

plants in its seedling stage that it was considered advisable to inoculate soybean plants with the *kulthi* culture. Both the hosts showed characteristic symptoms of the disease in 10 days. *X. phaseoli sojense* was then sprayed on the leaves of soybean and *kulthi* when it was found to produce the characteristic symptoms.

Since the *kulthi* organism resembles *X. phaseoli sojense* in morphological, cultural and physiological characters and since both these pathogens are cross-inoculable, it is considered that *D. biflorus* is a new host of *X. phaseoli sojense* hitherto unreported.

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A REMARKABLE ABNORMALITY IN THE DEVELOPMENT OF *VIVIPARUS* *DISSIMILIS* (MULLER)

DRUMMOND¹ observed a few abnormalities in the development of *Paludina* (= *Viviparus*), and Mattox² has described the abnormalities in the intra-uterine young ones of *Campeloma*. Apart from these observa-

malities in *Viviparus dissimilis*, which is represented in the accompanying illustrations. The embryo, which was living and actively swimming in the albumen in the egg, belongs to an advanced stage of development. The head and foot are normal. The tentacles, the eyes, the buccal mass, the radula, the salivary glands, the opercular area of the foot and the ctenidium have all attained the definitive organization. But the visceral hump is very peculiar. It has bulged posteriorly and dorsally, and is roughly thimble-shaped with a ventral flexure, but without spiral coiling or lateral torsion. The neck of tissue between the visceral mass and the rest of the body is much elongated as compared with the normal condition, and not twisted. Other noteworthy features relating to the abnormality of the visceral mass are the complete absence of a shell and the non-differentiation of the digestive gland.

But the most striking features relate to the mantle cavity, and especially the ctenidium. The mantle cavity is but little developed, being in the form of shallow and open cavity without a roof, and situated at the hind end of the embryo. It is better developed on the left side. The

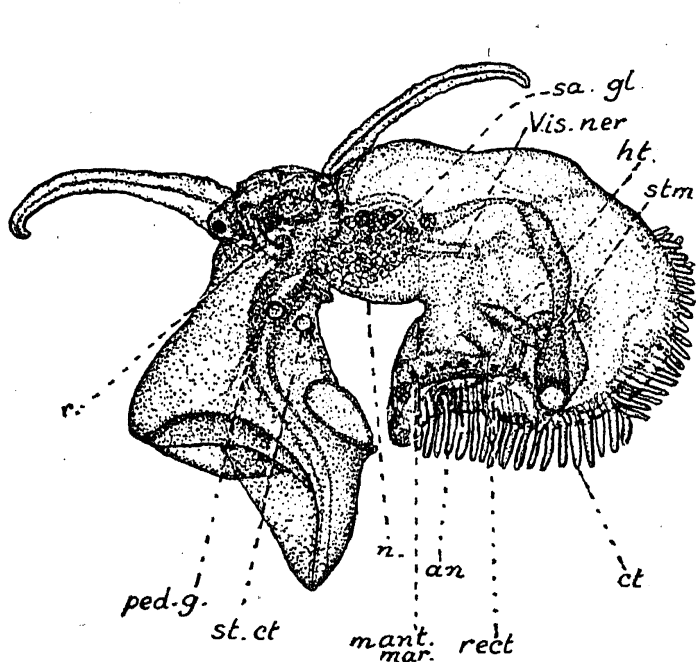


FIG. 1. Abnormal embryo of *Viviparus dissimilis*, viewed from the left side

an., anus; ct., ctenidium; gon., gonadial rudiment; ht., heart; mant. mar., mantle margin; n., neck; ped. g., pedal ganglion; per., pericardium; r., radular sac; rect., rectum; sa. gl., salivary gland; stm., stomach; st. ct., statocyst; visc. ner., visceral nerve.

tions, no detailed studies of abnormal Gastropod development have been made. Recently I came across a remarkable abnor-

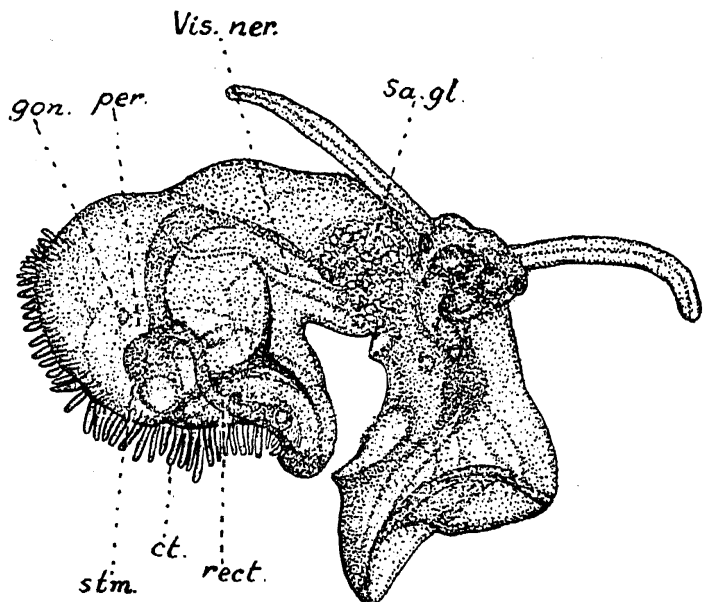


FIG. 2. Abnormal embryo of *Viviparus dissimilis*, viewed from the right side

ctenidium however is well developed, much elongated and composed of about forty filaments. But its position is abnormal, as

it extends on the outer surface of the visceral hump from the rudimentary mantle-edge right up to the apex. Alongside of the ctenidium is a low ridge which probably represents the aborted continuation of the mantle fold. The position of the ctenidium in relation to the rectum is also noteworthy, since it is found to the left of the rectum and would have become the topographically right ctenidium if torsion had taken place and the mantle cavity shifted to the anterior end, whereas in the typical streptoneurous Gastropod the definitive ctenidium is the primitive right but topographically left ctenidium. The other pallial organs also have consequently changed their position in relation to the rectum in the present case, which may be considered therefore as an instance of *situs inversus*.

The posterior position of the mantle cavity admits of an explanation in terms of differential growth, but the position of the ctenidium on the outer side of the visceral hump is very puzzling. There is no evidence of the mantle having turned inside out (by a process analogous to that of an extrogastrula). Probably the ctenidial rudiment has developed precociously and grown rapidly along with the visceral hump, while the mantle fold has remained in an abortive condition, spread out and continued as a low ridge alongside of the ctenidium, so that the mantle cavity is shallow and without a roof.

It may not be incorrect to attribute the abnormalities partly to the non-development of the shell gland, for the development of the mantle fold and mantle groove is related in space and time to that of the shell gland. But to account for the suppression of the shell gland is not easy. I have been trying to induce experimentally this type of abnormality in the laboratory, but have not been successful so far. If we could understand the causal factors of abnormal development, some of the problems of Gastropod development like torsion would be better explained than at present.

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1. Drummond, J. M., *Quart. J. micro. Sci.*, 1902, 46. 2. Mattox, N. T., *Am. Mid. Nat.*, 1936, 16.

CARPET BEETLE DAMAGE TO TELEPHONE WIRES

THE carpet beetle (*Anthrenus* sp., *Dermestidae*, *Coleoptera*), is commonly met with in different parts of India, damaging woollen fabrics. On account of the large tufts of hair on the grubs and pupæ, the insect is popularly called the 'woolly bear'. The damage is caused mostly by the grub, which bites the woven fabric causing holes and ultimately converting the same into a mass of cut threads.

The insect shuns light and invariably feeds on that surface of the fabric which is against light and thus avoids easy detection.

In February 1948, the Telephone Exchange, Bangalore, reported serious damage to the insulation of the telephone wires of the machinery. On examination large numbers of this insect in various stages of development were found infesting the material; the insect was probably breeding in the medium for some time prior to February. Availability of plenty of food material and the well-closed rooms were very well suited for the optimum activity and rapid multiplication.

Thousands of grubs had scraped and bitten the insulation material, exposing the wire and harboured themselves in the several crevices thus created. As a consequence, it was reported that there was short circuit.

A dust containing a mixture of 4 parts of D.D.T. spray powder (Geigy), 4 parts of Pyrethrum and 1 part of Gammexane D 025 (I.C.I.) was used against the insect. The worst affected columns of machinery were completely covered with tarpaulin and then the dust applied liberally. About 2 hours after dusting most of the grubs and adults were found to be disturbed from their resting places and few were found in a moribund condition. As a small number of grubs were found alive even after 96 hours it was found necessary to give a second dusting. Sufficient time was allowed for the egg, if any, to hatch out and a second dusting was done allowing an interval of three weeks between the two dustings.

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