A NEW GENUS OF BLOOD FLUKES OF THE FAMILY SPIRORCHIDAE, FROM THE TORTOISE, *HARDELLA THURGI* (GRAY).

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The family Spirorchidae was erected by Stunkard (1921) to include the blood flukes from the turtles and originally contained only two genera—*Spirorchis* and *Hapalotrema*—which differ from each other in many features of their anatomy, and were placed in distinct sub-families, Spirorchinae and Hapalotreminae. The same year Stunkard had shown that *Spirorchis* MacCallum, 1918, and *Proparorchis* Ward, 1921, are synonymous thereby invalidating the family Proparorchidae as defined by the latter author. The bulk of the work on the family has been done by Stunkard, who in 1922 described two new genera, *Henotosoma* and *Hapalorhynchus*, one under each of the two sub-families, from North American turtles. The same author (1923), while reviewing the family Spirorchidae, described a new genus, *Haematotrema*, and several new species of the genus *Spirorchis*. Subsequently, he has considerably added to our knowledge of the family and has further described two new genera, *Vasotrema* and *Unicaecum*, from tortoises. Ejsmont (1927) added the genus, *Spirhapalum*, from the blood vessels of *Emys orbicularis* and erected the genus, *Diarmostorchis* for *Spirorchis blandingi* of MacCallum (1926), owing to the position of the ovary between the testes. Thapar (1933) described a new genus *Tremarhynchus*, from an Indian tortoise, *Trionyx gangeticus* and considered it to be a connecting link between the two known genera of the sub-family Hapalotreminae Stunkard, 1921. Mehra (1933) described two species of a new genus, *Coeuritrema*, from Allahabad and further discussed the relationships of the families of the blood flukes. The present communication deals with an account of another new genus of blood flukes from India, collected from the larger blood vessels of a tortoise *Hardella thurgi* (Gray).

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Gomtiotrema sanguina, gen. *et* sp. nov.

The parasite is a hermaphroditic distome, elongated and flattened in form (Text-fig. 1). It is widest in the region of the testes, gradually tapering towards the anterior end. The body is thin and transparent, 4·13 mm. in length and ·41 mm. in greatest breadth. The body is covered over with a thin cuticle which is devoid of any hooks or spines. This cuticle is inturned at the oral sucker, the genital pore and the excretory pore.

The oral sucker is situated at the extreme anterior end of the body and is protrusible. It is oval in shape, about one-half protruding out at the anterior end. It is slightly larger than the ventral sucker, ·125 mm. long by ·075 mm. broad. The ventral sucker is circular and also protrusible. It is situated at about one-third the distance from the anterior end of the body, its diameter is ·105 mm. The oral sucker

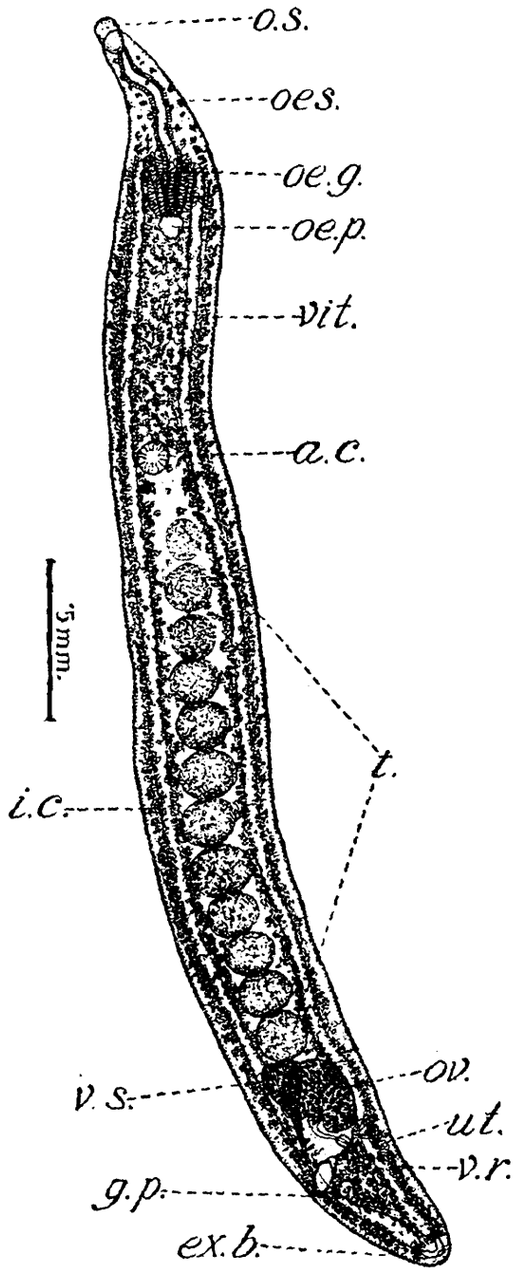

Fig. I.—*Gomtiotrema sanguina*, gen. *et* sp. nov. Dorsal view.

a. c.=acetabulum; *c. v. d.*=common vitelline duct; *e.*=egg; *ex. b.*=excretory bladder; *g. p.*=genital pore; *i. c.*=intestinal caeca; *l. c.*=Laurer's canal; *o. d.*=oviduct; *oes.*=oesophagus; *oe. g.*=oesophageal gland; *oe. p.*=oesophageal pouch; *oo.*,=oötype; *o.s.*=oral sucker; *ov.*=ovary; *r. s.*=receptaculum seminis; *s. g.*=shell glands; *t.*=testes; *ut.*=uterus; *vit.*=vitellaria; *v. r.*=vitelline reservoir; *v. s.*=vesicula seminalis.

leads into a long oesophagus which follows a sinuous course to the point of its bifurcation into the intestinal caeca. It is ·53 mm. long and is

surrounded by a layer of gland cells which form a compact glandular mass round the posterior one-fourth or so of the oesophagus. Posteriorly, the oesophagus is produced into a pocket-like structure that hangs freely in the parenchyma. The intestinal caeca arise in front of the median pocket from the oesophagus and run forwards anteriorly for a short distance and curve backwards, thereby forming an anterior loop at the point of their origin. The caeca run backwards almost parallel to the body wall and extend upto the posterior end of the body. Just before their termination posteriorly they bend inwards for a short distance and then run backwards ; they are slender tubes of a more or less uniform diameter.

The excretory pore is situated at the posterior end of the body and is slightly dorsal in position. It leads into two elongated collecting ducts. These ducts pass forwards laterally to the ends of the intestinal caeca, where they narrow out to form the longitudinal ducts running dorsal to the caeca on either side of the body.

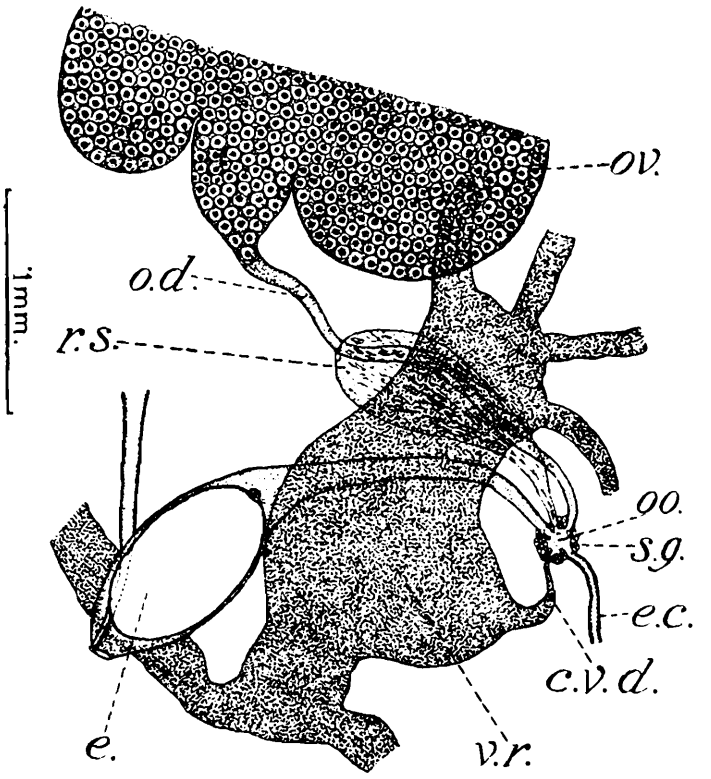

Fig. II.—Female genital organs of *Gomtiotrema sanguina*, gen. *et* sp. nov. Greatly enlarged. For explanation of lettering see fig. 1.

The female reproductive organs consist of a single dome-shaped ovary, trilobed posteriorly. It is situated ·51 mm. in front of the posterior end of the body and is ·25 mm. by ·22 mm. in size. The oviduct arises from the middle lobe of the ovary at the posterior end and passes on the right side of the body. The oviduct after a short course (Text-fig. 2), receives the common vitelline duct from the vitelline reservoir and thus forms the oötype. The receptaculum seminis and the Laurer's canal also meet it at this point and the latter opens to the outside on the dorsal surface behind the region of the vitelline reservoir. The point of union of all these ducts is further marked by the presence of minute shell gland cells, arranged radially about the oötype.

The vitellaria are voluminous and well developed. They consist of masses of follicles on either side of the intestinal caeca, from the oral sucker to the posterior end of the body, but in front of the acetabulum and behind the vitelline reservoir they fill up all the spaces even between the caeca. Behind the genital pore, the ducts from the vitellaria unite together by transverse ducts to form the vitelline reservoir, from where the common vitelline duct takes its origin and opens at the oötype.

The uterus is short and arises from the oötype. It opens on the lateral side of the body at the genital pore situated outside the left intestinal caecum. A single large egg was found in the uterus, its dimensions are ·088 mm. long by ·050 mm. broad. It bears a knob-like projection at one end and is provided with a thick shell of a golden brown colour.

The male reproductive system is characteristic of the sub-family Spirorchinae. There are twelve testes, arranged in a linear series in the intercaecal space. The anterior two testes are separated from each other and also from the rest, but the remaining ten testes are joined end to end. They occupy a region 1·74 mm. in length, the anterior testis being at a distance of 1·58 mm. from the anterior end of the body. They are roughly oval to spherical in shape and vary in size. Beginning from the anterior testis, they are ·12 mm.×·11 mm., ·15 mm.×·15 mm., ·14 mm.×·14 mm., ·14 mm.×·16 mm., ·16mm.×·166 mm., ·15 mm.× ·166 mm., ·15 mm.×·166 mm., ·16 mm.×·19 mm., ·125 mm.×·16 mm., ·127 mm.×·155 mm., ·13 mm.×·16 mm., and ·16 mm.×·16 mm. respectively. The vesicula seminalis lies directly behind the posterior testis, touching the latter. It is widest anteriorly, and gradually tapers posteriorly to form a narrow ductus ejaculatorius. The latter opens at the genital pore besides the female opening, on the left side of the body at a distance of ·45 mm. from the posterior end.

The new genus, *Gomtiotrema*, resembles *Spirorchis*, *Henotosoma* and *Haematotrema* in the general topography of the organs, but is distinguished by the presence of a ventral sucker, shape and number of the testes and the presence of the intestinal loop at the anterior end. From *Diarmostorchis* it differs in the presence of the ventral sucker, the anterior intestinal loop and the relative position of the male and female genital organs. In the presence of the ventral sucker, it resembles the genera *Hapalotrema*, *Hapalorhynchus*, *Vasotrema*, *Spirhapalum*, *Tremarhynchus* and *Coeuritrema*, but differs from all these in the presence of twelve, entirely preovarial testes, the intestinal loop and the position of the genital pore. The only other genus of the family Spirorchidae is *Unicaecum* and from this, the new genus differs in the presence of both caeca, the presence of the ventral sucker, the position of the genital pore, the shape of the ovary and the anterior intestinal loop.

The diagnosis of the genus *Gomtiotrema* may be summarised thus :—

Hermaphroditic, blood-inhabiting distomes, with protrusible suckers; no cuticular spines; relatively large oesophagus; a loop in the intestinal caeca at their origin from the oesophagus. Testes twelve, oval to spherical, preovarial, arranged in linear series, intercaecal; vesicula seminalis continued into a narrow ejaculatory duct; genital pore lateral and posterior. Ovary dome-shaped, trilobed posteriorly, anterior to the

genital pore ; vitellaria extensive ; receptaculum seminis and Laurer's canal present. Uterus short, with a single large egg, which is knobbed.

Host.—Hardella thurgi (Gray).

Locality.—Lucknow, River Gomti.

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