in this ill-defined group has increased. New species have been allocated to either *Eurytrema* or *Platynosomum*, according mainly to the inclination of the worker. McIntosh (1939), in describing a new species which he named *E. komareki*, noted that the worms had features which were such that they could have been classified as either *Eurytrema* or *Platynosomum*. He stated that 'according to many recent writers, *Platynosomum* is not sufficiently different from *Eurytrema* to be regarded as a distinct genus.'

Travassos (1944), in his monograph on the Dicrocoeliidae, included in the subfamily Dicrocoeliinae Looss, 1899, 14 genera, among which were both *Eurytrema* Looss, 1907, and *Platynosomum* Looss, 1907. Travassos also erected seven new genera in the subfamily, among which was *Zonorchis*. Denton (1944), making a further record of *E. allentoshi*, transferred the species from *Platynosomum* to *Eurytrema*, on the grounds that 'most of the characters exhibited by our material are typical of that genus.' He further stated that 'An extensive study of the species assigned to either the genus *Eurytrema* or *Platynosomum* Looss, 1907, has convinced the writer that not a single specific character or combination of characters exists by which this group can be segregated into 2 genera. Thus the genus *Platynosomum* must be regarded as a synonym of *Eurytrema*.' Stunkard (1947), describing a provisional new species, *Eurytrema vulpis*, stated that 'It is, however, virtually impossible to make a satisfactory differential diagnosis of this and many of the other species assigned to the genus *Eurytrema*. Only experimental work can determine the specific identity of specimens included in the genus.' He then reviewed the literature on the group, stating that 'there appear to be sound reasons' for suppressing the genera *Platynosomum*, *Concinnum*, and possibly others, as identical with *Eurytrema*.

Sanders, 1958.

Continued

Skrjabin and Evranova (1952), in their revision, have closely followed the work of Travassos (1944), but have erected even more genera. Dollfus (1954) has attempted to sort out some of the confusion between these newly erected genera within the Dicrocoeliinae, and has indicated clearly many of the difficulties within the group. The following extract from his work (Dollfus, 1954, p. 586; translated from the French) is quoted in its entirety, for nowhere else in the literature has there been given a better picture of the confusion and lack of definition within the group.

'In 1923, at the time of my work on the variability of the anatomical characters of the genera of the Dicrocoeliidae and the extent of individual variations, the Dicrocoeliinae parasites of homeothermic animals still numbered only 10 genera, as admitted by Travassos (1919). In the monograph of Travassos (1944), there are 19 genera and five subgenera in the Dicrocoeliinae of homeothermic animals. Now, in the recent monograph of Skrjabin and Evranova (1952) there are for them 30 genera.

'It is particularly necessary that all these genera should be well defined; in many of them the supposedly distinguishing characters overlap those of other genera to such a point that one can doubt their validity. *If defining the genera is difficult, defining the species is no less so,** and, if one wishes critically to define the specific characters, it is necessary to consider above all the average characters; in other words, it is necessary to examine a great number of conspecific individuals from the same source to define the characters of these species, choosing the features common to the greatest number of individuals. It often happens that in the same collection of conspecific specimens there are some of which the characters are sufficiently different from those that are accepted as characteristic of the species that it would have been necessary to assign them to other genera if they had been examined separately.

'Some species anatomically very close are often placed in different genera, and, according to each author, the same species is placed sometimes in one genus, sometimes in another; it is a question of personal opinion.'

There appears to be a series of features, used in conjunction with each other, on which the division into the numerous genera of the Dicrocoeliinae has been made. The major of these are as follows:

- (a) Body width relative to body length, i.e., long, narrow form or more leaf-like form.
- (b) Relative sizes of the oral sucker and acetabulum, i.e., whether they are equal or subequal.
- (c) Position of the testes, i.e., in tandem, or in parallel with each other. Their position relative to the acetabulum is also important.
- (d) Position and pattern of the vitellaria, and whether the vitelline fields are single or paired.

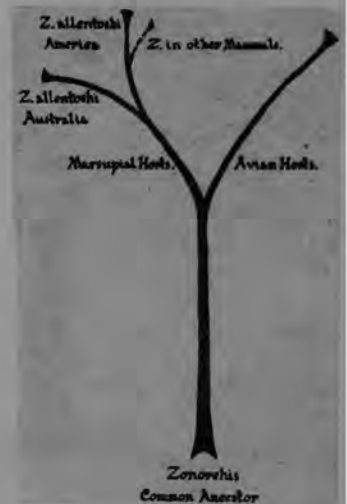
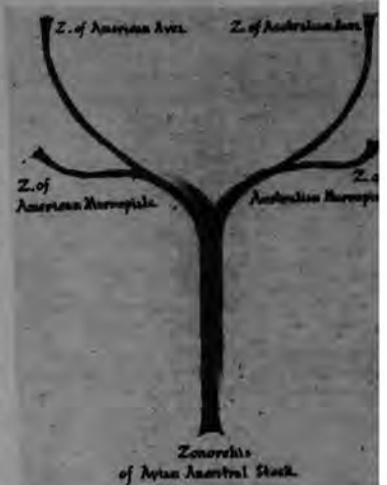
This outline of the literature is not intended as a comprehensive list of publications on the Dicrocoeliinae. There have been many other papers which have added further species to the various genera. This brief survey is, however, meant to indicate, through selection of the more important works, the present state of confusion that exists within the group and the manner in which this confusion has arisen.

It seems inevitable that a complete revision of the entire Dicrocoeliinae must ultimately be attempted. Wide surveys, with ample material, will be necessary in order to determine the degree of variation within each species. Cytological techniques, with the use of chromosome counts, may prove to be of value. Life-history studies may have to be completed before each group can be properly defined. Until such time as such a revision is made, however, it seems advisable to retain, in general, the classification of Travassos (1944), as modified by Dollfus (1954).

Platynosomum and the closely allied genera, including *Zonorchis*, may well be shown to fall within the genus *Eurytrema*.

PHYLOGENETIC RELATIONSHIPS

If parasite relationships reflect something of host relationships, which is not unreasonable, some phylogenetic relationships may therefore perhaps be postulated through the species of *Zonorchis*. It would appear that an ancestral form which gave rise to both Aves and Marsupialia may have harboured the ancestor of *Zonorchis*. Through this form, there could have evolved the lines of *Zonorchis* parasites which have invaded and persisted in avian and marsupial hosts. The present end-points, then, would be the species of *Zonorchis* found in birds and marsupials. If *Z. komareki* from the white-footed mouse is found to be a valid species, presumably it would have evolved from the stock of *Z. allentoshi*.



Within the Marsupialia, it would seem that the primitive didelphoid stock may have become infested with the ancestral *Zonorchis* which gave rise to the *Zonorchis* of the Didelphoidea. The Perameloidea could be supposed to have arisen from the early didelphoid stock, thus acquiring its infestation of *Zonorchis*, which it has retained even though found in a remote geographical area (fig. B). This supports the suggestions made by Simpson (1945), but does not appear to be in accord with Cameron (1952), who, in discussing the relationships of the American opossums and Australian marsupials, stated that 'The entozoa of the opossums and the Australian marsupials are quite different.'

On the other hand, fascinating as this hypothesis may be, it must not be overlooked that *Zonorchis* belongs to a group of trematodes which specifically, and even generically, are often difficult to determine, and in which host-specificity may not be highly developed. All species of *Zonorchis* so closely resemble one another morphologically that it seems possible that the American marsupial hosts may have derived their infestations through *Zonorchis* then parasitic in American birds. At the same time, Australian marsupials may equally well have derived their infestations through a *Zonorchis* then parasitic in Australian birds. In that case, the species of *Zonorchis* now infesting both American and Australian marsupials would have evolved by a process of parallel evolution (fig. B).

A study of other parasites from marsupial hosts, particularly those which exhibit a greater degree of host-specificity, may show that there is reflected in their relationships an evolutionary picture similar to that now presented. This, then, would lend support to the hypothesis now suggested. Experimental evidence on the specificity of these trematodes may also help to clarify the relationships of the species of *Zonorchis* from the various host groups, i.e., the avian and marsupial hosts of America and Australia.

SUMMARY

1. *Zonorchis australiensis* sp. nov. (Dicrocoeliinae) is described from the pancreatic ducts of the short-nosed bandicoot, *Thylacis obesulus* (Shaw and Nodder, 1797), from Brisbane and Gympie, Queensland, and from the long-nosed bandicoot, *Perameles nasuta* Geoffroy, 1804), from Mount Glorious, south Queensland.
2. Previous records of dicrocoeliid parasites of marsupial hosts are listed and their relationships are discussed. *Z. goliath* Travassos, 1945, and *Z. philanderi* Wolfgang, 1951, are regarded as synonyms of *Z. allentoshi* (Foster, 1939).
3. Records of other species of *Zonorchis* are listed, and the history of the confusion in the classification of some genera within the Dicrocoeliinae is outlined.
4. The significance is discussed of parasite relationships in respect to host relationships in the evolution of *Zonorchis* within avian and marsupial hosts.

Sanders, 1958
Continued

II. Superfamilia Dicrocoelioidea FAUST, 1929; ODENING, 1964 char. emend.

A. Definition der Überfamilie

Plagiorchiata mit plagiorchioidem Ansatzmodus des Exkretionsgefäßsystems (d. h. die Ansatzstücke münden terminal vorn in die Exkretionsblase), mit I-förmiger Exkretionsblase; Protonephridienformel^① von der reifen Cercarie an bis zum Adultus unverändert $2[(2 + 2 + 2) + (2 + 2 + 2)] = 24$; Ovarium stets hinter den beiden Testes; echter Cirrusbeutel stets vorhanden und immer vor dem Bauchsaugnapf oder weiter vorn gelegen; Genitalporus stets in unmittelbarer Nähe der Darmgabelung oder weiter vorn; Cercarien zu den Typen 'Cercariae vitrinae' oder 'Dicromicrocercariae' gehörig; 1. Zwischenwirte Landpulmonaten, was rein terrestrische Zyklen zur Folge hat; 2. Zwischenwirte — soweit bekannt — Arthropoden oder (paratenische Wirte?) poikilotherme Wirbeltiere (Reptilien); überwiegend Parasiten der Gallengänge der Leber oder der Gallenblase (selten anderer Organe, z. B. des Darmtrakts oder des Pankreas) von Säugetieren, Vögeln und Reptilien. Typische und einzige Familie: Dicrocoeliidae ODHNER, 1910.

B. Revidierte Einteilung der Dicrocoeliidae ODHNER, 1910

(Anmerkungen folgen im Anschluß an die Aufstellung)

Dictocoeliinae LOOSS, 1899; char. emend.¹

Dictocoeliini YAMAGUTI, 1958; char. emend.²

Dicrocoelium DUJARDIN, 1845

Metadelphis TRAVASSOS, 1944

Oswaldoia TRAVASSOS, 1919

(*Oswaldoia*) TRAVASSOS, 1919

(*Dicrocoelioides*) DOLLFUS, 1954

Lyperosomum LOOSS, 1899

Corrigia ŠTROM, 1940

(*Corrigia*) ŠTROM, 1940

(*Skrjabinosomum*) EVRANOVA, 1944

Brachylecithini YAMAGUTI, 1958; char. emend.³

Brachylecithum ŠTROM, 1940

Brachydistomum TRAVASSOS, 1944

(*Brachydistomum*) TRAVASSOS, 1944

(*Olsoniella*) TRAVASSOS, 1944

Lutztrema TRAVASSOS, 1941

Athesmini YAMAGUTI, 1958

Athesmia LOOSS, 1899

Pseudathesmia TRAVASSOS, 1942

Unilaterilecithum OŠMARIN in SKRJABIN, 1952

Controrchiini YAMAGUTI, 1958

Controrchis PRICE, 1928

Proacetabulorchiinae n. subfam.⁴

Proacetabulorchis GOGATE, 1940

Leipertrematinae YAMAGUTI, 1958; char. emend.⁵

Leipertrematini n. trib.⁶

Leipertrema SANDOSHAM, 1951

Brodinia GEDOELST, 1913

Eurytrematini YAMAGUTI, 1958; char. emend.⁷

Eurytrema LOOSS, 1907

Concinnum BHALERAO, 1936

Dictyonograptus TRAVASSOS, 1919

Platynosomum LOOSS, 1907

Paradistomum KOSSACK, 1910

Paradistomoides TRAVASSOS, 1944

Conspicui n. trib.⁸

Conspicuum BHALERAO, 1936

Canaania TRAVASSOS, 1944

Lubens TRAVASSOS, 1919

Zonorchis TRAVASSOS, 1944 (? = *Skrjabinus* BHALERAO, 1936)

Platynotrematini YAMAGUTI, 1958; char. emend.⁹

Platynotrema NICOLL, 1915 (= *Praeorchitrema* OŠMARIN in SKRJABIN, 1952)

Euparadistomum TUBANGUI, 1931

Infidini YAMAGUTI, 1958

Infidum TRAVASSOS, 1916

Stromitrematinae YAMAGUTI, 1958

Stromitrema SKRJABIN et EVRANOVA, 1944

Pancreatrema OŠMARIN in SKRJABIN, 1952

Anmerkungen:

¹) Diagnose s. S. 155.

²) Diagnose s. S. 155.

³) Diagnose s. S. 157.

⁴) Diagnose nicht identisch mit derjenigen der Tribus Proacetabulorchiini YAMAGUTI, 1958, da dort *Platynotrema dogieli* (BELOPOL'SKAJA et BYCHOVSKAJA-PAVLOVSKAJA, 1953) mit in die Gattung *Proacetabulorchis* einbezogen wurde (vgl. hierzu BYCHOVSKAJA-PAVLOVSKAJA 1962). Diagnose identisch mit derjenigen des Genus *Proacetabulorchis* sensu SKRJABIN et EVRANOVA (1952).

⁵) Diagnose s. S. 160.

⁶) Diagnose: Leipertrematinae mit kurzen, höchstens bis zur Körpermitte reichenden Darmschenkeln und hinter dem Bauchsaugnapf gelegenen Testes; Parasiten von Säugetieren (Primaten); typische Gattung: *Leipertrema*.

⁷) Diagnose s. S. 161.

⁸) Diagnose s. S. 165.

⁹) Diagnose: Leipertrematinae mit langen, bis in den Hinterkörper reichenden Darmschenkeln und vor dem Bauchsaugnapf gelegenen Testes; Parasiten von Reptilien, Vögeln und Säugetieren; typische Gattung: *Platynotrema*.

① Für *Zonorchis alveyi* (MARTIN et GEE, 1949) wurde von den Autoren der Art die abweichende Formel $2[(1 + 1 + 1 + 1) + (1 + 1 + 1 + 1)]$ angegeben. Dieses Ergebnis ist jedoch nach der beigegebenen Abbildung als $2[(2 + 1 + 1) + (1 + 1 + 2)]$ zu deuten und scheint mir im übrigen einer Überprüfung wert. Die von den Autoren der Art angegebene Formel wurde von YAMAGUTI (1958) infolge eines Druckfehlers mit $2[(1 + 1 + 1 + 1) + (1 + 1 + 1 + 4)]$ wiedergegeben, was in dieser falschen Form von ODENING (1959) übernommen worden war.

C. Bestimmungsschlüssel zu den Unterfamilien, Tribus, Gattungen und Untergattungen der Dicrocoeliidae

- 1 (62) Bauchsaugnapf vorhanden.
- 2 (3) Beide Testes geradlinig hintereinander vor dem Bauchsaugnapf gelegen:
Proacetabulorchinae n. subfam.
Proacetabulorchis GOGATE, 1940
- 3 (4) Testes anders gelegen.
- 4 (33) Testes hintereinander (Tandem-Position) oder diagonal zueinander gelegen:
Dicrocoeliinae LOOSS, 1899; char. emend.
- 5 (27) Dotterstöcke an beiden Körperseiten liegend oder, wenn nicht getrennt erscheinend, annähernd symmetrisch verteilt.
- 6 (32) Beide Testes hinter dem Bauchsaugnapf gelegen.
- 7 (20) Dotterfollikel klein, Dotterbereich insgesamt etwa ein Drittel oder weniger der Körperbreite einnehmend:
Dicrocoeliini YAMAGUTI, 1959; char. emend.
- 8 (11) Körper lanzettförmig, in der Mitte verbreitert, Saugnäpfe annähernd gleich groß, Genitalporus bifurcal, postbifurcal oder geringfügig praebifurcal, Cirrusbeutel überwiegend postbifurcal gelegen.
- 9 (10) Testes kurz hinter dem Bauchsaugnapf, Ovarium kurz hinter den Testes gelegen:
Dicrocoelium DUJARDIN, 1845
- 10 (9) Testes durch stark entwickelte Uterusschlingen vom Bauchsaugnapf und vom Ovarium getrennt:
Metadelphis TRAVASSOS, 1944
- 11 (8) Eine Kombination der genannten Merkmale trifft nicht zu.
- 12 (17) Körper lanzettförmig bis sehr langgestreckt, Bauchsaugnapf größer als Mundsaugnapf, Dotterstöcke in der Testes-Region kurz vor dem Ovarium beginnend, Genitalporus praebifurcal bis pharyngeal.
- 13 (14) Körper langgestreckt, Testes und Ovarium fast in einer Linie hintereinander gelegen:
Lyperosomum LOOSS, 1899
- 14 (13) Körper langgestreckt oder kürzer lanzettförmig, Testes diagonal zueinander gelegen:
Oswaldoia TRAVASSOS, 1919
- 15 (16) Körper langgestreckt lanzettförmig, Gonaden im ersten Körperdrittel gelegen, größte Breite meist im Vorderkörper:
(Oswaldoia) TRAVASSOS, 1919
- 16 (15) Körper kürzer lanzettförmig, Gonaden im zweiten Körperdrittel oder -viertel gelegen, größte Breite meist im mittleren Körperbereich:
(Dicrocoelioides) DOLLFUS, 1954
- 17 (12) Körper sehr langgestreckt, Dotterstöcke erst in der ovarialen oder post-ovarialen Region beginnend, Testes und Ovarium in einer Linie hintereinander gelegen; Genitalporus bifurcal, postbifurcal oder geringfügig praebifurcal gelegen:
Corrigia ŠTROM, 1940
- 18 (19) Saugnäpfe annähernd gleich groß:
(Corrigia) ŠTROM, 1940
- 19 (18) Bauchsaugnapf größer als Mundsaugnapf:
(Skrjabinosomum) EVRANOVA, 1944
- 20 (7) Dotterfollikel groß, Dotterbereich insgesamt fast die Hälfte oder mehr der Körperbreite einnehmend:
Brachylecithini YAMAGUTI, 1958; char. emend.
- 21 (22) Es ist nur ein einziger Darmschenkel vorhanden:
Lutztrema TRAVASSOS, 1941
- 22 (21) Der Darm gabelt sich in zwei Darmschenkel.
- 23 (26) Körper länglich-lanzettförmig, größte Breite im Vorderkörper, Bauchsaugnapf mehr als doppelt so groß wie Mundsaugnapf:
Brachydistomum TRAVASSOS, 1944
- 24 (25) Testes und Ovarium geradlinig median hintereinander gelegen:
(Brachydistomum) TRAVASSOS, 1944
- 25 (24) Testes überwiegend diagonal gelegen, Testes und Ovarium durchschnittlich nicht median in einer Linie:
(Olssoniella) TRAVASSOS, 1944
- 26 (23) Körper langgestreckt bis fadenförmig, Saugnäpfe meist annähernd von gleicher Größe oder selten Bauchsaugnapf höchstens doppelt so groß wie Mundsaugnapf:
Brachylecithum ŠTROM, 1940
- 27 (5) Dotterstock nur auf einer Körperseite entwickelt:
Athesmini YAMAGUTI, 1958
- 28 (29) Dotterstock auf das hintere Körperdrittel beschränkt, Ränder des Hinterkörpers mit Einbuchtungen:
Unilaterilecithum OŠMARIN in SKRJABIN, 1952
- 29 (28) Dotterstock im Bereich des 3. Körperviertels oder des mittleren Körperdrittels, Ränder des Hinterkörpers ohne Einbuchtungen.
- 30 (31) Körper langgestreckt, Bauchsaugnapf an der Grenze des ersten Körperfünftels oder davor:
Athesmia LOOSS, 1899
- 31 (30) Körper lanzettförmig, Bauchsaugnapf an der Grenze des ersten Körperdrittels oder wenig davor:
Pseudathesmia TRAVASSOS, 1942
- 32 (6) Vorderer Testis vor, hinterer Testis hinter dem Bauchsaugnapf gelegen:
Controrchini YAMAGUTI, 1958
Controrchis PRICE, 1928
- 33 (4) Testes stets parallel nebeneinander liegend: Leiptrematinae (Yamaguti, 1958) char. emend.
- 34 (35) Genitalporus stark submedian bis lateral verschoben, etwa in der Mitte zwischen Medianlinie und Körperperrand gelegen:
Infidini YAMAGUTI, 1958
Infidum TRAVASSOS, 1916
- 35 (34) Genitalporus median oder geringfügig submedian verschoben gelegen.
- 36 (39) Testes vor dem Bauchsaugnapf gelegen:
Platynotrematini YAMAGUTI, 1958; char. emend.

57 (38) Körper gedrunen lanzettförmig oder spindelförmig bis schlank elliptisch, Dotterstöcke weniger als die Hälfte der Körperlänge einnehmend; Parasiten von Vögeln

Platynotrema NICOLL, 1915

58 (37) Körper rundlich bis dick elliptisch, Dotterstöcke die Hälfte der Körperlänge oder mehr einnehmend; Parasiten von Reptilien und Säugetieren:

Euparadistomum TUBANGUI, 1931

59 (36) Testes neben oder hinter dem Bauchsaugnapf gelegen.

60 (43) Darmschenkel kurz, höchstens bis zur Körpermitte reichend:

Leipertrematini n. trib.

61 (42) Darmschenkel bis zur Körpermitte reichend, mittlerer Körperbereich an den Seiten gesägt, Dotterstöcke extracaecal:

Brodinia GEDOELST, 1913

62 (41) Darmschenkel enden vor der Körpermitte, Körperränder nicht gesägt, Dotterstöcke hinter den Darmenden:

Leipertrema SANDOSHAM, 1951

63 (40) Darmschenkel lang, über die Körpermitte hinaus nach hinten reichend.

64 (55) Genitalporus bifurcal, postbifurcal oder geringfügig praebifurcal, Cirrusbeutel überwiegend postbifurcal gelegen:

Eurytrematini YAMAGUTI, 1958; char. emend.

65 (48) Darmschenkel meist ebenso breit wie Bauchsaugnapf oder breiter; Parasiten von Reptilien.

66 (47) Körper mehr oder weniger gedrunen lanzettförmig, elliptisch oder spindelförmig, Dotterstöcke aus wenigen großen Follikeln zusammengesetzt auf einen kurzen Bereich (weniger als ein Drittel der Körperlänge) Testes beschränkt:

67 (46) Körper gedrunen lanzettförmig, elliptisch, eiförmig oder breit spindelförmig, Dotterstöcke aus vielen meist kleineren Follikeln bestehend und etwa ein Drittel oder mehr der Körperlänge einnehmend:

Paradistomoides TRAVASSOS, 1944

68 (45) Darmschenkelbreite meist wesentlich geringer als Bauchsaugnapf-Durchmesser; Parasiten von Vögeln und Säugetieren.

69 (52) Bauchsaugnapf an der Grenze des ersten Körperdrittels oder dahinter, Körper rundlich-elliptisch bis gedrunen lanzett- oder spindelförmig.

70 (51) Genitalporus postbifurcal oder bifurcal, Dotterstöcke aus vielen kleinen Follikeln bestehend, die in Form seitlicher Reihen angeordnet sind:

Eurytrema LOOSS, 1907

71 (50) Genitalporus bifurcal oder praebifurcal, Dotterstöcke aus wenigen größeren Follikeln bestehend, die in seitlichen Haufen angeordnet sind:

Concinnum BHALERAO, 1936

72 (49) Bauchsaugnapf stets vor der Grenze des ersten Körperdrittels, meist an der Grenze des 1. Körperviertels, Körper lanzett- bis spindelförmig (nicht gedrunen, eher länglich).

73 (54) Dotterstöcke seitlich vom Bereich des Oesophagus bis in das hintere Körperdrittel reichend:

Dictyonograptus TRAVASSOS, 1919

74 (53) Dotterstöcke vom Bereich der Testes an nicht mehr als ein Drittel der Körperlänge einnehmend:

Platynosomum LOOSS, 1907

75 (44) Genitalporus praebifurcal bis pharyngeal, Cirrusbeutel überwiegend praebifurcal gelegen:

Conspicui n. trib.

76 (57) Dotterstöcke den Bauchsaugnapf vorn überschreitend (Körper gedrunen spindelförmig, Bauchsaugnapf größer als Mundsaugnapf und den Bereich des 2. Körperviertels einnehmend):

Canaama TRAVASSOS, 1944

77 (56) Dotterstöcke vorn nicht über den Bauchsaugnapf hinausreichend, Körper lanzettförmig.

78 (61) Bauchsaugnapf im Bereich des ersten Körperviertels oder -drittels gelegen.

79 (60) Bauchsaugnapf größer als Mundsaugnapf (Durchmesser mindestens wie 3:2), im Bereich des ersten Körperviertels oder -drittels gelegen, größte Körperbreite meist in der Körpermitte oder davor:

Zonorchis TRAVASSOS, 1944

(? = *Skrjabinus* BHALERAO, 1936)

80 (59) Saugnapfe annähernd gleich groß, Bauchsaugnapf völlig im Bereich des sich verzweigenden ersten Körperviertels gelegen, Körper breit und hinten breit abgerundet, größte Breite meist in der Körpermitte oder dahinter:

Labens TRAVASSOS, 1919

81 (58) Bauchsaugnapf im Bereich des 2. Körperviertels:

Conspicuum BHALERAO, 1936

62 (1) Bauchsaugnapf fehlt:

Stromitrematinae YAMAGUTI, 1958

63 (64) Dotterstöcke in der Region des Ovariums im mittleren Körperabschnitt, Ovarium vielfach gelappt; Parasiten der Gallenblase von Vögeln:

Stromitrema SKRJABIN et EVRANOVA, 1944

64 (63) Dotterstöcke hinter der Körpermitte, hinter dem Bereich des glattrandigen Ovariums; Parasiten des Pankreas von Vögeln:

Pancreatrema OSMARIN in SKRJABIN, 1952

FROM ODENING, 1964

Dicrocoeliinae

KEY TO GENERA OF DICROCOELIINAE

(After Luhe, 1909)

I. Vitellaria paired, symmetrical

1. Body much widened. Testes symmetrical, relatively far separated from one another..... Eurytrema

2. Body more or less elongate.

a. Body lance~~l~~ shaped, much flattened

(1) greatest body width anterior to middle, at level of gonads. Testes symmetrical close to one another..... Platynosomum

(2) greatest body width behind middle. Testes obliquely behind one another ..

Dicrocoelium

b. Body very strongly elongated, not evidently wider than thick. Testes completely behind one another..... Lyperosomum

II. Vitellaria unpaired, on one side only. Body flat and much elongated..... Athesmia.

omitted: Stygonimus
Oswaldoia

TABLE 1.—Distribution of dicrocoeliids in North American birds

HOST	TREMATODE	LOCALITY	REFERENCE
Accipitridae:			
<i>Buteo lineatus</i>	<i>Brachylecithum americanum</i> .	Georgia.....	This paper.
<i>Buteo platypterus</i>	<i>Platynosomum illiciens</i>	Ohio; Wisconsin.....	Denton and Rausch, 1949.
Tetraonidae:			
<i>Pedioecetes phasianellus campestris</i> .	<i>Athesmia wehri</i>	Montana.....	McIntosh, 1937.
<i>Bonasa umbellus</i>	<i>Lutztrema monenteron</i> (?)..	Minnesota.....	Ishii, 1942.
Gruidae:			
<i>Grus canadensis tabida</i> ..	<i>Brachylecithum gruis</i>	Texas.....	This paper.
Rallidae:			
<i>Gallinula chloropus cachinnans</i> .	<i>Athesmia heterolecithodes</i> ..	Tennessee.....	This paper.
Strigidae:			
<i>Bubo virginianus</i>	<i>Brachylecithum moorei</i>	Texas (?).....	This paper.
Picidae:			
<i>Melanerpes erythrocephalus</i> .	<i>Zonorchis petiolatum</i>	Mississippi.....	This paper.
Tyrannidae:			
<i>Tyrannus tyrannus</i>	<i>Lutztrema monenteron</i> (?)..	Minnesota.....	Ishii, 1942.
Corvidae:			
	<i>Lyperosomum oswaldoi</i>	Texas.....	This paper.
	<i>Lutztrema microstomum</i>	North Carolina; Georgia; Texas.	This paper.
<i>Cyanocitta cristata</i>	<i>Brachylecithum americanum</i> .	Georgia.....	Denton, 1945.
	<i>Brachylecithum stunkardi</i> ..	Virginia; Texas.....	This paper.
	<i>Zonorchis petiolatum</i>	Texas.....	This paper.
<i>Corvus brachyrhynchos</i> ..	<i>Brachylecithum americanum</i> .	Georgia.....	Denton, 1945.
	<i>Conspicuum macrorchis</i>	Texas.....	This paper.
Mimidae:			
<i>Mimus polyglottos</i>	<i>Lutztrema monenteron</i>	Georgia; Texas.....	This paper.
	<i>Lyperosomum oswaldoi</i>	Georgia; Mississippi; Texas.	This paper.
<i>Toxostoma rufum</i>	<i>Lutztrema monenteron</i>	Virginia.....	This paper.
	<i>Brachylecithum exochocotyle</i>	Georgia.....	This paper.
Turdidae:			
		Virginia; Washington, D. C.; Quebec, Canada.	Price and McIntosh, 1935.
<i>Turdus migratorius</i>	<i>Lutztrema monenteron</i>	Virginia; North Carolina; Georgia; Ohio; Tennessee; Texas.	This paper.
<i>Sialia s. sialis</i>	<i>Lutztrema monenteron</i>	Virginia.....	Price and McIntosh, 1935.
Parulidae:			
<i>Seiurus aurocapillus</i>	<i>Brachylecithum seiuricum</i> ..	Virginia.....	This paper.
<i>Wilsonia canadensis</i>	<i>Brachylecithum tuberculatum</i> .	Virginia.....	This paper.
Icteridae:			
<i>Sturnella magna argutula</i> .	<i>Brachylecithum americanum</i> .	Texas.....	Denton, 1945.
	<i>Conspicuum icteridorum</i>	Texas; Georgia.....	This paper.
<i>Euphagus carolinus</i>	<i>Conspicuum icteridorum</i>	Texas.....	This paper.
<i>Cassidix mexicanus major</i> .	<i>Conspicuum icteridorum</i>	Texas.....	This paper.
<i>Cassidix mexicanus prosopidicola</i> .	<i>Brachylecithum americanum</i> .	Texas.....	Denton, 1945.
	<i>Lubens lubens</i>	Texas.....	This paper.
	<i>Conspicuum icteridorum</i>	Texas.....	This paper.
<i>Quiscalus quiscula quiscula</i> .	<i>Conspicuum icteridorum</i>	Georgia.....	This paper.
<i>Quiscalus quiscula aeneus</i> .	<i>Brachylecithum americanum</i> .	Tennessee; Texas.....	Denton, 1945.
	<i>Conspicuum icteridorum</i>	Michigan; Tennessee; Texas.	This paper.
Thraupidae:			
<i>Piranga olivacea</i>	<i>Lubens lubens</i>	Virginia.....	This paper.
Fringillidae:			
<i>Richmondia cardinalis</i> .	<i>Zonorchis petiolatum</i>	Texas.....	This paper.
<i>Hedymeles ludovicianus</i> .	<i>Concinnum ludoviciana</i>	Nebraska.....	Petri, 1942.
	<i>Zonorchis petiolatum</i>	Nebraska.....	This paper.
	<i>Brachylecithum rarum</i>	Virginia; North Carolina.	This paper.
<i>Pipilo erythrophthalmus</i> .	<i>Brachylecithum nanum</i>	Virginia; North Carolina.	This paper.
	<i>Brachylecithum delicatum</i> ..	North Carolina.....	This paper.
	<i>Zonorchis alveyi</i>	Virginia; North Carolina; Georgia.	This paper.
<i>Junco hyemalis</i>	<i>Zonorchis alveyi</i>	Indiana.....	Martin and Gee, 1949.
<i>Zonotrichia leucophrys</i> .	<i>Zonorchis alveyi</i>	Georgia.....	This paper.
<i>Zonotrichia albicollis</i>	<i>Brachylecithum nanum</i>	Georgia; Texas.....	This paper.
	<i>Zonorchis alveyi</i>	Texas.....	This paper.
<i>Melospiza georgiana</i>	<i>Zonorchis alveyi</i>	Georgia.....	This paper.
<i>Melospiza melodia</i>	<i>Zonorchis alveyi</i>	Georgia.....	This paper.

From:
Denton & Byrd,
1951

Genera of Dicrocoeliinae (after Denton)

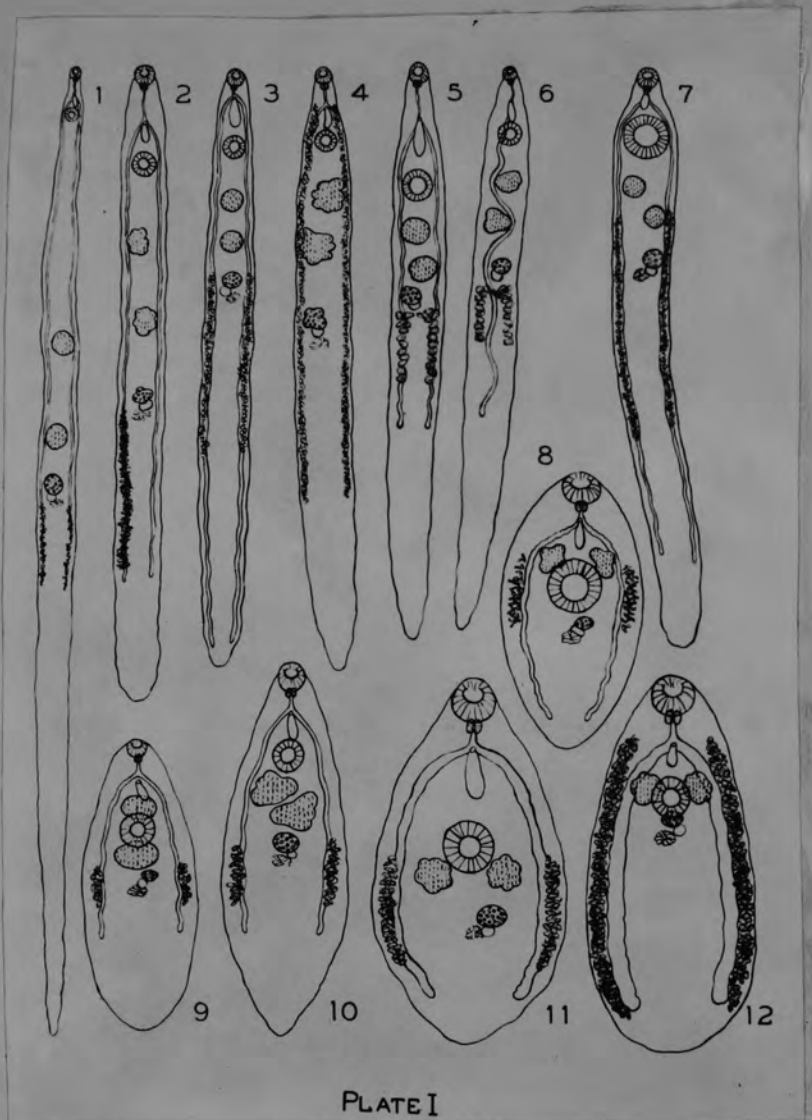


PLATE I

- Fig. 1. *Dolichotrema* Denton
2. *Athesmia* Looss, 1899
3. *Lyperosomum* Looss, 1899
4. *Lyperotrema* Travassos, 1919
5. *Botrydolecithus* Denton
6. *Monenteron* Denton
7. *Oswaldoia* Travassos, 1919
8. *Platynotrema* Nicoll, 1914
9. *Controrchis* Price, 1929
10. *Dicrocoelium* Dujardin, 1845
11. *Eurytrema* Looss, 1907
12. *Dictyonograptus* Travassos, 1919

Dicrocoeliidae

Key to nine species of *Dicrocoelium* as given by Macy
Journal of Parasitology 1931, vol.18:32

1. Ovary approximately same size as testes.....8
Ovary considerably smaller than testes.....2
2. Anterior larger than ventral sucker, as 3:2.....7
Ant. sucker never larger and usually smaller than ventral.....3
3. Intestinal ceca extending much beyond vitellaria.....5
Intestinal ceca not extending posterior to vitellaria.....4
4. Field of vitellaria extending about $\frac{1}{4}$ body length,
follicles numerous.....*D. albicole* (Rud)
Field of vitellaria extending not over $\frac{1}{6}$ body length,
follicles few, usually 10-12 or less.....*D. rileyi* Macy
5. Testes tandem. Genital ducts form median series. Field
of vitellaria entirely entad to ceca.....*D. hospes* Looss
Testes oblique or opposite. Genital ducts not in median
series. Field of vitellaria not entirely
entad to ceca.....6.....*D. macaci* Kobayashi
6. Testes opposite or nearly so.....
Testes markedly oblique, approaching tandem condition
in some specimens.....*D. dendriticum* (Rud.)
7. Seminal receptacle absent (?).....*D. macrostomum* Odhner
Seminal receptacle present.....*D. colobosicola* Sandground
8. Testes nearly opposite.....*D. panduriforme* Railliet
Testes markedly oblique.....9
9. The three genital organs on a line forming an angle of
45 with the longitudinal body axis. Field of vitellaria
very wide.....*D. kalmikensis* Skrjabin & Isaitschi
koff
Ovary median; testes on either side of the longitudinal body
axis. Field of vitellaria narrow.....
D. rossicum Skrjabin & Isaitschikoff

Dicrocoeliidae

Genus Dicrocoelium Dujardin, 1845

Diag.: Body lance-like, widest at the center of the body, posterior more or less tapered. Cuticula smooth. Ventral sucker better developed than oral sucker. Esophagus of medium length, ceca, long and narrow. Testes marginal, lying diagonally from each other, immediately behind the ventral sucker. Cirrus sac almost completely before the ventral sucker, posterior to which lies the more or less coiled seminal vesicle, the pars prostatica and a proportionately long narrow cirrus pre-vesicular. Ovary medial, smaller than the testes, post-testicular. Uterine coils transversal, and very numerous. Vitellaria small, at the sides, above and lateral to the intestinal ceca.

Hosts: In birds and mammals in the gall bladder and bile duct (seldom in intestine).

Type species: ✓ Dicrocoelium lanceatum Stiles and Hassall, 1896

Other species: D. lanceatum var. symmetricum Baylis, 1918
✓ D. albicole (Rud., 1819)
D. rileyi Macy, 1931
✓ D. hospes Looss, 1907
✓ D. macaci Kobayashi, 1920
✓ D. macrostomum Odhner, 1911
✓ D. colobusicola Sandground, 1929
✓ D. ~~paba~~ pandu riforme Railliet, 1900
D. kalmikensis Skrj. & Issaitschikoff, 1927
✓ D. rossicum Skrj. & Issait., 1927
✓ D. lasiuri McIntosh, 1933
D. soricis Joyeaux & Baer, 1936

Dicrocoelium Duj., 1845

Generic diagnosis. — Dicrocoeliidae, Dicrocoeliinae, Dicrocoeliini: Body lanceolate, more or less widened behind middle, aspinose. Oral sucker subterminal, followed by small pharynx. Esophagus short, ceca terminating some distance short of posterior extremity. Acetabulum subequal to oral sucker, in anterior third of body. Testes diagonal, close to each other behind acetabulum. Cirrus pouch pre-acetabular, containing winding seminal vesicle, pars prostatica, and ductus ejaculatorius. Genital pore at or near intestinal bifurcation. Ovary submedian, imme-

diately posttesticular. Vitellaria extracecal, at or near middle portion of body, limited in extent. Uterine coils occupying most of hindbody; eggs small, dark brown when mature. Excretory vesicle tubular, with oblique arms. Parasitic in liver, bile ducts and gall bladder of mammals and birds.

Genotype: *D. lanceatum* Stiles et Hassall, 1898 (pro *Fasciola lanceolata* Rud., 1803, nec Schrank, 1790) (Pl. 91, Fig. 1100), syn. *D. dendriticum* (Rud., 1819); *D. macaci* Kobayashi, 1915, in cattle, buffaloes, sheep, deer, hare, rabbit, goat, pig, donkey, horse, cat, dog, bear, *Nemorhoedus goral*, *Cercocebus*, *Cercopithecus*, *Semnopithecus*, occasionally in man; cosmopolitan. Flame cell formula of $2 \times 6 \times 2$ type.

Cercaria cystophora Wagener from *Planorbis marginatus*, probably referable to *D. lanceatum* — Willemoes-Suhm (1871); direct infection by drinking cercaria-containing water — Zarnik (1910); *Cercaria vitrina* from *Zebrina detrita*, *Helicella (Xerophila) candidula* probably develops into *D. lanceatum* — Vogel (1929); in spite of successful emergence of miracidia in *Euomphalia strigella*, *Xerophila ericetorum*, *X. obvia*, *Helicogena pomatia*, *Cepaea (Tachea) hortensis*, *Agriolimax laevis* no further development occurred — Nöller (1929); cercaria (*vitrina*) of *D. dendriticum* developed in *Zebrina detrita*, *Tirquilla frumentum*, and *Xerophila candidula*. In a repeated feeding of *D. dendriticum* eggs to *Agriolimax agrestis* immature, unbranched sporocysts were recovered from two snails after three and a half, and four and a half months, respectively, but no mature larvae were found — Nöller and Enigk (1932). In *Zebrina detrita*, *Helicella ericetorum* and *H. candidula* miracidia of *D. lanceatum* developed through sporocyst of first and second generation to *Cercaria vitrina* — Mattes (1933, 36, 38); structure and development of *Cercaria vitrina* — Neuhaus (1936). *Ena obscura* as a new intermediate host — Mäder (1937); mode of infection and further development in definitive host — Neuhaus (1938). For further life history data see van den Berghe and Denecke (1938), Bhalerao (1947), Brown (1933), Cameron (1931), Krull and Mapes (1952), Mapes (1952), Travassos (1944), Mäder (1939), Skvortsov (1934, 35), Vogel (1929), Vogel and Falcão (1954). Infection experiment and observations on slime balls from *Cionella lubrica* (Müller) — Krull & Mapes (1952). *Zebrina detrita*, *Formica fusca*, *F. rufibarbus fuscoviridis*, *F. gagates* — Vogel and Falcão (1954).

Other species from mammals:

D. colobusicola Sandground, 1929, in bile duct of *Colobus* sp.; Belgian Congo.
D. hospes Looss, 1907, in bile ducts of *Bos taurus*; Sudan. Also in *Vespertilio muricola* and *Rhinopoma microphyllum* — Northup (1928).

D. lasiuri McIntosh, 1933, in gall bladder and biliary tubules of liver of *Lasiurus borealis*; Washington, D. C.
D. rileyi Macy, in biliary bladder and ducts of *Tadarida cynocephala*; U.S.A. Also in *Nycticeius humeralis*; Texas.
D. moschiferi Oschmarin, 1952, in *Moschus moschiferus*; Russia.
D. orientale Sudarikov et Ryjikov, 1951, in *Moschus moschiferus* and *Cervus canadensis*; Russia.
D. soricis (Dies., 1858) Dollfus, Callot et Desportes, 1934, in biliary duct and bladder of *Crocidura russula*, *Sorex araneus*, *S. minutus*, *S. macropygmaeus karpinskii*; Europe.

*or *dendriticum*?
see Krull, 1951

Dicrocoelium lanceatum Stiles & Hassall, 1896

Syn. D. dendriticum

5 to 12 mm by 1. to 2.5 mm. Greatest width postequatorial.

Oral sucker 0.300 to 0.400 in diameter

Acetabulum nearly the same or slightly larger, 0.400 to 0.450

Pharynx 0.120 to 0.130

Esophagus twice the diameter of pharynx

Ceca narrow, slightly sinuous, ending some distance anterior to posterior end.

Genital pore median at level of bifurcation

Testes lobed, oblique, zones partially superimposed.

Anterior testis slightly overlapping acetabulum

Cirrus sac about 0.500 to 0.600 long, extending to region of middle of acetabulum

Ovary submedian, rounded close to posterior testis.

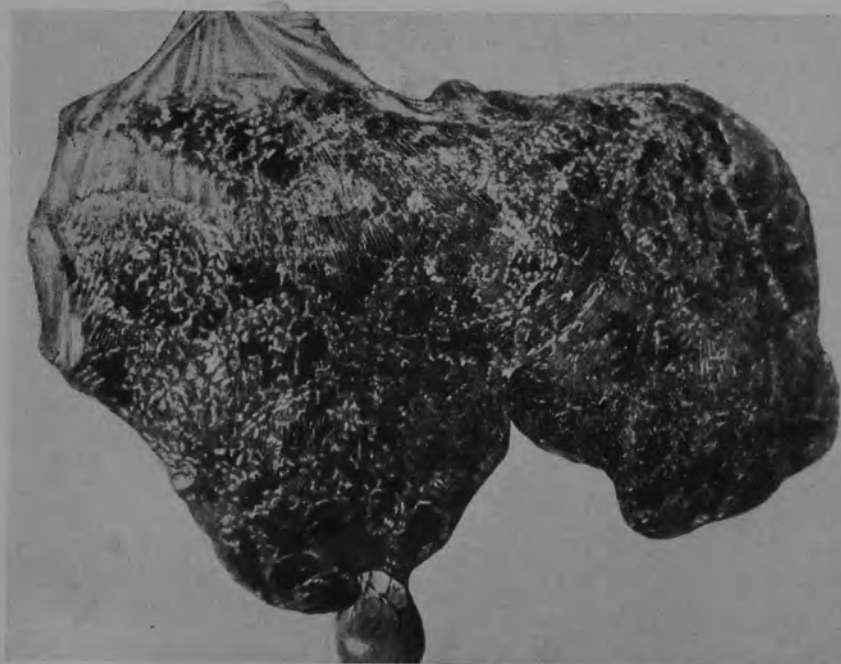
Seminal receptacle and shell gland postovarian.

Vitellaria lateral, from region of posterior testis to a little beyond middle of body.

Eggs thick-shelled, yellowish black (?), slightly assymetrical, 38 to 45 by 22 to 30 μ

In liver of: man, cattle, sheep, goat, pig, mule, etc. (?)

For variation in form see Dollfus, 1922. Bull. Soc. Zool. Fr., 47



12a. Печень овцы, пораженная дикроцелиозом (по Скрябину, 1911)

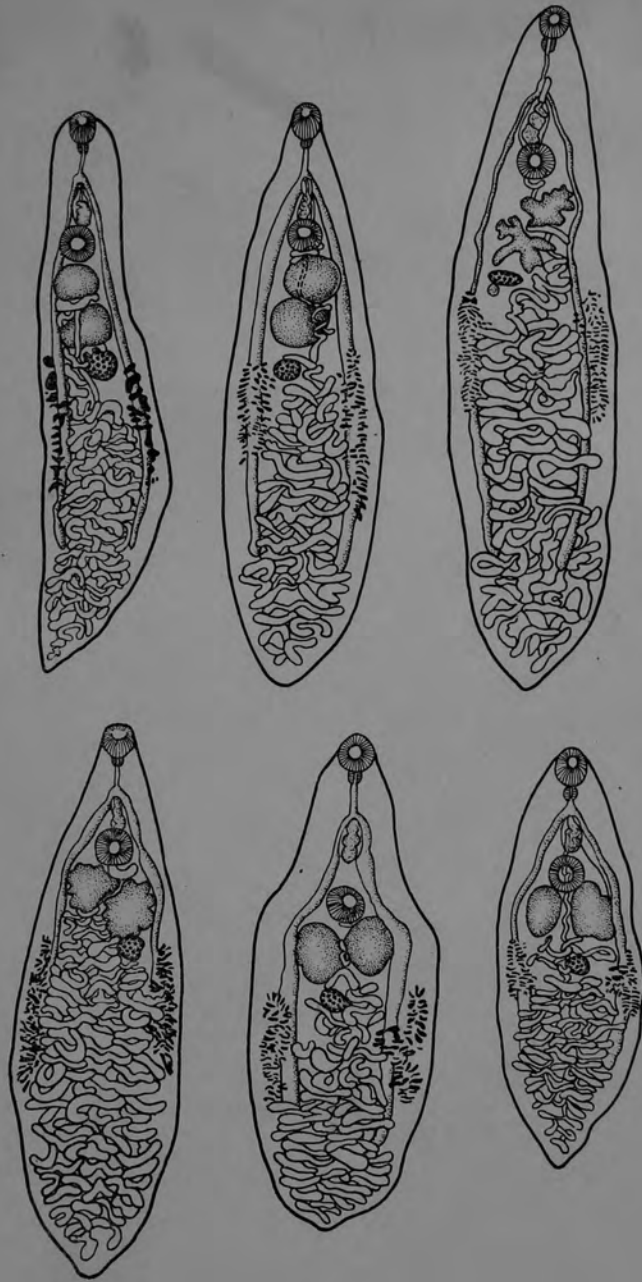
Liver of sheep infected with Dicrocoelium lanceatum

Сем. DICROCOELIIDAE



7. *Dicrocoelium lanceatum* Stiles et Hassall, 1896 (по Скрябину и Шульцу, 1928)

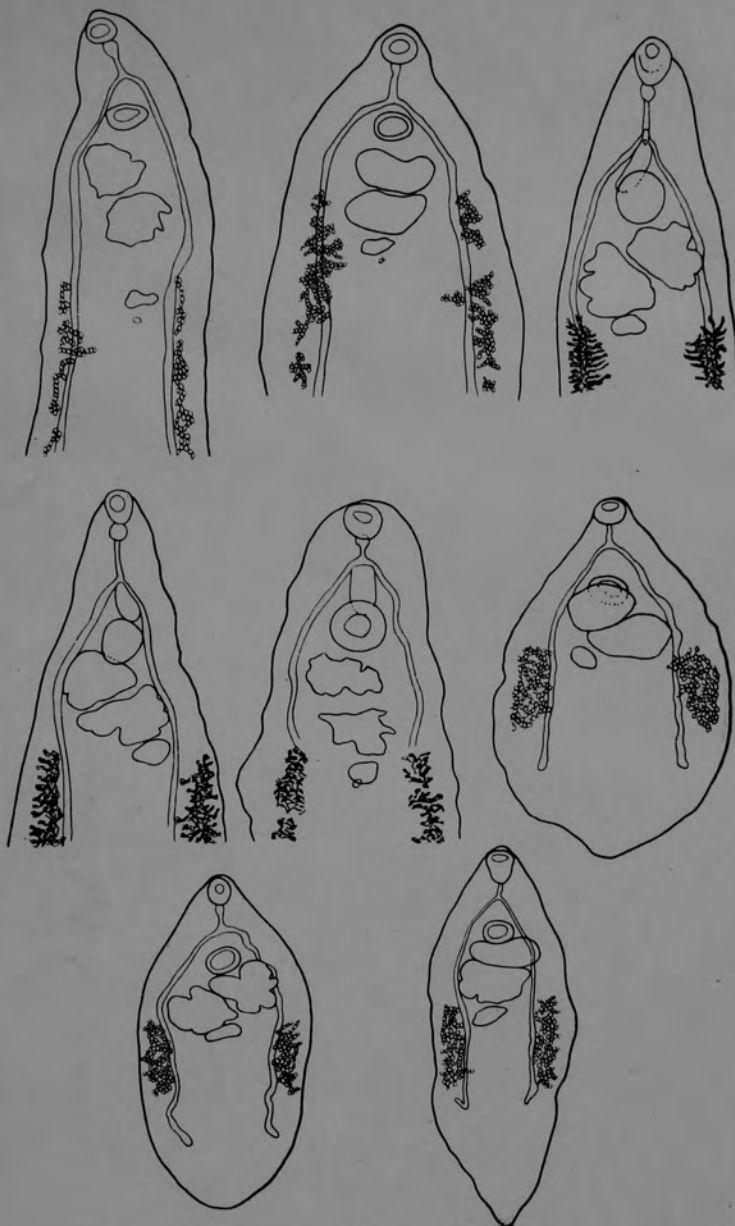
Сем. DICROCOELIIDAE



8

8. *Dicrocoelium lanceatum* Stiles et Hassall, 1896 (по Штрому, 1940)
Вариации в расположении органов

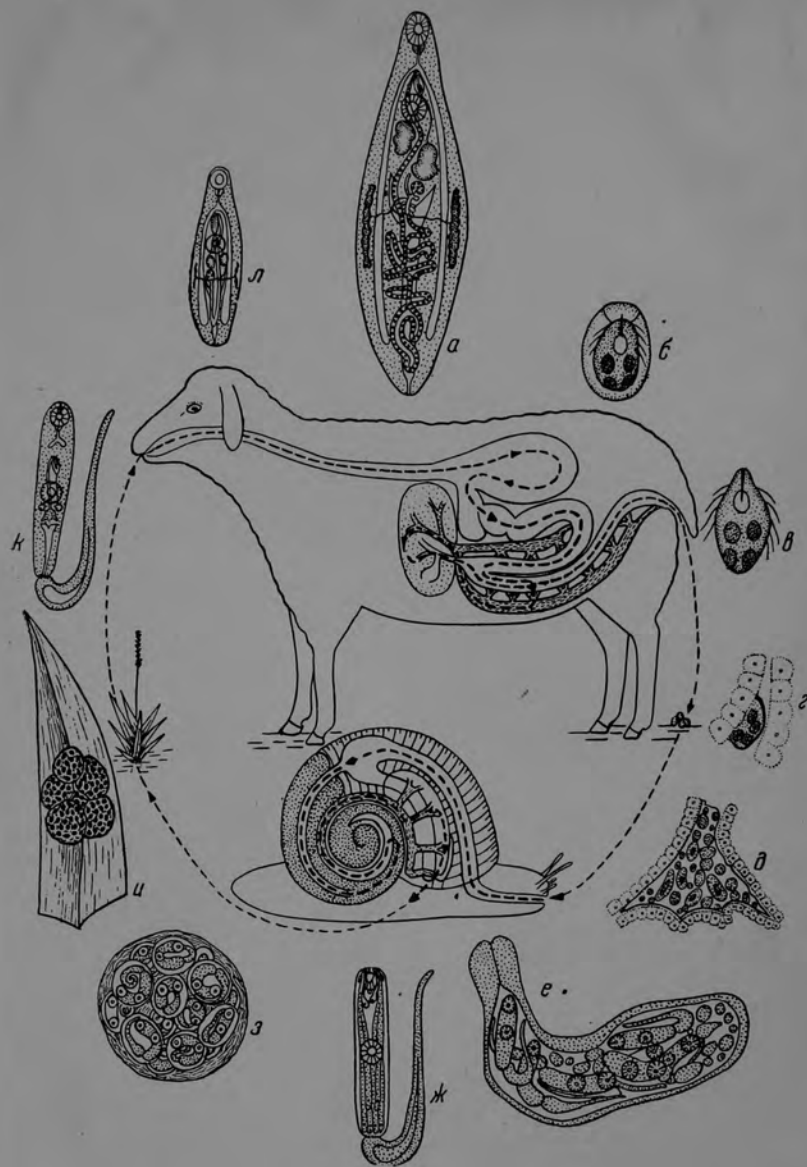
Сем. DICROCOELIIDAE



9

9. *Dicrocoelium lanceatum* Stiles et Hassall, 1896 (из Травассоса, 1944)
Вариации в форме и расположении половых органов

Сем. DICROCOELIIDAE



12

12. Цикл развития *Dicrocoelium lanceatum* Stiles et Hassall, 1896
(по Нейгаузу, 1938)

a — имаго; *б* — яйцо; *в* — вылупившийся мирацидий; *г* — мирацидий в внешней железе моллюска; *д* — формирование спороцисты; *е* — дочерняя спороциста с церкариями; *ж* — церкарий из дочерней спороцисты; *з* — цистообразное скопление церкариев; *и* — скопления церкариев, выделенных моллюсками на листьях растений; *к* — церкарий, освободившийся из цисты; *л* — молодая марита. В центре definitivoный хозяин — овца и промежуточный хозяин — сухопутный моллюск

Dicrocoeliidae

Dicrocoelium albicolle (Rud., 1819)

Length: 6. ,flat, lancet-shaped, widest in middle

Width: 1.

Oral sucker: 0.239 to 0.312

According to Dujardin:

Acetabulum: (size:) 0.312 to 0.390
(position):

oral: 0.34
ventral: 0.51

Sucker ratio:

Esophagus: very short or lacking ; ceca to region of hind end;
Pharynx: 0.092 wide, 0.083 long difficult to trace

Genital pore (location): between suckers in region of pharynx

Testes, shape:

location: at almost equal level

Cirrus sac (extent):

Ovary, shape:

location:

Vitellaria: begin behind the acetabulum by a space 1 to $1\frac{1}{2}$ times its diameter, extend to scarcely beyond midbody

Eggs: average 24 by 15; range 21 to 32 μ in length

Other features:

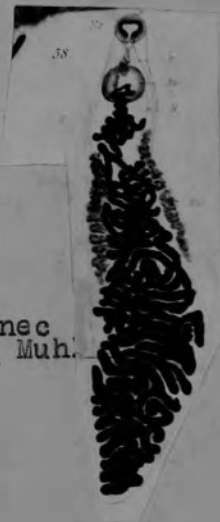
Host: Aquila pennata (= Falco pennatus)

Locality: Europe ? Vienna Museum.

Reference: Braun, 1902, Zool Jahrb., 16: 99#100

Comparisons: nearest to Dicrocoelium clathratum (Desl.) nec
D. clathratum Olsson, Muhl. :: Dist. refertum Muhl.

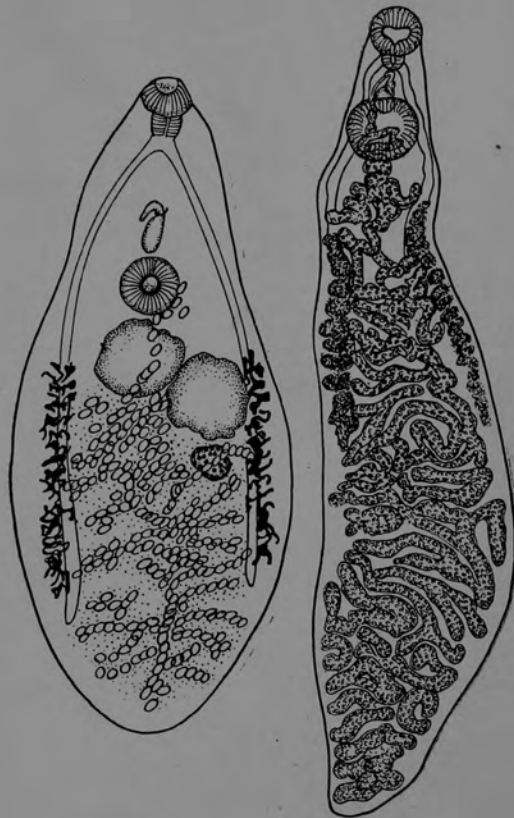
Life cycle:



Dicrocoelium albicolle (Rud., 1819)

Host: Aquila pennata

Сем. DICROCOELIIDAE



13

14

13. *Dicrocoelium lanceatum* (Stiles et Hassall, 1896) *sciuri* Artjuch, 1952
(по Артюху, 1952)

14. *Dicrocoelium albicolle* (Rudolphi, 1819) (по Брауну, 1902)

Dicrocoelium colobusicola Sandground, 1929

Length: 3.6 to 5.2 mm.

Width: Greatest width in largest specimen is 1.9 mm. at a post-equatorial point level with post. border of yolk glands.
Oral sucker: 0.22 to 0.28 mm. in diameter.

Acetabulum: (size:) 0.20 to 0.28 mm.
(position): About 1/5 body length from anterior end.

Sucker ratio: Acetabulum slt. smaller than oral sucker.

Esophagus: About 1.5 mm. long
Pharynx: Muscular, 0.08 to 0.12 mm. in length.

Genital pore (location): Just posterior to point of bifurcation of esophagus.

Testes, shape: Deeply lobed in type specimen. In other specimens a lobed condition is not noted.

location: Second quarter of the body.

Cirrus sac (extent): Absent.

Ovary, shape: Usually ovoid, sometimes almost spherical.

location: Immediately behind the right testis.

Vitellaria: Consist of large aggregations of glands connected by rather narrow longitudinal ducts forming a moniliform band, which stretches on each side from a point just posterior to the

Eggs: 44 to 48.2 by 28.3 μ . Have slt. shpolder & operculum.

Other features:

vesicula seminalis to about the equator of the body. The transverse vitelline ducts were not conspicuous.

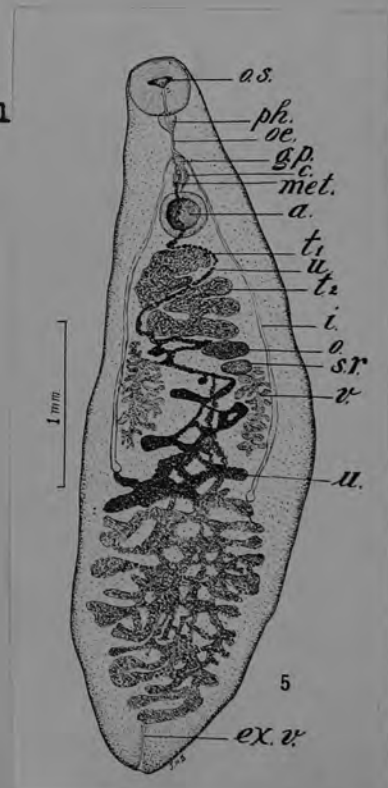
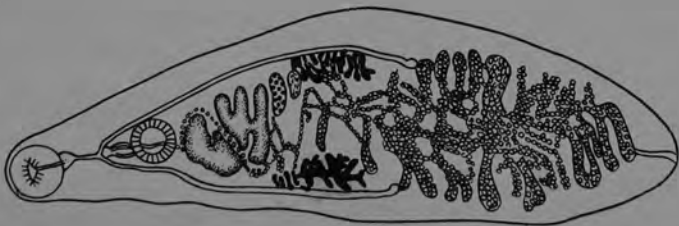
Host: Colobus species

Locality: Ituri Forest, Belgian Congo.

Reference: Proc. of U.S. Nat. Museum, 75, Art. 12, 1

Comparisons: D. hospes Looss, 1907
D. macrostomum Odhner, 1911

Life cycle:



Dicrocoelium eurynorhynchi Belopolskaja, 1954

Host: Eurynorhynchus pygmaeus (a bird)

Locality: Primorski krai (Russia)

This is from Yamaguti (1958).

Nachdruck verboten

Notizen zur Helminthologie Aegyptens. VII.

Ueber einige neue Trematoden der ägyptischen Fauna.

Von Dr. A. Looss, Professor of Parasitology, School of Medicine, Cairo.

Mit 7 Figuren.

Ich gebe in dem Folgenden kurze Beschreibungen einiger neuer Formen, die ich im Laufe der letzten Jahre in Aegypten beobachtet habe.

1. *Dicrocoelium hospes* nov. spec. ^{Looss,}
1907

Fig. 1.

Gefunden von Dr. Symmers in den Gallenbläschen von Rindern, die aus dem Sudan importiert und in Cairo geschlachtet wurden.

Länge der konservierten Exemplare 7 bis 9 mm; größte Breite 1,2 mm; dieselbe beginnt an der Höhe der Genitaldrüsen, nimmt von da nach vorn allmählich, aber nicht stark ab, bleibt dagegen bis an das Hinterende gleich, so daß dieses breit abgerundet ist. Haut sehr dünn, glatt. Saugnapfe in der Größe wenig verschieden, Mundsaugnapf 0,33—0,35, Bauchsaugnapf, bei normal gestrecktem Körper von jeher etwa 0,9—1 mm abstehend, 0,38 mm im Durchmesser. Pharynx klein, kugelig, 0,1—0,11 mm dick. Oesophagus dünn, etwa 3mal so lang wie der Pharynx. Darmschenkel wegen ihres schwach entwickelten Epithels schwer sichtbar, von sehr ungleicher Länge; der linke ungefähr 2 mm vor dem Hinterende endigend, der rechte um 0,5—0,7 mm länger. Genitalöffnung median, gerade unter oder etwas vor der Darmgabelung gelegen. Cirrusbeutel wenig muskelkräftig, schlank keulenförmig, bis etwa zum Zentrum des Bauchsaugnapfes hinabreichend. Samenblase wenig gewunden, Pars prostatica klein, Ductus ejaculatorius ungefähr halb so lang wie der Cirrusbeutel und gestreckt in ihm liegend. Hoden ziemlich dicht hinter dem Bauchsaugnapfe, mit minimaler Abweichung gerade und unmittelbar hintereinander; ganzrandig, von querovaler Form und der Darmschenkel leicht nach außen drängend. Ovarium etwas hinter dem Hoden, linksseitig von querovaler Gestalt und etwa halb so groß wie diese. Laurer'scher Kanal vorhanden, ein Receptaculum seminis mit Bestimmtheit nicht zu erkennen. Dotterstöcke relativ wenigen, aber großen Follikeln aufgebaut, beginnen am Ende des Schalendrüsenskomplexes und reichen von dort 0,7—0,8 mm weit nach hinten; auch sie liegen völlig innerhalb der Darmschenkel. Absteigender und aufsteigender Uterusast deutlich nebeneinander (ersterer links, letzterer rechts) in der Weise, daß ihre Querschlingen, die etwa die halbe Körperbreite



Fig. 1. *Dicrocoelium hospes* n. sp. von der Bauchseite. Vergr. ca. 17.

den Bauchsaugnapf verfolgen lassen, allem Anscheine nach aber weiter nach vorn bis an die Höhe der Genitalöffnung gehen, somit eine ähnliche Ausdehnung besitzen, wie sie Braun bei *Ph. lucorum* beobachtet hat.

Der Genitalporus liegt unter der Darmgabelung, also dem Ende des Pharynx sehr genähert. Kopulationsorgane außerordentlich entwickelt. Cirrusbeutel in gestrecktem Zustande ungefähr 1,6 mm lang; der hintere Teil kommt beinahe die Hälfte (0,75 mm) auf den leicht spindelförmigen, geschwollenen Teil, der die einfache, nicht gewundene Samenblase umschließt und gewöhnlich hinter dem Cirrusbeutel gelegen ist. Pars prostatica gegen den Penis nicht scharf abzugrenzen, letzterer mit mächtiger Muskulatur gegen das Ende hin sehr kräftiger Muskulatur und stark gefalteter innerer Bekleidung, anscheinend aber unbewaffnet. Hoden im Hinterende, leicht seitlich dicht hintereinander, bei allen Individuen mit mehr oder weniger scharf eingekerbten Rändern. Ovarium kurz vor den Hoden median

sinnnehmen, in der Mittellinie zur Berührung und hier und da auch Deckung gelangen. Vom Ende der Dotterstöcke ab geht der Uterus auf der Ventralseite in Zickzackwindungen zwischen den Organen durch, bis er am Ende des Cirrusbeutels in die Vagina übertritt. Diese dünn, aber relativ lang, denn sie beschreibt, während sie neben dem Cirrusbeutel einherzieht, mehrfache kurze Windungen.

Eier vom Typus der *Dicrocoelium*-Eier, 0,35—0,4 mm lang, 0,25 mm dick, mit mäßig dicker, dunkelgelbbrauner Schale, ziemlich regelmäßig oval, jedoch am Deckelpole meist etwas breiter als am entgegengesetzten. Sie enthalten in den terminalen Uterusschlingen ein reifes Miracidium, in dessen Hinterkörper zwei ebensolche körnige und stark glänzende Körper liegen, wie bei *Dicrocoelium lanceatum*.

Dicrocoelium hospes Looss, 1907

7 to 9 by 1.2 mm.

Oral sucker 0.33 to 0.35

Acetabulum 0.38, 0.9 to 1 mm. from anterior end.

Esophagus about three times as long as pharynx.

Pharynx 0.1 to 0.11 in diameter

Genital pore median a little below bifurcation.

Left ceca to about 2 mm. from posterior end; the right
cecum 0.5 to 0.7 longer

Testes more or less tandem, shortly behind acetabulum

Cirrus sac reaching to about the center of acetabulum.

Ovary posttesticular, to the left, about $\frac{1}{2}$ as big as testes.

Vitellaria with relatively few follicles beginning at
level of shell gland and extending about 0.7 to 0.8 mm.,
chiefly intercecal.

Eggs 35 to 40 by 25 μ

Host: cattle

Locality: Cairo, Egypt

Reference: Centralb. Bakt., Abt. I, Orig., 43:478-490. 1907



Dicrocoelium hospes Looss, 1907

Host : *Ovis aries*. L., Sudan sheep (Mammalia: Bovidae).

Location : Bile duct.

Locality : University Farm, Achimota, Nr. Accra, Ghana.

Date : 3 May 1957.

Specimens deposited : USNM Helm. Coll. No. 71746.

Discussion : Our collection consists of six adult worms. Doss (1964) lists cattle, sheep, camels, and vespertilionid and rhinopomatid bats as hosts from Egypt, Sudan, Uganda, Nigeria, and Burma. Wolfe (1966) reports this species in cattle from Ghana, Upper Volta, and Mali; also, he notes spurious infections of man after eating beef liver containing eggs. Odei (1966) records adult worms in cattle, goats, and man in northern Ghana. Segal, Humphrey, Edwards and Kirby (1969) list cattle, sheep, and buffalo as hosts from Cameroon and Congo (Brazzaville).

From Fischthal and Thomas, 1971

Dicrocoelium kronschnepi Belopolskaja, 1963

Host: Numenius madagascariensis

see reprint

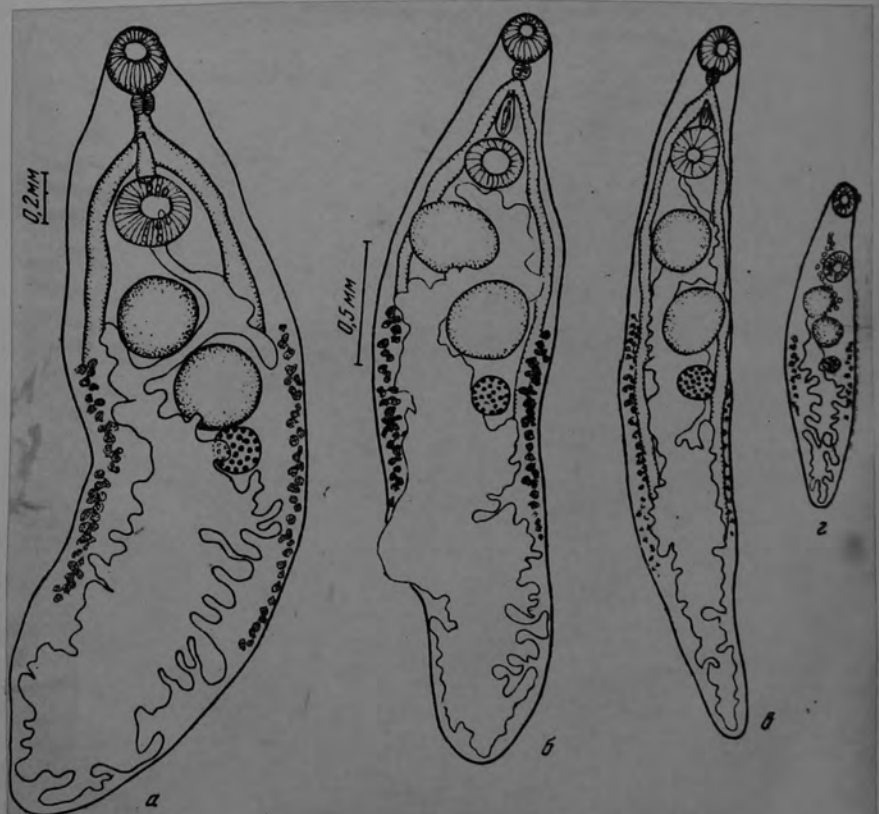


Рис. 3. *Dicrocoelium kronschnepi* nov. sp. от *Numenius madagascariensis*
а — типовой экземпляр; б — в — вариации размеров трематод от одной птицы

Dicrocoeliidae

Dicrocoelium lasiuri McIntosh, 1933

Body lancet-shaped, 2.47 mm. long by 650 μ wide, anterior sucker 160 μ and acetabulum 170 μ in diameter, the latter about 570 μ from anterior end. Pharynx 62 by 60 μ , apparently preceded by short prepharynx and followed by slightly longer esophagus. Ceca slightly undulating, extending about $\frac{2}{3}$ length of body; lemon yellow cuboidal crystals of some substance noted in ceca of living specimens, which did not dissolve in processes of fixation and mounting. Excretory bladder Y-shaped, with a ~~very~~ long stem extending from level of cecal tips to excretory pore. Testes 140 to 190 μ in diam., subtriangular, lobed or irregular in outline situated somewhat obliquely. Vasa efferentia uniting near level of anterior margin of acetabulum, forming short vas deferens and passing immediately into cirrus sac; each vas efferens slightly expanded near its middle and filled with spermatozoa. Cirrus sac 210 by 125 μ , between acetabulum and intestinal fork, containing coiled seminal vesicle. Genital pore at fork of intestine, 340 μ from anterior end of body. Ovary 200 to 210 μ in diameter, somewhat irregular in outline, immediately caudal to posterior testis. Laurer's canal and Malpighi's gland present. Vitellaria in zone occupied by postovarian portion of ceca, arranged in 2 lateral groups of approximately 20 follicles each. Uterus filling posterior portion of body and extending anteriorly in median field to genital pore. Metraterm to right of cirrus sac. Eggs 38 by 22 μ .

Habitat: Gall bladder and biliary tubules of liver of bat, Lasiurus borealis. Washington, D.C.

Differs from D. rileyi in that the ovary is as large or larger than testes, and it has twice as many vitelline follicles. D. panduriforme is a bird parasite and has a very large acetabulum.

Above from McIntosh. Proc. Helm. Soc. Wash., 2:60.

The Dicrocoelium hospes Looss of Northup, 1928 cannot be that species according to McIntosh. It is not sufficiently described.



Dicrocoeliidae

Dicrocoelium macaci Kobayashi, 1920

4.5 to 5 by 1 to 1.5 mm. Cuticle with minute protuberances.

Oral sucker 0.25

Acetabulum 0.32, 1/6 to 1/7 from anterior end

Pharynx 0.06 in length

Esophagus 0.1 to 0.2 in length

Genital pore slightly posterior to bifurcation

Testes directly posterior to acetabulum, symmetrical or slightly oblique, lobate or irregularly square.

Cirrus sac antero-dorsal to acetabulum

Ovary posterior to left testis near midline.

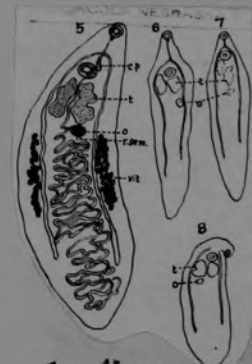
Vitellaria extracecal, in middle third of body.

Eggs 42 to 45 by 25 μ

Host: Macacus speciosus (monkey)
in liver

Locality: Japan

Reference: Parasitology, 12:380-410. 1920



From Kobayashi, 1921

Dicrocoeliidae

Dicrocoelium macrostomum Odhner, 1911

3.65 to 4.75 by 1. to 1.5. Shaped like D. lanceolatum

Oral sucker 0.28 to 0.33

Acetabulum 0.19 to 0.23; 0.75 to 1.15 from anterior end.

Sucker ratio: 3:2

Pharynx 0.07 to 0.09 in diameter

Genital pore at bifurcation

Testes as in D. lanceolatum, more or less lobed.

Ovary varied, spherical and smooth or lobed.

Vitellaria short, extending 0.5 to 0.65 about in the middle of the body, follicles few and large, anterior limit at posterior testis.

Eggs 40 to 43 by 26 μ

Host: Numida ptilorhyncha (a bird)
gall bladder and bile duct

Also in Coturnix coturnix
Russia

Locality: White Nile, Egypt

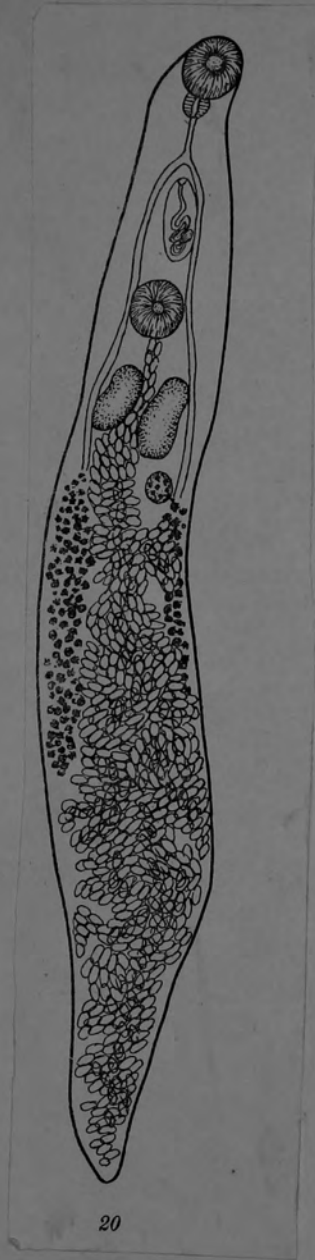
Reference: Odhner, 1911



FROM ODHNER, 1910

Dicrocoelium moschiferi Oschmarin, 1952

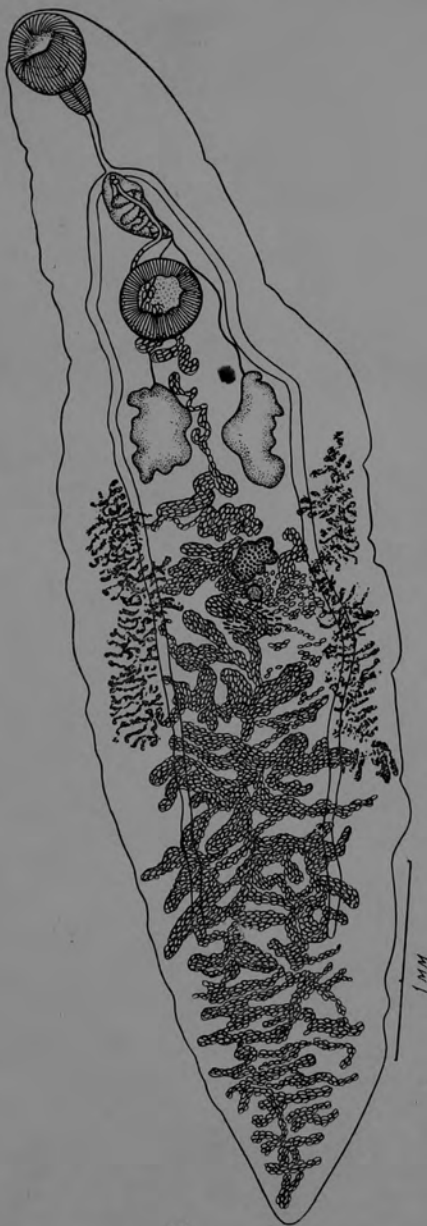
Host: Moschus moschiferus



Microcoelium orientalis Sudarikov & Ryjikov, 1951

Hosts: Moschus moschiferus
Cervus canadensis buedorfi

Сем. DICROCOELIIDAE



21

21. *Microcoelium orientalis* Sudarikov et Ryjikov, 1951 (по Сударикову
и Рыжикову, 1951)

Dicrocoeliidae

Dicrocoelium panduriforme Railliet, 1900

3.6 by 1. mm. Body with a pronounced constriction at level of posterior third of body and prolonged in front of neck

Oral sucker subterminal, 0.320
Acetabulum 0.500

Genital pore posterior to pharynx

Testes almost side by side, posterior to acetabulum

Cirrus ~~sae~~ 140 by 70 μ

Ovary as large as testes, a short distance posterior to right testis.

Vitellaria in continuous band, at first wide by attenuating toward the ends. Near middle of posterior enlargement.

Eggs 42 to 45 by 22 to 25 μ

Host: Pica pica (a bird)

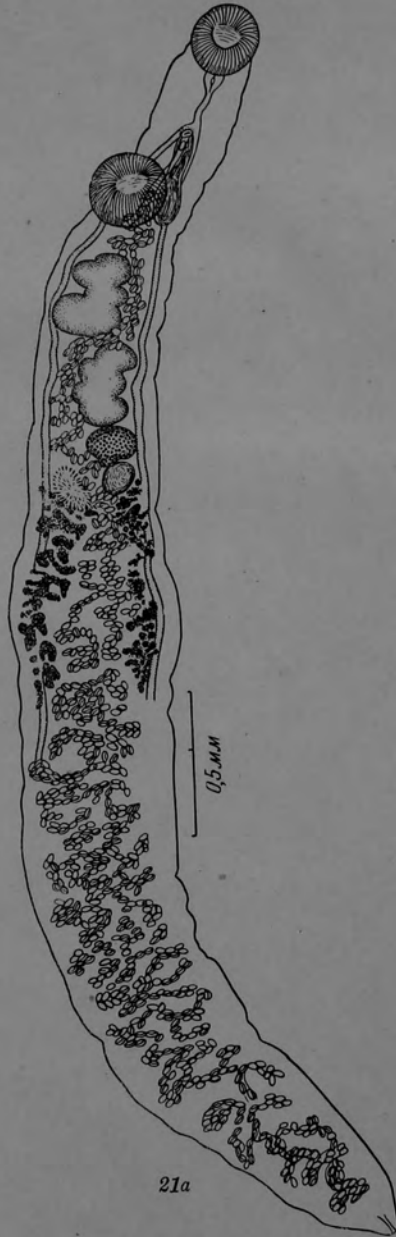
Locality: France

Reference: C.R.Soc.Biol., 53:239-242. 1900

Dicrocoelium petrovi Kassimov, 1952

Host: Alectoris graeca caucasica

Сем. DICROCOELIIDAE



21a. *Dicrocoelium petrovi* Kassimov, 1952 (по Касимову, 1952)

Dicrocoelium rileyi Macy, 1931

Host: Tadarida cynocephala

Сем. DICROCOELIIDAE



22

22. *Dicrocoelium rileyi* Macy, 1931 (по Мэсп, 1934)

а — марита; б — женская половая система

Dicrocoeliidae

Dicrocoelium rossicum Skrjabin & Isaitschikoff, 1927

Maximum length 2.9, width 0.07 in region of genital organs.
Oral sucker 0.246 long and 0.277 wide.
Acetabulum 0.46 long by 0.44 wide; 0.677 from anterior end.

Esophagus very short; pharynx 0.13 long and 0.15 wide.
Genital pore median, just behind pharynx, opposite esophagus.
Testes roundly oval, about in middle of body, oblique.
Ovary same size as testes, median, behind posterior testis.
Vitellaria from level of middle of testes, extending
0.95 to 1. mm., ending some distance anterior to end of
ceca,

Eggs: ?

Host: Conturnix communis (a bird)
in gall bladder

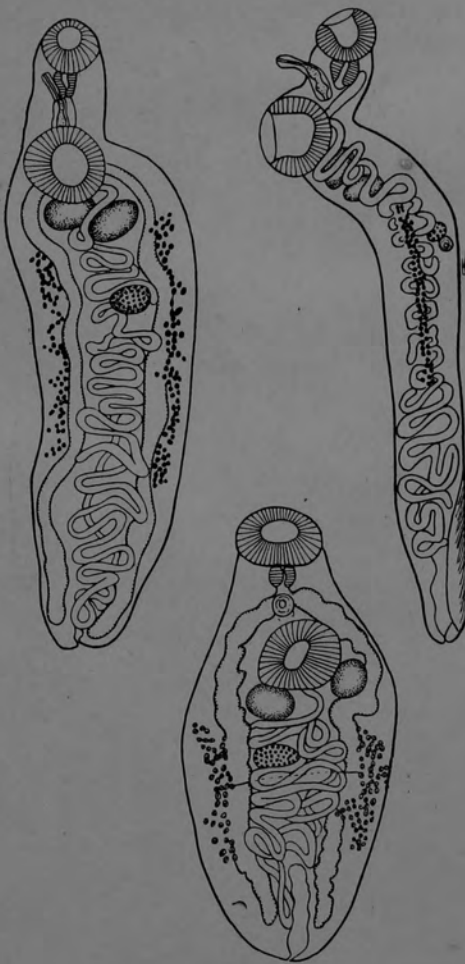
Locality: Nowotscherkassk

Reference: Ann. Trop. Med. Parasit., 21:303-308. 1927

Dicrocoelium soricis (Diesing, 1858)

Host: Sorex araneus
Crocidura russula

Сем. DICROCOELIIDAE



23

23. *Dicrocoelium soricis* (Diesing, 1858) (по Жуайе и Бору, 1936)

DICROCOELIUM

LOOSE LEAF ORGANIZER

SCHEDULE

DAY TIME									
COURSE MON. INSTRUCTOR									
COURSE TUE. INSTRUCTOR									
COURSE WED. INSTRUCTOR									
COURSE THU. INSTRUCTOR									
COURSE FRI. INSTRUCTOR									
COURSE SAT. INSTRUCTOR									

NAME _____

ADDRESS _____

SCHOOL _____ TELEPHONE _____

Allocorrigia ~~gen. n.~~ TURNER AND CORKUM, 1977

DESCRIPTION: Body filiform, spinous. Aacetabulum very near anterior end, postbifurcal, smaller than oral sucker. Prepharynx short. Esophagus short or absent. Ceca to near posterior end. Genital pore at level of or slightly anterior to cecal bifurcation. Common genital

atrium present. Cirrus pouch preacetabular, seminal vesicle internal. Testes separate, tandem in anterior fourth of body. Ovary posttesticular in anterior of mid-third of body. Seminal receptacle absent. Laurer's canal present. Uterus with single posterior and anterior loop. Vitellaria postovarian with lobed follicles confined to mid-third of body. Excretory bladder tubular, reaching level of vitelline field.

Allocorrigia filiformis sp. n. TURNER AND CORKUM, 1977
(Fig. 1)

DESCRIPTION: Body filiform, 6.29–11.6 mm long by 0.09–0.28 mm wide. Tegument with minute spines extending only to level of pharynx. Anterior sucker terminal, 52–100 by 56–112. Mouth slightly subterminal. Acetabulum in anterior sixteenth of body, postbifurcal, weakly formed, 44–78 by 42–70. Prepharynx short, 54 by 50. Pharynx muscular, 48 by 68. Esophagus short or absent. Ceca unequal in length, exceeding vitelline field and extent of uterus but not reaching posterior end of body. Genital pore median at level of or slightly anterior to cecal bifurcation. Common atrium present. Cirrus pouch preacetabular, elongate, 291 by 43. Seminal vesicle elongate, cirrus not spined. Testes elongate, tandem in anterior fourth of body, not separated by uterine coils. Anterior testis, 256 by 111. Posterior testis, 307 by 114. Vasa efferentia unite midway before entering cirrus pouch. Ovary posttesticular, in anterior of mid-third of body, 233 by 150. Seminal receptacle absent, basal portion of uterus congested with sperm. Laurer's canal present, directed anteriorly and extending to mid level of ovary. Uterus with single loop extending to near posterior end of body before proceeding anteriorly as a single loop. Eggs 25–30 by 12–14. Vitellaria postovarian with large lobose follicles confined to mid-third of body. Mehlis' gland poorly defined. Excretory bladder tubular, extending to level of vitelline field before receiving primary trunks.

TYPE HOST: *Procambarus clarkii* (Girard, 1852).

HABITAT: Antennal gland.

TYPE LOCALITY: Sorrento, Ascension Parish, Louisiana.

TYPE SPECIMENS: USNM Helm. Coll.: Holotype: No. 74053.

PARATYPES: No. 74054.

Discussion

On morphological grounds, *Allocorrigia filiformis* most nearly resembles members of the genus *Corrigia* Strom, 1940. It differs, however, in the following characters: anterior sucker larger than acetabulum; ceca not extending to posterior extremity; seminal receptacle absent; vitellaria large, lobose follicles; uterus not exceeding posterior level of ceca. There is a general similarity between *Allocorrigia* and *Skryabinosomum* Evranova, 1944, but a disparity exists in relative size of the acetabulum. Further comparison will be difficult until more descriptive information becomes available relative to the latter genus.

Allocorrigia filiformis is one of the few dicrocoeliids known to attain maturity and reproductivity in an invertebrate host. A similar kind of infection was described from Malaysia by Macy and Basch (1972) in which a dragonfly served as host. Like the species in Malaysia, *A. filiformis* is not encysted within the arthro-

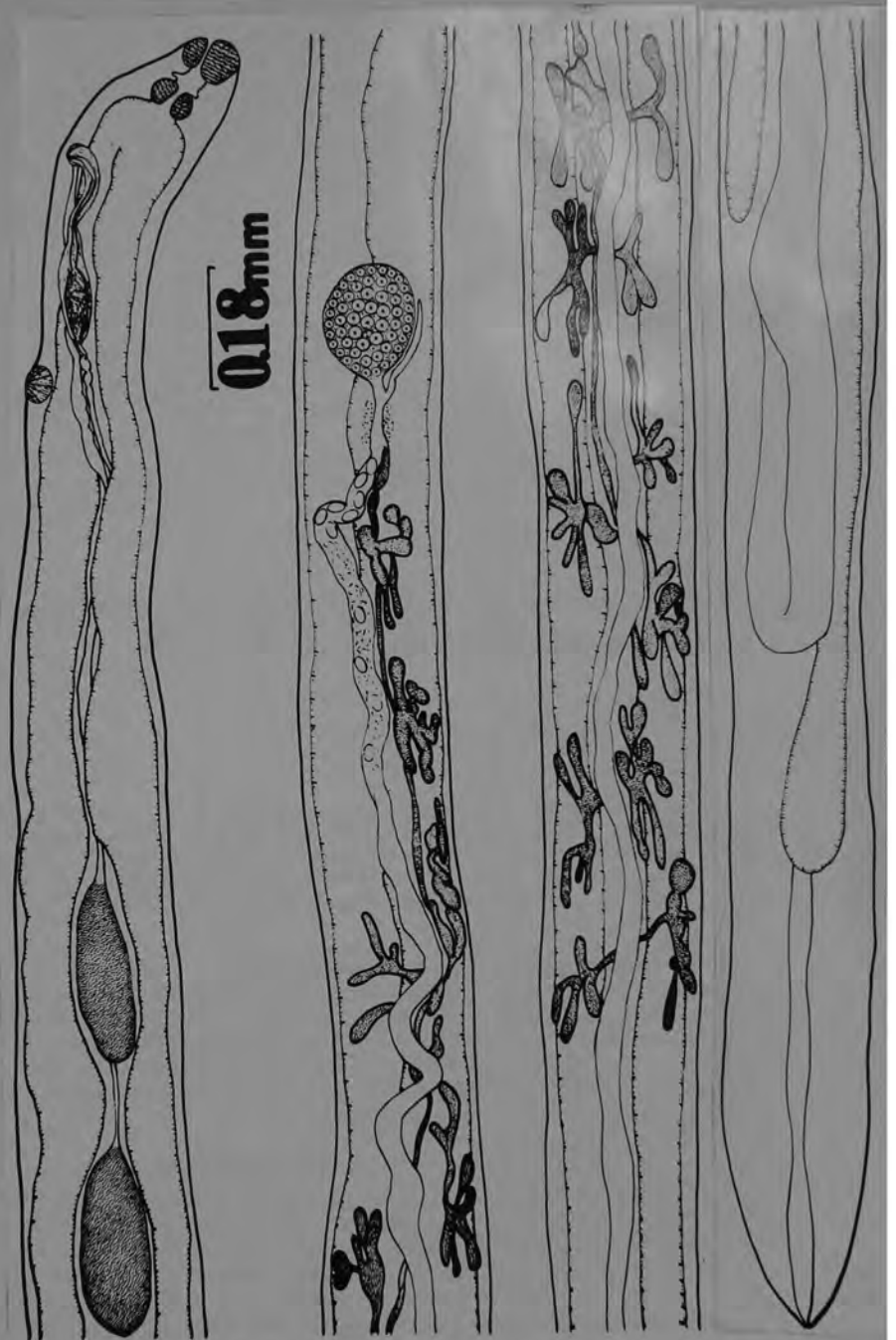


Figure 1. *Allocorrigia filiformis* gen. et sp. n. from *Procambarus clarkii*. Adult worm.

pod. Unlike the Asian form, it would not seem necessary for the crayfish to be eaten by a predator before the eggs could be liberated. Eggs containing active miracidia were frequently observed in the gravid worms, and in sectioned antennal glands a few eggs were observed in the excretory tubules. It could be assumed that eggs readily pass from the crayfish by way of the excretory pore of the antennal gland. The possible role of a vertebrate cannot be completely ruled out, however, for what we know of other dicrocoeliid life cycles indicates a strong linkage between an arthropod and vertebrate host. In any event, it is probable that an aquatic snail host is involved in the cycle and, as pointed out by Macy and Basch (1972), even though most dicrocoeliids have a terrestrial cycle, closely related plagiorchiids use an aquatic mollusc.

Dicrocoeliid trematode infections have been noted in the swamp crayfish, *Procambarus clarkii* (Girard, 1852) collected in the vicinity of Baton Rouge, Louisiana. Of the 88 specimens of *P. clarkii* examined, 57 had one to three live worms threaded through the interstices of their antennal or green glands. In 34 of the 57 crustaceans infected, both glands were involved. The worms ranged in development from mature to fully gravid. Other species of crayfishes examined from the same or similar habitats have not been found to be infected with this species of worm. Worms were dissected out of the antennal gland and studied live or fixed under coverslip pressure

in AFA and examined as whole mounts. Infected, whole antennal glands were removed and studied in section. The following description is based on 20 worms. The drawing was made with the aid of a microprojector and all measurements are given in microns unless indicated otherwise.

ALLOCORRIGIA

Anchitreminae nom. emend. for
Anchitreminae Mehra, 1935

Subfamily diagnosis. — Dicrocoeliidae: Body tongue-shaped, spinose. Acetabulum small, in anterior third of body. Esophagus short, ceca long. Testes symmetrical, postacetabular, extracecal. Cirrus pouch occupied by convoluted seminal vesicle, immediately preacetabular. Genital pore median, preacetabular. Ovary median, immediately posttesticular. Vitellaria extending from behind testes to near posterior extremity. Uterine coils mainly in posttesticular intercecal field. Excretory vesicle Y-shaped. Parasites of reptiles and mammals.

Anchitrema Looss, 1899

Generic diagnosis. — Dicrocoeliidae, Anchitreminae: Body thick, tongue-shaped, spined. Acetabulum small, in anterior third of body, or pre-equatorial. Oral sucker also rather small, esophagus very short; ceca long, narrow, reaching to posterior extremity. Testes symmetrical, just behind acetabulum, extracecal. Cirrus pouch occupied by convoluted seminal vesicle, immediately preacetabular (lacking after Looss). Genital pore median, pre-acetabular. Ovary nearly median, immediately

posttesticular. Receptaculum seminis formed by dilatation of basal portion of Laurer's canal. Vitellaria extending in extracecal fields from immediately behind testes to some distance short of posterior extremity. Uterus filling up entire posttesticular intercecal field, descending on one side and then ascending on the other side; eggs small, numerous. Excretory vesicle Y-shaped, arms as long as stem. Intestinal parasites of bats and chameleons.

Genotype: *A. sanguineum* (Sonsino, 1894) Looss, 1899 (Pl. 53, Fig. 650), in *Chamaeleo vulgaris*; Gabes in Tunisia. Also in rectum of bat, *Nycticejus kuhli* and *N. dormeri*; India. — Pande (1935).

Other species!

A. latum Gedeolst, 1919, in *Chamaeleon dilepis*; Belg. Congo.

A. sokolowi (Skrjabin, 1914) Dollfus, 1929, syn. *Mesocoelium sokolowi* Skrj., in *Chamaeleo*; Africa.

Genotype: *A. sanguineum* (Sonsino, 1895) Looss, 1899, in *Chamaeleo vulgaris*; Tunisia. Also in rectum of bats, *Nycticejus kuhli* and *N. dormeri*, India; "chauve-souris", Cairo — Gohar (1934).

Other representatives from mammals:

A. philippinorum (Tubangui, 1928) n. comb. (syn. *Platynosomum p. T.*) (Pl. 94, Fig. 1130), in *Scotophilus temminckii*; Philippines.

A. congolense (Sandground, 1937) n. comb., raised to specific rank on the basis of the differences pointed out by Sandground; in *Myotis bocagei cupreolus*; Belgian Congo.

Lecithodendriidae

Subfamily Anchitreminae Mehra, 1935

Lecithodendriidae. Ceca long, reaching near hind end. Excretory bladder Y-shaped with cornua about as long as stem. Genital pore median, preacetabular. Cirrus sac absent; seminal vesicle long, coiled. Testes close behind ventral sucker, symmetrically opposite, outside ceca. Ovary somewhat median, just behind testes. Vitellaria extracecal, posttesticular. Parasitic in intestine of bats and chameleon.

Type genus *Anchitrema* Looss, 1899

Dicrocoeliidae

Anchitreminae Yamaguti, 1959
Syn. Anchitreminae Mehra, 1935

Body tongue-shaped, spinose. Acetabulum small, in anterior third of body. Esophagus short, ceca long. Testes symmetrical, postacetabular, extracecal. Cirrus sac occupied by convoluted seminal vesicle, immediately preacetabular. Genital pore median, preacetabular. Ovary median, immediately posttesticular. Vitellaria extending from behind testes to near posterior end. Uterine coils mainly in posttesticular intercecal field. Excretory vesicle Y-shaped. Parasites of reptiles and mammals.

ANCHITREMA Looss, 1899

Anchitreminae: body thick, tongue-shaped, spined. Acetabulum small in anterior third of body, or preequatorial. Oral sucker also rather small, esophagus very short; ceca long, narrow, reaching to posterior end. Testes symmetrical, just behind acetabulum, extracecal. Cirrus sac occupied by convoluted seminal vesicle, immediately preacetabular (lacking after Looss). Genital pore median, preacetabular. Ovary nearly median, immediately posttesticular. Seminal receptaculum formed by dilation of basal portion of Laurer's canal. Vitellaria extending in extracecal fields from immediately behind testes to some distance short of posterior end. Uterus filling entire posttesticular intercecal field, descending on one side, ascending on the other; eggs small, numerous. Excretory vesicle Y-shaped, arms as long as stem. Intestinal parasites of bats and chameleons.

Type species: A. sanguineum (Sonsino, 1894) Looss, 1899
in Chamaeleo vulgaris; Gabes in Tunisia
Also in rectum of bat

Other species: A. latum Gedoelst, 1919; in Chamaeleon dilepis; Belgian Congo

A. sokolowi (Skrjabin, 1914) Dollfus, 1929
Synonym: Mesocoelium sokolowi Skrj.
in Chamaeleo; Africa

Lecithodendriidae

Anchitrema Looss, 1899

Body spinose (especially anterior portion), stout, oval in transverse section, elongate, tongue-shaped, tapering slightly cephalad and caudad, rather uniformly rounded. Oral sucker and acetabulum powerfully developed and close together. Pharynx present; esophagus short; ceca long, extend postacetabular to near caudal end. Excretory vesicle Y-shaped, its branches about as long as stem. Genital pore somewhat preacetabular, median. Cirrus sac absent; vesicula seminalis long, forms a loose coil; pars prostatica well developed; testes immediately postacetabular, symmetrical, close to lateral body margin, extracecal in cecal zone. Ovary about median, at caudal end of testes; receptaculum seminis absent, its place taken by a widened Laurer's canal; vitellaria fairly well developed, extracecal, posttesticular; uterine slings numerous, transverse. Eggs numerous, oval, only 24 μ by 14 μ . Adults in intestine of bats and chameleons.

Anchitrema lucknowensis n. sp. AGRAWAL, 1966
(Fig. 4)

DESCRIPTION: Body elongate, portion of body anterior to testes spinose, with rounded extremities, 1.3–2.6 mm long by 0.54–0.71 mm wide. Oral sucker sub-terminal, round, 0.12–0.30 mm long by 0.225–0.275 mm wide. Ventral sucker spherical, smaller than oral sucker, close to anterior border of testes, 0.14–0.20 mm long by 0.14–0.21 mm wide at 0.31–0.67 mm from anterior extremity. Prepharynx absent; pharynx well developed, 0.08–0.1 mm long by 0.075–0.1 mm wide; esophagus short, 0.025–0.040 mm long, intestinal caeca simple, extending parallel to body wall to posterior end of body.

Excretory pore at posterior end of body. It leads into a short wide tube which divides into two lateral limbs, one on either side.

Genital pore submedian, lying on anterior border of aperture of ventral sucker at 0.35–0.70 mm from anterior extremity.

Testes oval, subequal, symmetrical, pre-equatorial, right testis, 0.25–0.45 mm long by 0.17–0.25 mm wide at 0.43–0.79 mm from anterior extremity. Left testis, 0.25–0.51 mm long by 0.14–0.22 mm wide at 0.38–0.82 mm from anterior extremity. Cirrus sac flask-shaped, 0.30–0.52 mm long by 0.10–0.11 mm wide lying medially in front of ventral sucker either close or overlapping its anterior border, at 0.37–0.49 mm from anterior extremity. Vesicula seminalis tubular, spirally coiled or S-shaped, 0.26–0.45 mm long by 0.02–0.03 mm wide. Cirrus short, muscular, 0.065–0.125 mm long opening at genital pore. A large number of prostatic gland cells fill entire space in cirrus sac around vesicula seminalis.

Ovary nearly median, lying either between testes or immediately posttesticular, measuring 0.15–0.22 mm long by 0.14–0.21 mm wide at 0.55–1.12 mm from anterior extremity. From its posterior end arises oviduct which opens into ootype. A pear-shaped receptaculum seminis 0.038–0.10 mm long by 0.045–0.050 mm wide lies at posterior end of ovary and opens into ootype. Vitellaria follicular, arranged on sides of body extending from middle region of testes to 0.38–0.48 mm from posterior end of body. Two transverse vitelline ducts of each side join together to form a common yolk duct which opens at ootype. A large number of unicellular Mehlis' gland cells surround ootype and open into it. Uterus arises from posterior end of ootype, filling the posterior half of body, consisting of several transverse coils with ascending and descending limbs. Ascending limb passes forward on left or right side of ventral sucker and opens at genital pore. Eggs, 0.020–0.025 mm long by 0.01–0.015 mm wide.

HOST: *Nycticeius kuhlii* Rafinesque, 1819.

LOCATION: Small intestine.

LOCALITY: Lucknow, India.



DISCUSSION: Sonsino (1894) described *Distomum sanguineum* from the gut of *Chamaelo vulgaris*. Looss (1899) erected a new genus *Anchitrema* to accommodate this species as type. Subsequently two other species were assigned to this genus, viz., *A. latum* Gedoelst, 1919 and *A. sokolowi* (Skrjabin, 1914) Dollfus, 1929 syn. *Mesocoelium sokolowi*.

Thapar (1931) reported the occurrence of a new trematode, *Exorchocoelium indicum*, from the intestine of a yellow bat, *Nycticejus kuhlii*, from Lucknow. Pande (1935) considered its synonymy with *Anchitrema sanguineum* Looss, 1899.

Thapar (1956) obtained a few more specimens from the same host and made a critical study, besides other characters, mainly on the morphology of excretory system. He distinguished this genus from the genus *Anchitrema* in the complete absence of body spines, in the presence of a distinct cirrus sac and the presence of the receptaculum seminis, and in the position of a typical Y-shaped excretory system—characteristic of the family Dicrocoeliidae. The author does not agree with Thapar and considers that the characters mentioned by him are also present in the genus *Anchitrema*. In the genus *Anchitrema* the cirrus pouch is occupied by a convoluted seminal vesicle immediately preacetabular, the receptaculum seminis is formed by dilation of the basal portion of Laurer's canal and the excretory system is Y-shaped. The presence or absence of spines is a variable character even within the species. Hence there is no character quoted by Thapar that can be used to separate *Exorchocoelium* from *Anchitrema*; therefore, they are identical.

Yamaguti (1958) lists five species in the genus *Anchitrema*, of which two have been transferred from other genera considered by Yamaguti (1958) to be synonymous with *Anchitrema*, viz., *Platynosomum philippinorum* Tubangui, 1928 and *Platynosomum philippinorum congolense* Sandground, 1937.

Under the genus *Anchitrema*, the new form resembles closely *A. indicum* (syn. *Exorchocoelium indicum*) but differs from it in having spines on the anterior border of body, in the extension of vitellaria from middle region of testes to some distance short of posterior extremity, in having genital pore in the anterior border of acetabulum, in having subequal testes, in having flask-shaped cirrus sac, and in the possession of smaller size of eggs. (Thapar gave the size of receptaculum seminis as 0.42 mm by 0.16 mm; it should, probably, read 0.042 mm by 0.016 mm. The eggs are said to measure 0.19 mm in length and 0.02 mm in breadth which should, probably, read 0.019 mm in length and 0.002 mm in breadth.)

Dicrocoelidae

Anchitrema sanguineum (Sonsino 1894) Looss, 1899

II. Anchitreminae HEZINA (1935)

Anchitrema LOOSS (1899)

Anchitrema sanguineum SANSINO (1894) and LOOSS (1899). The chamaeleons in Hyderabad are cent per cent infected with this fluke. The parasites were usually recovered in large numbers, about 40-60 specimens from each host. During the summer months, however, light infections were recorded, about a dozen specimens from any single host.

Host: *Chamaeleon zeylanicus*. — Habitat: Stomach and intestine. — Locality: Hyderabad, India.

From S. S. Simha, 1958

FAMILY DICROCOELIIDAE OEHNER, 1911

GENUS *Anchitrema* LOOSS, 1899

A. sanguineum (Sonsino, 1894) Looss, 1899

In the past, *Anchitrema* has been placed in the Lecithodendriidae but we have followed the usage of Yamaguti, 1958.

Specimens were collected from *Taphozous perforatus*, October 2, 1952. Monastery Wadi Natroum, Western Desert; same host, January 9, 1952, caves and tombs at Abu Rauwash, Giza Province, same host and place, January 21, 1952. From *Nycteris thebaica thebaica*, caves near Abu Rauwash, and from Abu Sir tombs and caves, Giza Province; also from *Plecotus auritus christiei*, caves at Abu Rauwash. Finally a number of examples were found in *Pipistrellus kuhlii*, July 16, 1952, barns of King's Estates, Idfina, Beheira Province.

Specimens in U. S. Nat. Mus. Helm. Coll. No. 39262.

FROM MACY, HEYNEMAN, AND KUNTZ, 1961

FAMILY DICROCOELIIDAE ODHNER, 1911

GENUS *Anchitrema* LOOSS, 1899

1. *sanguineum* (Sonsino, 1894) Looss, 1899.

In the past, *Anchitrema* has been placed in the Lecithodendriidae but we have followed the usage of Yamaguti, 1958.

Specimens were collected from *Taphozous perforatus*, October 2, 1952. Monastery Wadi Natroum, Western Desert; same host, January 9, 1952, caves and tombs at Abu Rauwash, Giza Province, same host and place, January 21, 1952. From *Nycteris thebaica thebaica*, caves near Abu Rauwash, and from Abu Sir tombs and caves, Giza Province; also from *Plecotus auritus christiei*, caves at Abu Rauwash. Finally a number of examples were found in *Pipistrellus kuhli*, July 16, 1952, barns of King's Estates, Idfina, Beheira Province.

Specimens in U. S. Nat. Mus. Helm. Coll. No. 39262.

FROM MACY, HEYNEMAN & KUNTZ, 1961

FROM RÖHDE (1966)

Anchitrema sanguineum (Sonsino, 1894)
Looss, 1899

The only other representative of the Dicrocoeliidae, found in Malayan bats, is *Anchitrema*, an intestinal parasite. This worm is sometimes put in a separate family, i.e. Anchitremitidae Caballero, 1960 (compare Caballero, 1960) or included in the family Lecithodendriidae (comp. Skarbilovich, 1948).

Specimens, belonging to the genus *Anchitrema*, were found in the following hosts:

The Malayan specimens show a great degree of variation in their body size and, correspondingly, in the relative sizes of various organs and in the proportions of the body. While the small specimens are similar to the description for *A. philippinorum* (Tubangui, 1928) Skarbilovich, 1947, the medium-sized ones correspond to *A. congolense* (Sandground, 1937) Yamaguti, 1958, and the largest ones to *A. sanguineum* (Sonsino, 1894) Looss, 1899.

According to the descriptions, the three species differ in the size of the body (*A. philippinorum* 1.93 mm long, *A. congolense* 3.4 mm long, *A. sanguineum* 3.23–5.15 mm long), in the relative size of various organs, and in the proportions of the body, i.e., there is a relatively longer hindbody in the larger species.

Comparisons between Malayan specimens of different body size and with the three described species show that the Malayan specimens belong to the species *A. sanguineum* and that *A. philippinorum* and *A. congolense* are synonyms of *A. sanguineum*. The differences, mentioned above, are due to allometric growth of various organs and parts of the body.

Since many species descriptions of closely related forms of different size are based on such differences in relative organ sizes and body proportions without taking into account that these may be due to allometric growth, the data for *Anchitrema* are discussed in detail and some considerations concerning the allometric growth in other helminths are given.

In most animals, the growth of body and organs is three-dimensional and, therefore, can be expressed by the function formula $y = b \cdot x^\alpha$ where y = organ size, x = body size, α = allometric exponent, b = constant. This formula can be converted into $\log y = \log b + \alpha \cdot \log x$ which corresponds graphically, to a straight

line in a double-logarithmic system of coordinates. In order to get a linear relationship, this system was chosen for the graphical representation of the data for *Anchitrema*, i.e., for each specimen, the organ sizes are plotted against the body size in a system of double-logarithmic coordinates.

As shown by Röhdé (1961), the nematodes *Ancylostoma tubaeforme* (Zeder, 1800) and *A. caninum* (Ercolani, 1859), also grow at first three-dimensionally, while they grow predominantly in one direction during the last period of growth: in *Ancylostoma* this begins when the worms are 4 mm in length. This part of their growth can be represented as a straight line in a system of linear coordinates.

The size of the specimens of *Anchitrema* and their organs is given as average diameter, calculated from two-dimensional measurements (length \times maximum width) $\cdot 2$. This is justified, because *Anchitrema*, like most trematodes, is rather flat. Therefore, the thickness of the worms and organs can, for practical purposes, be neglected. For thick forms like, for instance, amphistomes, the size of body and organs should be given as average diameter calculated from three-dimensional measurements.

The graphs (Figs. 4–8) show that the data for the specimens of *Anchitrema* from all hosts belonging to all three "species" are arranged around continuous lines, thus indicating that the specimens belong to one species. The greatest variability is shown by the genital organs. The allometric exponents for the various organs which can be considered approximate only because of the relatively small number of specimens and the relatively great variability in the organ sizes, are 0.51 for

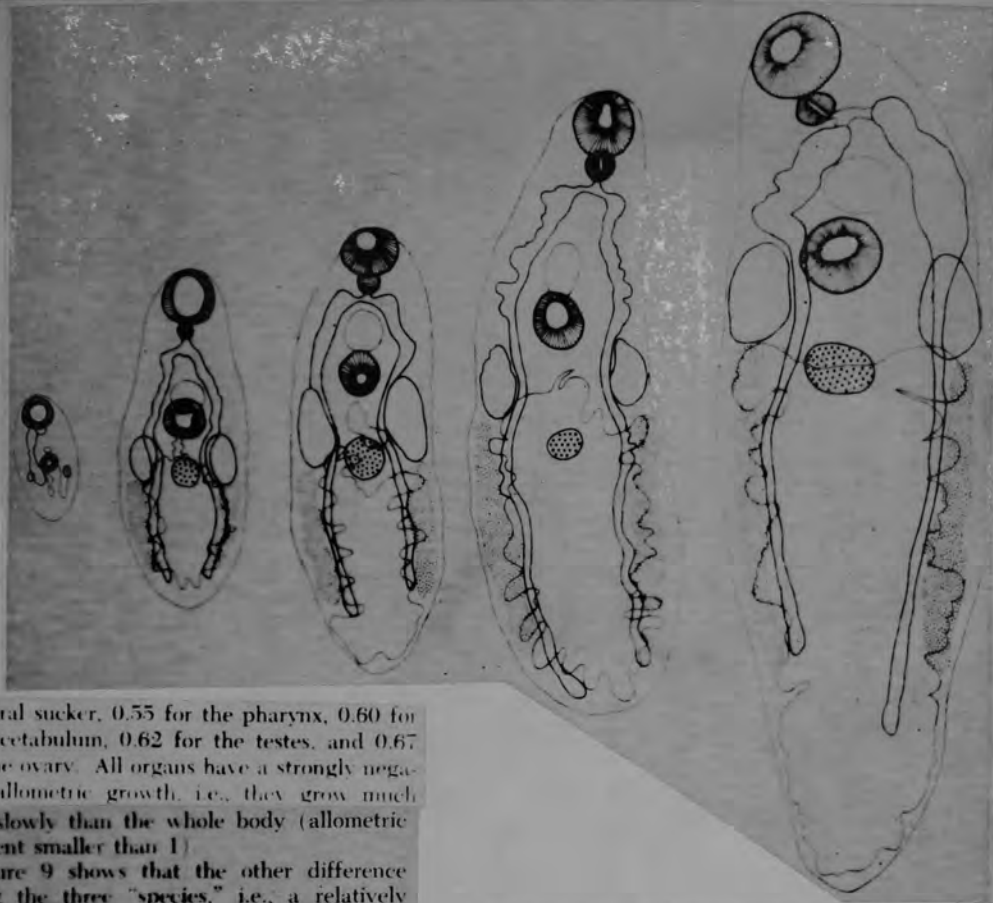


Fig. 9. *A. sanguineum* from Malayan bats. Specimens of different body size. Note: Relatively longer lunulibody in larger specimens; suckers and pharynx relatively much larger in small specimens.

the oral sucker, 0.55 for the pharynx, 0.60 for the acetabulum, 0.62 for the testes, and 0.67 for the ovary. All organs have a strongly negative allometric growth, i.e., they grow much more slowly than the whole body (allometric exponent smaller than 1).

Figure 9 shows that the other difference among the three "species," i.e., a relatively longer hindbody in the larger forms, is due to positive allometric growth of the hindbody. In specimens of about 2 mm length, the acetabulum is located at the end of the anterior half of the body (as in *A. philippinorum*), while in larger specimens it is found in the anterior third of the body (as in *A. congolense* and *A. sanguineum*). There are intermediate stages between the various forms.

It can, of course, not be completely excluded that certain species differ only in their body size. This, however, can be expected only in a very small number of cases. The establishment of a species should be based on different body size alone only, if infection and cross-breeding experiments show that it is reproductively isolated from the related species (compare Rohde, 1959).

If a population is different in size to a described species and if intermediate forms are missing, it is at present difficult to decide whether it is conspecific with the known species, especially if there are considerable differences in the proportions of the body and the relative size of various organs. To make such a decision possible, it would be useful to know the allometric exponents for many organs in many species. Using these, allometric trends in various groups of helminths could be formulated quantitatively. Extrapolation would show whether a population belongs to a known species or not.

The examination of 13 species of trematodes belonging to nine monogenetic and digenetic families, showed that allometric trends can actually be demonstrated. Thus, in all species examined (*Platynosomum fastosum* Kossack

1910 (see Fig. 10), *Zonorchis* sp. (Dicrocoeliidae), *Mesococlium* sp. (Mesococliidae), *Diaschistorchis multitesticularis* Rohde, 1962 (Pronocephalidae), *Maxbraunium baeri* Rohde, 1964 (*Odeningotrema hypergenitalis* Rohde,

1962 (see Fig. 11), *Noctrema nycticebi* Rohde, 1962 (Lacithodendriidae), *Renschotrema malayi* Rohde, 1964 (Microphallidae), *Kaurma intermedia* Rohde, 1963 (Plagiorchidae), *Paroricentodiscus magnus* Rohde, 1962 (Paramphistomidae), *Opisthorchis viverrini* Poirier, 1886 (Opisthorchidae), *Polystomoides malayi* Rohde, 1963, and *P. renschi* Rohde, 1965 (Polystomatidae) the suckers and pharynx (if present) have a strongly negative allometric growth. In the first three species which are characterized by the presence of a very well developed uterus in the posterior part of the body, the hindbody has a strongly positive allometric growth.

In descriptions, measurements of specimens of different body size should be given separately, in order to render possible the calculation of allometric exponents. It is not sufficient to give average sizes and the range of measurements only. These data would also be of great value in studies of speciation and evolution of helminths.

It should also be noted that for diagnostic purposes, data like ratios of sucker body size or size of suckers and pharynx can be used only in connection with the absolute body size.

FROM ROHDE (1966)

ANCHITREMA

LOOSE LEAF ORGANIZER

SCHEDULE

PERIOD OR TIME									
COURSE MON. INSTRUCTOR									
COURSE TUE. INSTRUCTOR									
COURSE WED. INSTRUCTOR									
COURSE THU. INSTRUCTOR									
COURSE FRI. INSTRUCTOR									
COURSE SAT. INSTRUCTOR									

NAME _____

ADDRESS _____

SCHOOL _____ **TELEPHONE** _____

Athesmiini ~~n. trib.~~ YAMAGUTI, 1958

Tribe diagnosis. — Dicrocoeliidae, Dicrocoeliinae: Body fusiform, lanceolate or slender. Oral sucker small, or moderately large; esophagus short, ceca terminating at varying distances from posterior extremity. Acetabulum comparatively small, subequal to oral sucker, close to anterior extremity, or separated from it about one third of body length. Testes tandem, diagonal, or juxtaposed. Genital pore bifurcal or post-bifurcal. Ovary submedian, in middle third of body. Vitellaria unilateral, exceptionally bilateral, postovarian. Uterus occupying most of hindbody. Excretory vesicle tubular, long.

Key to genera of Athesmiini

Body lanceolate to fusiform; acetabulum about one third of body

- length from anterior extremity; vitellaria limited in extent**
..... *Pseudathesmia*
Body slender; acetabulum close to anterior extremity; vitellaria
more extensive *Athesmia*

Key to genera of Athesmini

- Lateral margin of hindbody serrate; vitellaria confined to posterior part of body *Unilaterilecithum*
Lateral margin of hindbody not serrate; vitellaria not confined to posterior part of body *Athesmia*

Athesmia Looss, 1899

Syn. *Lyperotrema* Travassos, 1919

Hepatotrema Stunkard, 1923

Generic diagnosis: — *Dicrocoeliidae*, *Dicrocoeliinae*, *Athesmini*: Body slender, flattened, smooth. Suckers close to each other acetabulum comparatively small. Oral sucker terminal or subterminal, small or moderately large, pharynx small, esophagus short, ceca terminating at varying distances from posterior extremity. Testes tandem or slightly diagonal, in anterior half of body. Cirrus pouch claviform, pre-acetabular. Genital pore bifurcal or postbifurcal. Ovary submedian, in middle third of body. Receptaculum seminis and Laurer's canal present. Vitellaria postovarian, extending on one side only along cecum, may be partly intercecal. Uterus winding in intercecal as well as postcecal area of hindbody; eggs small. Excretory vesicle tubular, long, somewhat undulating. Parasitic in bile ducts and bladder of birds and mammals.

Genotype: *A. heterolecithodes* (Braun, 1899) Looss, 1899 Pl. 76,

Fig. 922), in *Porphyrio porphyrio*, *Gallinula chlorops*, *Phyllopezus africanus*, *Himantopus himantopus*; Madagascar, Egypt, Europe.

Other species from avian hosts:

- A. rudecta* (Braun, 1901) Travassos, 1941, syn. *A. attilae* Trav., 1917; *A. pricei* McIntosh, 1937; *A. butensis* Petri, 1942, in *Harpiprion caerulescens*, *Milvago chimachima chimachima*, *Psophia viridis viridis*, *Eurypyga helias*, *Cariama cristata*, *Jacana spinosa jacana*, *Guira guira*, *Speotyto cunicularia grillaria*, *Attila rufus*, *Buteo galapagoensis*; Brazil, Galapagos.
A. reelfooti Denton in Petri, 1942,¹⁾ in *Gallinula chloropus cachinans*; Reelfoot Lake; Tenn.
A. wehri McIntosh, 1937, in *Pediocetes phasianellus campestris*; Montana, U.S.A.

¹⁾ Denton, J. F. 1941. Studies on the morphology, taxonomy and life histories of trematodes of the subfamily Dicrocoeliinae Looss, 1899. Typewritten, not published.

Representatives from mammals:

- A. foxi* Goldberger et Crane, 1911 (Pl. 92, Fig. 1108), syn. *Hepatotrema cebi* Stunkard, 1923, in *Cebus capucinus* and *C. apella*; South America.
A. parkeri Pérez Viguera, 1942, in intestine (?) of *Artibeus jamaicensis parvipes*; Cuba.

SYN: *Pseudathesmia* Travassos, 1942

Generic diagnosis. — Dicrocoeliidae, Dicrocoeliinae, Athesmiini: Body flattened lanceolate to fusiform. Oral sucker subterminal, followed by pharynx. Esophagus rather short, ceca terminating at a considerable distance from posterior extremity. Acetabulum subequal to oral sucker, about one third of body length from anterior extremity. Testes diagonal and juxtapsed, postacetabular. Cirrus pouch entirely pre-acetabular, enclosing convoluted seminal vesicle. Genital pore just postbifurcal. Ovary submedian, in middle third of body. Receptaculum seminis small. Vitelline follicles small, unilateral, posterior to ovary on its opposite side, limited in extent, sometimes intercecal, sometimes extracecal for most part, exceptionally bilateral. Uterine coils mainly in inter- and postcecal field of hindbody; eggs small. Excretory vesicle tubular, long; pore terminal. Parasitic in bile ducts and gall bladder of mammals.

Genotype: *P. paradoxa* Travassos, 1942 (Pl. 91, Fig. 1098), in *Cerdocyon* *us*; Brazil.

On the synonymy of Pseudathesmia with Athesmia

Discussion

The so-called "diagnostic" characters of the genus *Pseudathesmia* Travassos 1942, like the relatively long esophagus, the relatively short intestinal ceca terminating before posterior fourth of body, the shape of testes, the position of testes in relation to ventral sucker, the shape of ovary, the position of ovary, the disposition of vitelline glands, the disposition of uterus and finally the habitat, are so fluctuating and in common with that of *Athesmia* Looss 1899, that there seems no justification for the separate entity of the two genera. It is, therefore, suggested that the genus *Pseudathesmia* should be considered as a synonym of *Athesmia* and the corresponding emendments be incorporated. Consequently, *Pseudathesmia paradoxa* Travassos 1942 — the type species — becomes *Athesmia paradoxa* (Travassos 1942). As pointed out by Travassos 1944, and Faust 1967, *A. parkeri* (Perez-Vigueras 1942), from the intestine (?) of a Cuban bat, *Artibeus jamaicensis parvipes*, might be a synonym of *A. paradoxa* (Travassos) and not an independent species as treated by Yamaguti 1958.

Looss (1899) established the genus *Athesmia* for an avian trematode, *Distomum heterolecithodes* (Braun 1899), from the hepatic ducts of *Porphyrio porphyrio* which had been

brought from Madagascar and died in Germany. Jacoby 1899, discovered the specimens of *A. heterolecithodes* (Braun) Looss 1899, from the liver of *Gallinula chloropus* in East Prussia. Odhner (1910) made another record from the hepatic ducts of *Himantopus candidus* and *Parra africana*, in Egypt and White Nile. GINETSINSKAIA (1952) added a new host *Falco atra*, in Astrakhan, USSR. MYERS, WOLFGANG and KUNTZ (1960) registered still another host, *Ptolostomus afer*, in Sudan. So far, the species has been reported only from the Old World.

In the New World, DENTON and BYRD (1951) described specimens of *Athesmia heterolecithodes* from the liver of *Gallinula chloropus cachinnans*, in Tennessee, U. S. A. LUMSDEN and ZISCHKE (1963) recovered the species from the same host as well as from *Rallus elegans*, in Louisiana, and reduced it to the synonymy of *A. jollieii* Schell 1957, parasitic of *Falco sparverius*, in Idaho. BYRD, PRESTWOOD, KELLOGG and HEARD (1967) obtained the examples of *A. heterolecithodes* from the bile duct and gall bladder of the wild turkey, *Meleagris gallopavo silvestris*, the ruffed grouse, *Bonasa umbellus umbellus*, and the clapper rail, *Rallus longirostris*, in southeastern part of the United States. The species was also found in the spotted tinamou, *Nothura maculosa* and *N. darwini*, which came from widely separated localities in Argentina; after studying the types, paratypes and "additional" specimens of *A. heterolecithodes* Denton and Byrd 1951, *A. wehri* McIntosh 1937, and *A. jollieii*, they agreed with FREITAS 1962, about the monotypic status of the genus *Athesmia*.

McINTOSH (1937) reported *Athesmia wehri* from the liver of *Pedioncetes phasianellus campestris*, in Montana, U.S.A., and also advanced a key for the identification of species in genus *Athesmia*. On the basis of characters employed by McIntosh, namely, the location of ovary in relation to anterior extremity, the extent of vitelline glands in relation to the distance between ovary and ventral sucker; the posterior terminations of intestinal ceca in relation to the posterior end of vitelline glands, the shape of testes (entire, slightly lobed or deeply lobed), the size of testes (smaller or larger than ovary), and the shape of ovary (entire or lobed), we consider the following valid species of *Athesmia*:

1. *A. heterolecithodes* (Braun 1899) Looss 1899.
Syn. *A. jollieii* Schell (1957) after Lumsden and Zischke 1963.
A. reelfooti Denton in Petri (1942) after Denton and Byrd 1951.
2. *A. fozi* Goldberger and Crane (1911) Caballero, Grocott and Zerecero (1953) Faust (1967) Freitas (1962) Lee (1965) Mirolyubov (1962) Stunkard (1923) Travassos (1942, 1944).
Syn. *Hepatotrema cebi* (Stunkard 1923) Stunkard 1923.
3. *A. kassimovi* Faizullaev 1961.
4. *A. paradoxa* (Travassos 1942).
Syn. *Pseudathesmia paradoxa* Travassos 1942.
Athesmia parkeri Perez-Vigueras 1942.
5. *A. pricei* McIntosh 1937.
6. *A. rudecta* (Braun 1901) Travassos 1941.
Syn. *A. attilae* Travassos (1917, 1942).
A. butensis Petri (1942) Travassos 1944.
(Lutz 1928, recorded *A. attilae* (?) from the bile ducts of *Parra jacana* and *Nettion brasiliense*, in Venezuela, but there are no details whatsoever for comparative purposes)

Dicrocoeliidae

ATHESMIA Looss

Body greatly enlongate, ribbon-like. Testes almost entirely behind one another separated by a space about equal to their length. Vitellaria asymmetrical, only on one side of the body (sometimes the right, sometimes the left). Descending and ascending coils of the uterus close together, overlapping somewhat in places. Type species: A. heterolecithodes (Braun)

A. heterolecithodea (Braun)

♂.-9. mm. by 1.5 to 2, mm.
Diameter of oral sucker 0.46 mm.
Diameter of acetabulum 0.37 mm.
Diameter of pharynx 0.096 mm.
Esophagus length.....0.39 to 0.58 mm.
Ceca not ending at equal levels
Eggs 31 to 40 by 19 to 23 μ

Hosts: Porphyrio porphyrio (Linn.)
Gallinula chloropus (Linn.)

from Luhe 1909

Lyperotrema Travassos, 1919 is a synonym
of Athesmia. See Travassos, 1941

Other species:

A. rudecta (Braun) Travassos, 1941
syn.: Lyperotrema rudectum (Braun)
Lyperosomum rudectum (Braun)
A. attilae Travassos, 1917
A. pricei McIntosh, 1937
A. wehri McIntosh, 1937
A. foxi (Goldberger & Crane, 1911)
A. reelfooti Denton, 19 ?
A. butensis Petri

Genus Athesmia

1. Ovary in anterior half of body; vitellarium longer than distance from ovary to acetabulum-----A. heterolecithodes (Braun)
 Ovary equatorial or approximately so; vitellarium shorter than distance from ovary to acetabulum-----2
2. Intestinal ceca terminating near or before reaching level of caudal extremity of vitellarium-----A. foxi (Goldberger and Crane)
 Intestinal ceca terminating some distance posterior to level of caudal extremity of vitellarium-----3
3. Testes oval or only slightly lobed; smaller than ovary--
 -----A. pricei Mc Intosh
 Testes deeply lobed; larger than ovary-----4
4. Ovary smooth-----A. atilae (Travassos)
 Ovary greatly lobulated-----A. wehri Mc Intosh

from Mc Intosh, 1937
 Proc. Hel. Soc. Wash., 4: 23

1. *Athesmia heterolecithodes* (Braun 1899) Looss 1899

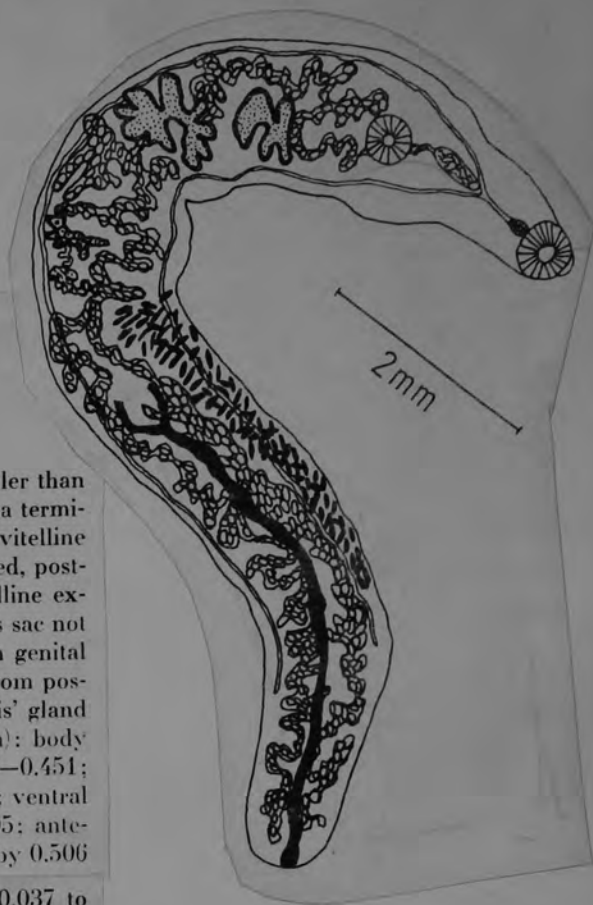
(Fig. 1)

Host: *Cerdocyon thous* (L.).

Location: Liver.

Locality: San Juan de Los Morros, Edo. Guárico, Venezuela.

Description: Prepharynx absent. Ventral sucker only slightly smaller than oral sucker. Pharynx present. Esophagus relatively short. Intestinal ceca terminating at a considerable distance posterior to posterior limits of vitelline glands. Testes larger than ovary, variously lobed. Ovary variously lobed, post-testicular, pre-equatorial. Vitelline glands unilateral, postovarian; vitelline extent greater than the distance between ovary and ventral sucker. Cirrus sac not extending to ventral sucker, enclosing coiled seminal vesicle. Common genital pore postbifurcal. Uterus characteristically arranged, extending right from posterior end of body to ventral sucker. Receptaculum seminis and Mehlis' gland posterior to ovary. Excretory vesicle tubular. Measurements (in mm): body 9.691–12.167 by 1.155–1.580; oral sucker 0.385–0.573 by 0.407–0.451; pharynx 0.099–0.154 in diameter; esophagus 0.264–0.459 in length; ventral sucker 0.385–0.407 in diameter; ovary 0.253–0.352 by 0.440–0.605; anterior testis 0.363–0.704 by 0.407–0.682; posterior testis 0.385–0.793 by 0.506 to 0.746; cirrus sac 0.407–0.539 by 0.121–0.143; intrauterine eggs 0.037 to 0.045 by 0.022–0.025; vitelline extent 2.739–3.399; distance of ovary from anterior end of body 3.861–5.379; distance of ovary from posterior end of body 5.577–6.445; distance of ovary from ventral sucker 2.178–3.135; distance of anterior testis from ventral sucker, from nil to 0.660.



FROM NASIR, ARCAY DE PERAZA AND DÍAZ, 1969
Zool. ANZ. 152: 224-230

FIGURE 36, f

Distomum heterolecithodes BRAUN, Zool. Anz., vol. 22, p. 3, 1899.

Athesmia reelfooti DENTON, in Petri, Trans. Amer. Micr. Soc., vol. 61, p. 60, 1942.

A single mature specimen belonging to the genus *Athesmia* was dissected from the liver of a Florida gallinule, *Gallinula chloropus cachinnans* Bangs, collected at Reelfoot Lake, Tenn. It is possible to assign this material to *A. heterolecithodes* (Braun, 1899), although our specimen differs somewhat from this species as redescribed by Jacoby (1899a, b) in having a narrower and longer body, relatively shorter ceca, more posterior genital pore, and a smaller cirrus pouch.

HELMINTH PARASITES OF BIRDS—DENTON AND BYRD 183

The differences noted, except possibly the difference in the size of the cirrus pouch, can be attributed to a difference in the state of body contractions. Since this is the first time *A. heterolecithodes* has been reported from the New World, a detailed description of the specimen is given below.

Description.—Body slender and semitransparent, approximately 11.4 mm. long by 0.69 mm. wide at level of acetabulum; sides almost parallel. Cuticle thin, without spines. Oral suckers subterminal, 0.44 mm. long by 0.43 mm. wide. Acetabulum smaller, 0.36 mm. in diameter, situated about one-seventh of body length from anterior end. Pharynx 0.10 mm. in diameter. Esophagus narrow and straight, 0.39 mm. long, bifurcating about two-fifths the distance from oral sucker to acetabulum. Ceca slender, unequal in length, extending to about level of caudal extremity of vitellarium. Excretory pore terminal. Genital pore median, a short distance posterior to intestinal bifurcation. Anterior testis 0.51 mm. long by 0.26 mm. wide, irregular in outline, deeply fissured on lateral margins, situated toward same side of body as vitellarium. Posterior testis 0.52 mm. long by 0.26 mm. wide, of same shape as anterior testis, situated on opposite side of body, 0.87 mm. behind level of anterior testis. Cirrus sac pear-shaped, 0.24 mm. long by 0.14 mm. wide, containing coiled seminal vesicle and eversible cirrus. Ovary small, 0.16 mm. long by 0.27 mm. wide, deeply lobed, situated preequatorily on opposite side of body from vitellarium. Seminal receptacle large, globular, just posterior to ovary. Mehlis' gland at posteromedial margin of seminal receptacle. Vitellarium unilateral, consisting of numerous small follicles, divided into one large and two small groups, extending from level of Mehlis' gland through a distance of 3.43 mm. on right side of body. Uterus with many coils, descending first to posterior end of body, then ascending, passing to right of ovary and posterior testis, to left of anterior testis and dorsal to acetabulum and cirrus sac to genital pore. Mature ova dark brown, 33μ to 38μ long by 23μ to 25μ wide.

Additional host.—*Gallinula chloropus cachinnans* Bangs.

Habitat.—Liver.

Locality.—TENNESSEE: Reelfoot Lake.

Material.—The specimen has been deposited in the United States National Museum, Helm. Coll. No. 36732.



From Denton
& Byrd, 1951

Braun used "heterolecithodes"

Athesmia heterolecithoides (BRAUN, 1899) LOOSS, 1899 (Figs. 42 and 43)

Hosts: *Gallinula chloropus cachinnans* Bangs, Florida gallinule, and *Rallus elegans* Audubon, king rail (new host record).

Location: Liver.

Locality: Bonnet Carre Spillway and Lake Penchant, Louisiana (new locality record).

Discussion. DENTON and BYRD (1951) described a single specimen of *Athesmia* recovered from a Florida gallinule collected at Reelfoot Lake, Tennessee. These investigators noted that their specimen differed from *A. heterolecithoides* (Braun, 1899), from birds in Europe, Egypt and Madagascar, in body length, length of the ceca, position of the genital pore and size of the cirrus pouch. No significance was placed on these differences and the worm was identified as *A. heterolecithoides*. This specimen was referred to by PETRI (1942) as *A. reelfooti* Denton. McINTOSH (1937) named and described *A. wehri* from *Pedioecetes phasianellus* in Montana. *A. wehri* differs from *A. heterolecithoides* in the position of the ovary (equatorial in *A. wehri*, more anterior in *A. heterolecithoides*) and length of the vitellarium (shorter in *A. wehri*). One other form, *A. jolliei* Schell, 1957, from *Falco sparverius* in Idaho, has been reported from North America. SCHELL (1957) differentiated *A. jolliei* from previously described species of *Athesmia* on the basis of overall size (length and width $\frac{1}{2}$ that of other species of *Athesmia*), a relatively larger acetabulum ($\frac{2}{3}$ to $\frac{3}{4}$ the body width) and proportionately smaller and only slightly lobed testes. SCHELL'S (1957) material

also differs from *A. heterolecithoides* in having the testes positioned slightly diagonally rather than directly in tandem.

A. jolliei otherwise resembles *A. heterolecithoides* in the preequatorial position of the ovary and by possessing a vitellarium longer than the distance between the ovary and acetabulum.

TRAVASSOS (1944) noted considerable variation in size and shape of the gonads in *A. rudecta* (Braun, 1901) TRAVASSOS, 1941. Variation with respect to size and degree of lobation of the gonads is also apparent in our material from *Rallus elegans* and *Gallinula chloropus* collected in Louisiana. Within single specimens the anterior testis may be lobate while the posterior testis is nearly smooth margined or *vice-versa*. In one specimen from a gallinule, the posterior testis is represented only by a diffuse group of cells. In our series of *Athesmia* from *Rallus elegans* and *Gallinula chloropus* the testes normally have their greatest dimension along the longitudinal axis and are arranged in tandem, though in some specimens, in which the testes are of subnormal size, the testes are transversely elongate and positioned obliquely. Certain size relationships, such as sucker ratio, diameter of the acetabulum: body width, and relative sizes of the gonads were seen to vary between worms recovered from the same individual host. Variation in distribution of the vitellaria, normally entirely unilateral, was observed. In one specimen recovered from *Gallinula chloropus*, the anterior-most vitelline follicles are positioned mesially and sinistrally, while the posterior $\frac{2}{3}$ of the vitellarium is confined to the right side of the body. This worm (Fig. 40) appeared identical in all other respects with specimens which we have identified as *A. heterolecithoides* recovered from the same gallinule. While the possibility of mixed infections with two or more natural species cannot be absolutely discounted, we prefer to regard this morphological variation as intraspecific at this time. For this reason, *A. jolliei* Schell, 1957, *A. heterolecithoides* (BRAUN, 1899) of DENTON and BYRD, 1951, and our material from *Rallus elegans* and *Gallinula chloropus* in Louisiana are considered conspecific, and tentatively assigned to *A. heterolecithoides* (BRAUN, 1899).



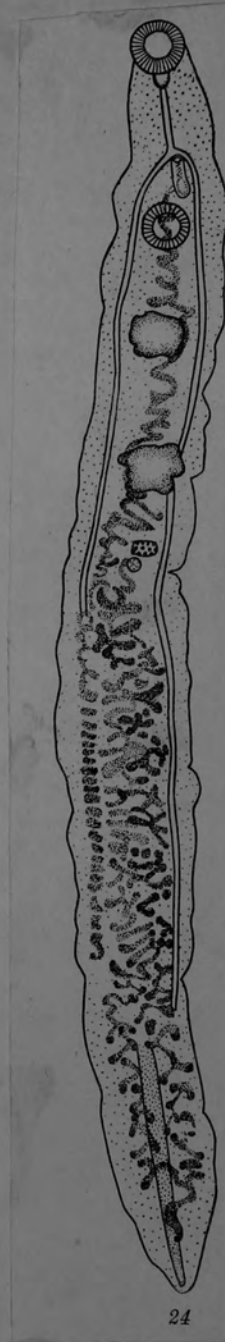
from
Lumsden & Zischke, 1963

Table 4. Comparative measurements of *Athesmia heterolecithoides*

Host	<i>Gallinula chloropus</i>	<i>Falco sparverius</i>	<i>Porphyrio porphyrio</i> , <i>Gallinula chloropus</i> , <i>Phyllopezus africanus</i> , <i>Himantopus himantopus</i>	<i>Rallus elegans</i>	<i>Gallinula chloropus</i>
Locality	Tennessee	Idaho	Europe, Madagascar, Egypt	Louisiana	Louisiana
Authority	DENTON & BYRD (1951)	SHELL (1957)	TRAVASSOS (1944)	This paper	This paper
total length	11.4	3.80—4.60	8.0—9.0	8.142—11.788	7.257—13.452
width	0.69	0.20—0.30	1.5—2.0	0.531—0.991	0.531—0.779
oral sucker	0.44 × 0.43	0.21—0.23 × 0.15—0.20	0.460 dia.	0.281—0.384 × 0.281—0.396	0.320—0.396 × 0.320—0.358
pharynx	0.10 × 0.10	0.07 (wide)	0.09 dia.	0.089—0.128 × 0.102—0.155	0.076—0.102 × 0.072—0.089
acetabulum	0.36 × 0.36	0.16—0.17 × 0.16—0.17	0.370 dia.	0.307—0.396 dia	0.281—0.345 × 0.294—0.320
cirrus pouch	0.24 × 0.14	0.23 × 0.03	0.290—0.330 long	0.320—0.512 × 0.089—0.153	0.320—0.384 × 0.076—0.128
testes	0.51—0.52 × 0.26	0.16—0.20 × 0.05—0.06	0.350—0.400 dia.	0.256—0.779 × 0.140—0.601	0.332—0.991 × 0.256—0.531
ovary	0.16 × 0.26	0.12—0.15 dia.	0.150—0.170 × 0.360	0.166—0.354 × 0.166—0.384	0.177—0.512 × 0.281—0.354
eggs	0.033—0.038 × 0.023—0.025	0.025 × 0.016—0.018	0.030—0.040 × 0.019—0.023	0.028—0.041 × 0.014—0.022	0.031—0.041 × 0.017—0.022
body width: transverse dia acetabulum	1:0.50	1:0.66—0.75	1:0.18—0.25	1:0.37—0.55	1:0.41—0.60
preovarian body length: total body length	—	—	—	1:2.0—2.5	1:2.0—2.6
sucker ratio	1:0.81	—	1:0.80	1:0.92—1.04	1:0.87—0.97

Athesmia heterolecithodes (Braun, 1899) Looss, 1899

Host: Porphyrio porphyrio
Gallinula chloropus



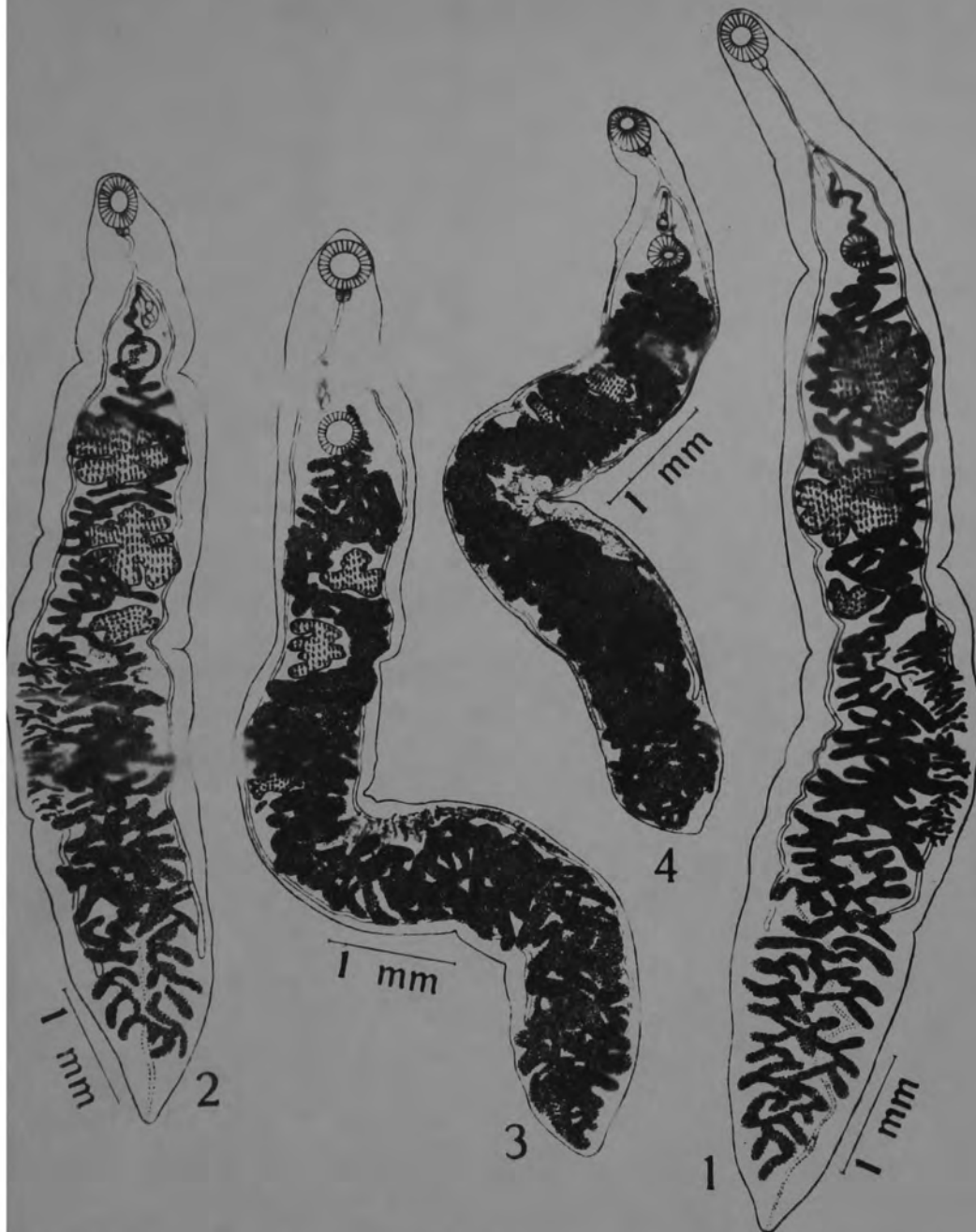
TEIXEIRA DE FREITAS (1962 - SEE REPRINT)

SEEMS TO SUGGEST THAT *A. HETEROLECITHODES*
HAS THE FOLLOWING SYNONYMS:

<i>A. ATTILAE</i>	<i>A. JOLLIEI</i>	<i>A. RUDECTA</i>
<i>A. BUTENSIS</i>	<i>A. PARKERI</i>	<i>A. WENRI</i>
<i>A. FOXI</i>	<i>A. PRICEI</i>	

ARQUIVOS DO MUSEU NACIONAL — VOL. LII — 1962

91



Athesmia heterolecithodes (Braun, 1899), total — Figs. 1-2: Espécimes parasitos de *Chiropotes albinasa* (L. Geoff. & Dev.) (Coleção Helminológica do Instituto Oswaldo Cruz números 26 968a e 26 968b, respectivamente); figs. 3-4: espécimes parasitos de *Procyon cancrivorus* Cuv. (Coleção Helminológica do Instituto Oswaldo Cruz números 17 500 e 17 503, respectivamente).
Figuras originais

Dicrocoeliidae

Athesmia attilae Travassos, 1917

3.5 to 4 by 0.4 to 0.5
Oral sucker 0.20 to 0.26
Acetabulum 0.17 to 0.24

Genital pore at bifurcation
Pharynx about 0.071 in diameter
Esophagus 0.15 long ; ceca to near end of body.

Testes with irregular contour, more or less tandem.
Ovary transversely ellipsoidal, intercecal, equatorial
or postequatorial.
Vitellaria postovarian, postequatorial, about 0.5 long.
Eggs 28 to 30 by 14 to 17 μ

Host: Atilla cinerea (a bird)
in bile ducts

Locality: Brazil

Reference: Brazil Medico, 31:149. 1917



Athesmia butensis n. sp. *Petri, 1942*
(Figs. 2-4)

Host: *Buteo galapoensis* (Gould), galapagos hawk.

Location: Intestine.

Locality: Galapagos Islands.

Number: Three taken from one host.

Specific diagnosis. Body smooth, elongate, tapering toward the ends. Length 7.3 mm.; maximum width (at posterior level of posterior testis) 0.77 mm. Oral sucker subterminal, slightly longer than wide, 0.216 mm. in transverse diameter. Acetabulum circular, musculature weaker than that of the oral sucker, 0.211 to 0.216 mm. in diameter. Pharynx 0.081 to 0.309 by 0.085 to 0.370 mm.; esophagus narrow, about 0.185 to 0.215 mm. long; ceca narrow, extending to at least $\frac{3}{4}$ the body length. (The exact termination of the ceca was impossible to determine due to the thick coils of the uterus.)

Testes tandem, irregular in outline and deeply lobed laterally. Anterior testis 0.231 by 0.247 to 0.385 mm. Posterior testis 0.231 by 0.354 to 0.570 mm. separated from the anterior testis by a distance slightly less than the longitudinal axis of the posterior testis. Genital pore median at about the level of the intestinal bifurcation. Cirrus sac cylindrical, 0.060 by 0.225 mm., entirely preacetabular.

Ovary (Figs. 3, 4) more or less oval in outline, slightly lobed in type specimen; 0.123 to 0.124 by 0.277 to 0.278 mm. Rather large seminal receptacle present just posterior to ovary; 0.107 to 0.200 by 0.067 to 0.081 mm. Vitellaria unilateral, consisting of numerous groups of follicles, beginning at the posterior level of the ovary and extending posteriorly a distance of about 0.770 to 2 mm. A portion of the vitelline duct could be observed running from the anterior region of the vitellaria toward the region of the ootype. Eggs numerous, 37 to 42 μ in length by 21 to 25 μ in width, average about 41 by 23 μ .

The excretory pore is terminal.

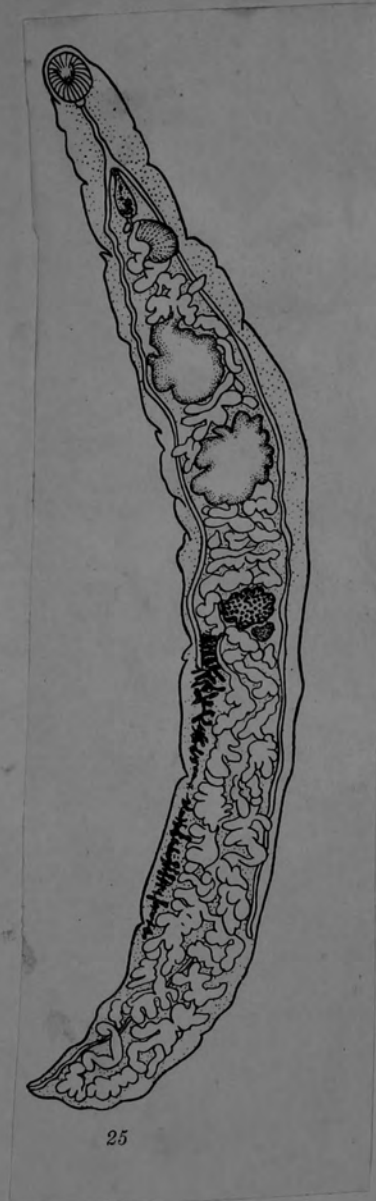
Comparisons. This species seems to differ from *A. rudecta* (Braun, 1901) Travassos, 1941, and *A. attilae* Travassos, 1917, from Brazil only in its larger eggs (37 to 42 μ by 21 to 25 μ as compared with 28 to 30 μ by 14 to 17 μ). The fact that the type specimen had a lobed ovary and another an unlobed ovary (compare Figs. 3 and 4) makes it seem probable that *A. attilae* is a synonym of *A. rudecta*. However, a comparison of numerous specimens is needed to settle this question. *A. butensis* differs from *A. wehri* McIntosh, 1937, in sucker ratio, in more slender body and in larger eggs. *A. butensis* differs from *A. reelfooti* Denton (in press) in that *A. reelfooti* has a narrower body, wider cirrus sac, smaller eggs, smaller pharynx in

proportion to the oral sucker, esophagus longer in proportion to the pharynx and gonads farther apart.

A species of *Eurytrema* collected from *Zamelodia ludoviciana* (rose-breasted grosbeak) proved identical with a new species being named by Denton (in press). Denton collected it from *Cyanocitta cristata*, *Melanerpes erythrocephalus* and *Richmondia cardinalis magirostris*.

Athesmia foxi Glodberger & Crane, 1911

Host: Cebus capucinus
Callicebus calligatus



Род *Pseudathesmia* Travassos, 1942

Диагноз рода (по Травассосу, 1942)

Dicrocoeliinae. Тело плоское, веретеновидное. Кутикула с очень мелкими, трудно различимыми сосочками. Присоски слабо развиты, лежат в передней трети тела. За ротовой присоской следует фаринга. Пищевод относительно длинный. Кишечные стволы тонкие, сравнительно прямые и короткие, обычно оканчивающиеся впереди задней четверти тела. Половое отверстие располагается медианно, сейчас же позади бифуркации пищевода. Половая бурса лежит впереди брюшной присоски, содержит циррус, простатическую часть и скрученный семенной пузырек. Семенники расположены либо наискось, либо на одном горизонтальном уровне, непосредственно позади брюшной присоски. Семенники лопастные или неправильно овальной формы. Яичник более или менее лопастной, лежит позади семенников, сдвинут в сторону от медианной линии. Тельце Мелиса находится позади яичника, не всегда хорошо заметное. Семяприемник маленький, лежит обычно между яичником и тельцем Мелиса. Желточники располагаются на одной стороне тела, позади яичника, и состоят из мелких фолликулов, расположенных в интрацекальной и цекальной зонах; отдельные фолликулы иногда лежат экстрацекально. Матка с поперечными петлями. Поперечные петли матки не пересекают кишечные стволы. Терминальная ее ветвь образует группу петель рядом с яичником, после чего проходит между семенниками, образуя маленькую группу петель между ними и брюшной присоской, после чего направляется дорзально от брюшной присоски к половому отверстию. Яйца с темной оболочкой и крышечками, не содержат сформированного мирацидия. Экскреторное отверстие терминальное. Экскреторный пузырек тонкий, трубчатый, оканчивается на уровне зоны желточников.

Паразиты желчного пузыря и желчных протоков млекопитающих семейства *Canidae*.

Типичный и пока единственный вид: *Pseudathesmia paradoxa* Travassos, 1942.

ATHESMIA PARADOXA (TRAVASSOS, 1942) NASIR, ARCAN DE PERAZA AND DIAZ, 1969

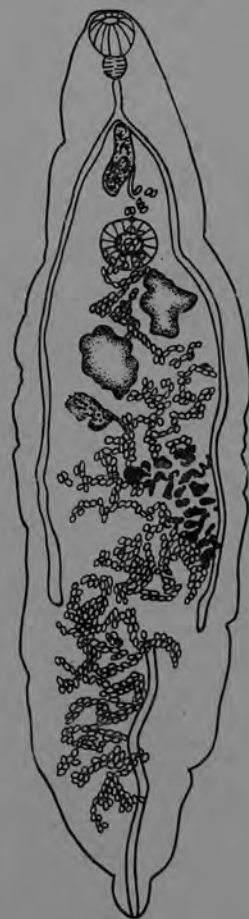
SYN. *Pseudathesmia paradoxa* Travassos, 1942

(Рис. 194)

Хозяин: азаровая лисица (*Cerdocyon thous*).

Локализация: желчные протоки печени.

Место обнаружения: Бразилия.



Athesmia parkeri Viguera, 1942

Host: Artibeus jamaicensis parvipes

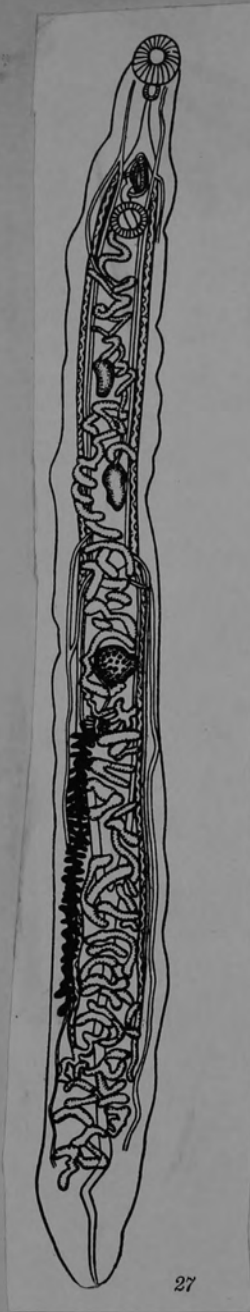


Body slender 8 long by 700 μ wide and 140 μ thick; cuticle without spines. Oral sucker 320 μ by 270 μ with subterminal opening; acetabulum 230 μ in diameter, situated about 1/7 of body length from anterior end. Pharynx 100 μ in diameter; esophagus 300 μ long, forking about midway between the suckers; intestinal ceca slender, simple, unequal in length, extending posteriorly to level of caudal extremity of vitellarium. Excretory system, as far as could be observed, similar to that of *Athesmia wehri*. Anterior testis 230 μ by 130 μ , almost oval in outline, removed from acetabulum by a distance equal to that separating posterior testis and ovary; posterior testis 280 μ by 175 μ , similar in shape to anterior testis, and situated nearer to anterior testis than to ovary; cirrus sac about 280 μ by 120 μ , containing coiled seminal vesicle and cirrus with tip only of latter projecting thru the genital pore which is located immediately posterior to intestinal fork. Ovary oval or only slightly lobed, 240 μ by 280 μ , equatorial, seminal receptacle small, 100 μ by 130 μ , posterior and dorsal to ovary; Laurer's canal present; Mehlis' gland somewhat lateral, with lateral half immediately in front of the vitellarium. Vitellarium posterior to and on opposite side of body from ovary, the follicles extending thru an area 1.85 by 130 μ to 150 μ ; distance from posterior extremity of vitellarium to caudal end of body slightly less than length of vitellarium. Uterus with numerous coils, extending to within a short distance of the posterior end; descending portion crossing ascending portion in the posterior half of the body 3 to 4 times. Ascending portion returning in space not occupied by descending portion as far as level of ovary, passing between ovary and vitellarium, then continuing between the testes and dorsal of the acetabulum and cirrus sac to genital pore. Eggs 32 μ by 19 μ from light lemon to dark brown in color.

Habitat: Liver of *Psophia viridis* Spix

Locality: National Zoological Park, Washington, D. C.





A. pricei

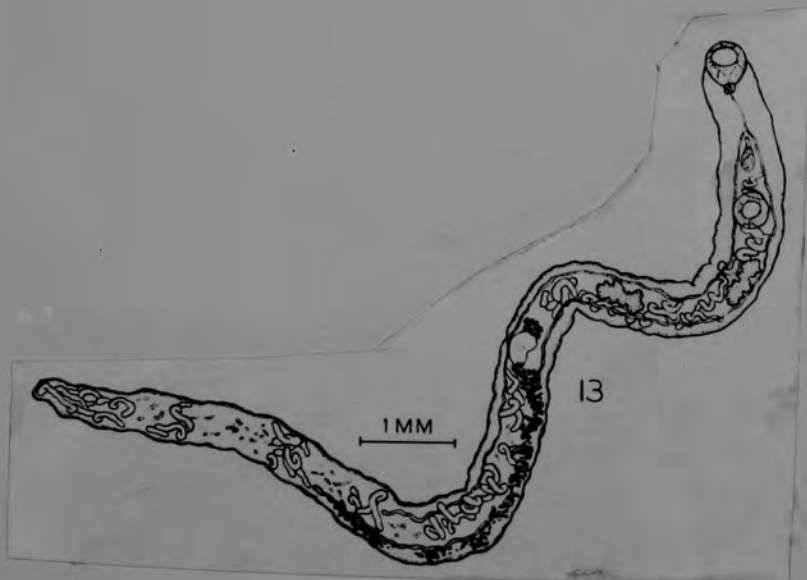
Athesmia reelfooti Denton in press

11.4 by 0.69. Unspined.
Oral sucker 0.443 long by 0.428 wide
Acetabulum 0.360; 1/7 from anterior end
Pharynx 0.100 in diameter
Esophagus 0.39 long bifurcating about 1/3 distance between
suckers.
Ceca unequal in length, extending to about caudal end of
vitellarium
Genital pore a short distance posterior to bifurcation
Testes lobed.
Cirrus sac pear-shaped, 0.243 by 0.143.
Ovary deeply lobed, preequatorial, opposite side from vitellarium.
Vitellarium of numerous follicles divided into one large
group and two small groups; from level of Mehlis'
gland a distance of 3.43 on right side.
Eggs 33 to 38 by 23 to 25 μ

Host: Gallinula chloropus cachinnans
in liver

Locality: Tennessee

Reference; Denton U.S.Nat.Mus.



Athesmia rudecta (Braun, 1901) Travassos, 1941

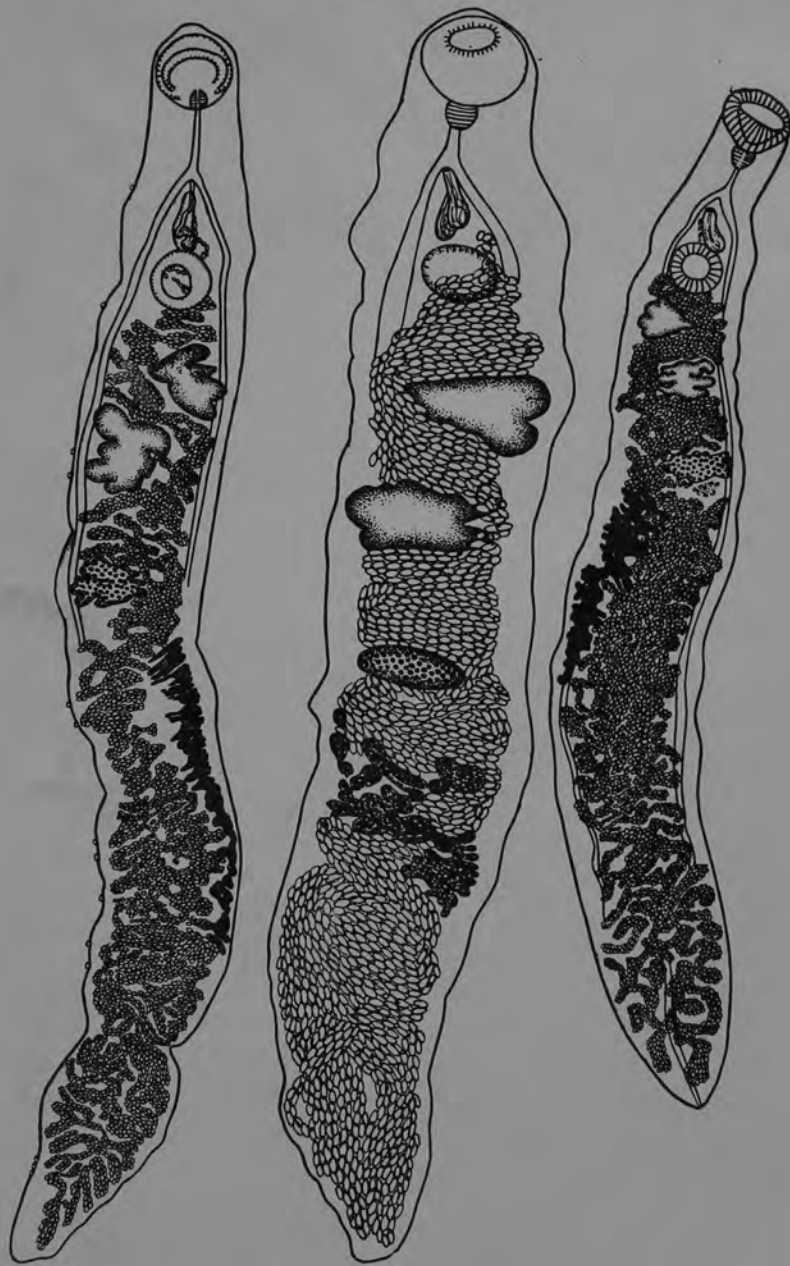
Синонимы: *Lyperosomum rudectum* Braun, 1901; *Athesmia atillae* Travassos, 1917; *Lyperotrema rudectum* (Braun, 1901) Travassos, 1919; *Athesmia* sp. Travassos, Freitas et Lent, 1939; *Athesmia butensis* Petri, 1942

(Рис. 28, 29)

Хозяева: птицы — *Harpiprion caerulescens* (Vieill.), *Milvago chimachima chimachima* (Vieill.), *Eurypyga helias* (Pallas); *Cariama cristata* (L.); *Jacana spinosa jacana* (L.); *Guira guira* (Gm.); *Speotyto cunicularia grallaria* (Temm.); *Attila rufus* (Vieill.); *Buteo galapagoensis* (Gould.).

Локализация: желчный пузырь и желчные протоки печени, кишечник.

Сем. DICROCOELIIDAE



2. *Athesmia rudecta* (Braun 1901) (*Dicrocoeliidae*, *Dicrocoeliinae*, *Athesmini*)

Synonyme: *Lyperosomum rudectum* Braun 1901, *Athesmia atillae* Travassos 1917, *A. bitensis* Petri 1942, *A. pricei* McIntosh 1937 (fide YAMAGUTI 1958).

Lokalisation: Leber, Gallengänge.

Intensität: Etwa 7 Exemplare (*Psophia* I), etwa 30 Exemplare (*Psophia* II).

Präparat-Nr.: KT 9 87-89, KT 10,32-37.

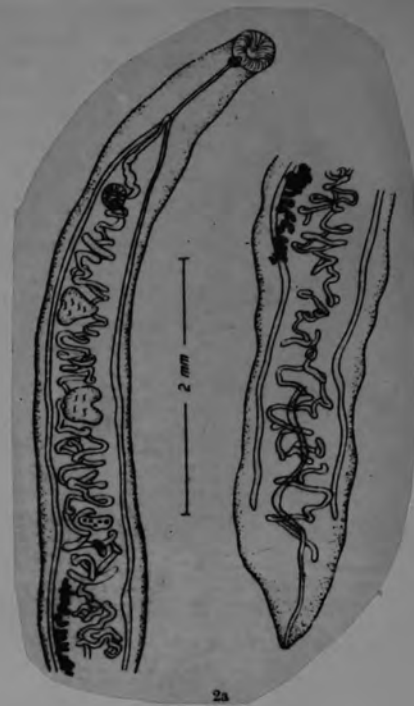
Beschreibung (vgl. Abb. 2 und Tab. 2): Körper sehr langgestreckt, vorn leicht verschmälert, 4,5-8,5 mm lang bei einer maximalen Breite von 0,4-0,8 mm. Cuticula glatt. Die Darmschenkel waren im Leben mit hellgrünem Inhalt angefüllt. Mund-

saugnapf etwa von gleicher Größe wie Bauchsaugnapf oder etwas kleiner oder größer. Mundsaugnapf parenchymatös, Pharynx und Bauchsaugnapf mit Tendenz zur Parenchymatisierung. Ovarium median oder submedian in der Körpermitte oder teilweise beträchtlich davor oder dahinter, meist kleiner als die Testes, unregelmäßig gestaltet, fast glattrandig bis gelappt oder gezackt. Testes median oder - manchmal alternierend - etwas submedian verschoben hintereinander gelegen, von unregelmäßiger Gestalt, gelappt, gezackt oder gekerbt. Receptaculum seminis submedian hinter dem Ovarium. Dotterstöcke hinter der Ovarialregion, einseitig entwickelt, vorn meist intercaecal beginnend, weiter hinten hauptsächlich caecal und extracaecal angeordnet. Eigroße 0,029-0,038-0,013-0,023 mm. Exkretionsblase I-förmig, sich vom Körperhinterende bis etwa zur Körpermitte erstreckend, oft leicht geschlängelt; Ansatzstücke ziemlich kurz. Ansatzmodus plagiorechoid. Teilungsfaktor 2'.

Athesmia rudecta (Braun), Maße der Präparate von 7 Exemplaren in mm

Körperlänge	7,0	7,5	5,278	8,356	4,926	5,864	6,817
Körperbreite	1,0	1,1	0,513	0,806	0,528	0,594	0,572
Mundsaugnapf							
Länge	0,359	0,323	0,249	0,169	0,198	0,183	0,176
Breite	0,323	0,352	0,191	0,198	0,169	0,191	0,154
Pharynx							
Länge	0,110	0,110	0,081	0,081	0,072	0,065	0,086
Breite	0,095	0,095	0,066	0,073	0,062	0,069	0,069
Bauchsaugnapf							
Länge	0,234	0,264	0,198	0,205	0,169	0,169	0,191
Breite	0,271	0,271	0,213	0,220	0,191	0,147	0,161
Eier							
Länge	0,029	0,030	0,030	0,030	0,030	0,030	0,029
Breite	-0,038	-0,036	-0,036	-0,034	-0,034	-0,036	-0,036
	0,014	0,013	0,018	0,018	0,018	0,018	0,018
	-0,018	-0,018	-0,020	-0,023	-0,023	-0,021	-0,021

From Odening, 1964



Athesmia rudecta (Braun, 1901) Travassos, 1941

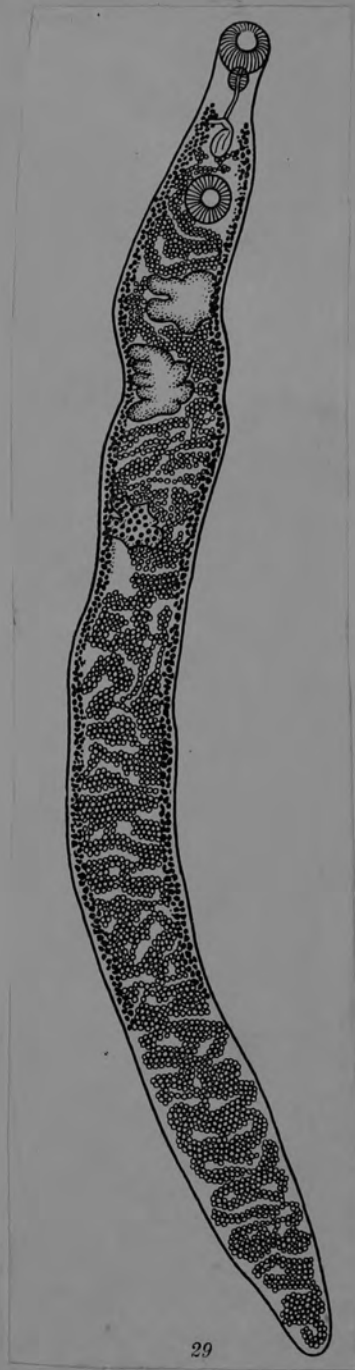
Syn.: Lyperosomum rudectum Braun, 1901
Lyperoderma rudectum (Braun) Travassos, 1919

Host: Ibis coerulescens; Brazil

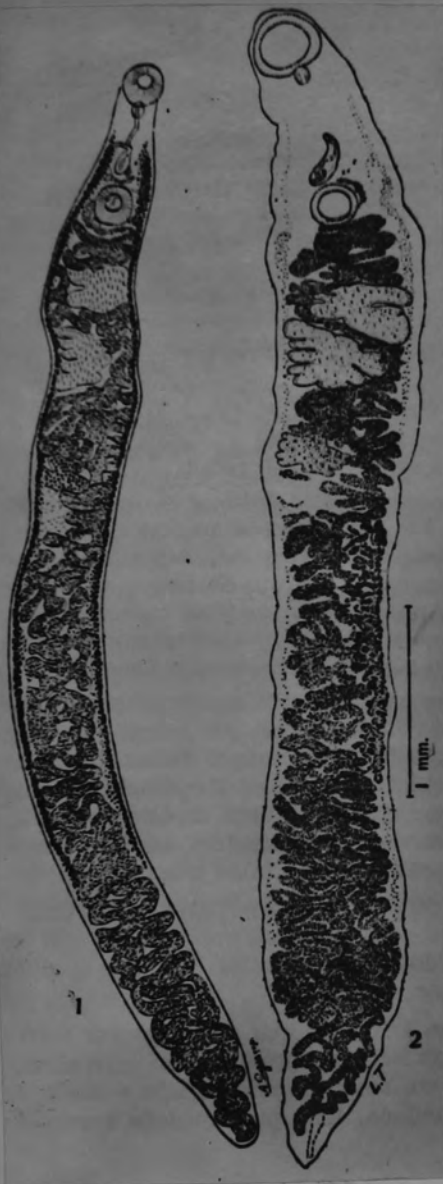
length 7. by 0.5 mm
ovary lobed

Eggs 28 by 14 to 18 u

Ref: Cent. Bakt., 29, p. 946



BRAUN, M. 1902. FASCIOLOIDEN
DER VÖGEL.
ZOOLOG. JAHRB. ABT.
SYST. 16 (3): 1-162
p. 151-8, figs. 1-99
Revised C.S.
Benny Hall
10/5/76.



From TRAVASSOS (1941) AFTER BRAUN (1901)

2. *Athesmia wehri* McIntosh 1937

Fig. 2)

Host: *Cebus albifrons* (Humboldt) and *C. nigrivittatus* Wagner.

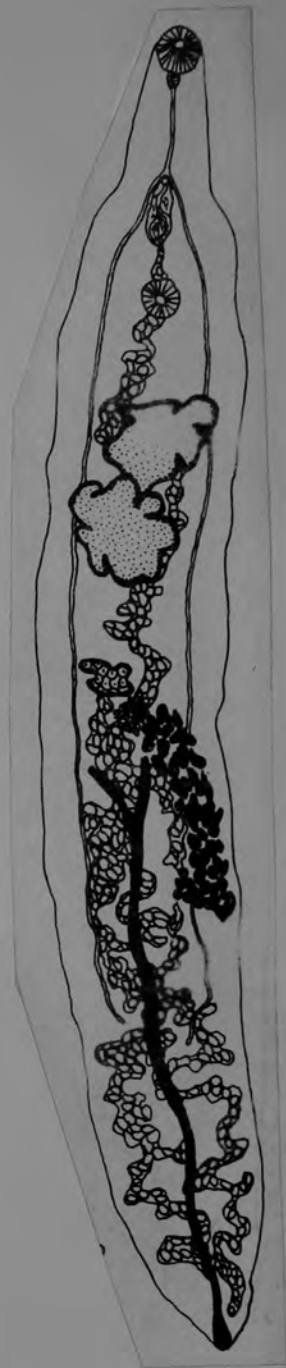
Location: Livers

Locality: El Pinar, Caracas, D. F. and distrito Mara, Edo, Zulia, Venezuela.

Description: Prepharynx absent. Pharynx small. Ventral sucker smaller than oral sucker. Esophagus relatively long. Intestinal caeca terminating at a variable distance posterior to posterior end of vitelline glands. Ovary variously lobed, posttesticular, equatorial or approximately so. Receptaculum seminis and Mehlis gland posterior to ovary. Testes variously lobed, larger than ovary. Uterus extending from posterior end of body to ventral sucker. Cirrus sac not extending to ventral sucker, enclosing coiled seminal vesicle. Common genital pore postbifurcal. Vitelline glands unilateral, postovarian. Vitelline extent smaller than the distance between ovary and ventral sucker. Excretory vesicle tubular. Measurements (in mm): body 11.385–12.045 by 1.416–1.749; oral sucker 0.385–0.462 by 0.374–0.385; pharynx 0.121–0.132 by 0.110–0.121; esophagus 0.847–0.902 long; ventral sucker 0.330–0.374 by 0.286–0.352; ovary 0.187–0.330 by 0.473–0.517; anterior testis 0.715–0.880 by 0.605 to 0.891; posterior testis 0.693–0.935 by 0.682–0.990; cirrus sac 0.495–0.647 by 0.176–0.220; intrauterine eggs 0.030–0.035 by 0.017–0.025; vitelline extent 1.650–2.112; distance of ovary from anterior end of body 5.570–6.501; distance of ovary from ventral sucker 2.937–3.762; distance of anterior testis from ventral sucker 0.175–0.730.

From NASIR, ARCAJ DE PERAZA AND DÍAZ, 1969

Zool. Anz. 192: 224–230



Athesmia wehri McIntosh, 1937

Length: 9.85

Width: 1.52

Oral sucker: 0.550 wide

Acetabulum: (size:) 0.420 wide
(position): width of body from anterior end

Sucker ratio: about 5:4

Esophagus: 0.300 long
Pharynx: 0.120 in diameter

Genital pore (location): median, immediately postbifurcal

Testes, shape: irregular in outline
location: anterior testis on same side as vitellaria
posterior testis filling intercecal width

Cirrus sac (extent): spindle shaped, 0.400 by 0.140

Ovary, shape: deeply lobed

location: equatorial and submedian

Vitellaria: extending through 2.6 mm., posterior to ovary

Eggs: 32 by 20 μ /

Other features: sem.red. relatively large

Host: Pedioectes phasianellus campestris Ridgway
sharp-tailed grouse

Locality: Miles City, Montana

Reference: Proc. Helm. Soc. Wash., 4: 21-22.

Comparisons:

Life cycle:





A. wehri

ATHESMIA