

## REPRODUCTIVE BEHAVIOUR OF *ACROBELOIDES* SP.

BY

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There is an inherent tendency for attraction between adults and juveniles of *Acrobeloides* sp. resulting in their aggregation. The males are strongly attracted towards females which results in mating. During copulation it was observed that the males appear to be more activated. The egg-laying is performed by the contraction of uterine muscles and due to an increased turgor pressure inside the body of the nematodes. The females as they grow older appear to be increasingly incapable of laying eggs which are retained within the uterus and undergo intra-uterine development. This type of development proceeds at a faster rate compared to the normal extra-uterine development. The increased frequency of pulsation of the oesophageal valve before hatching probably is an indication for hatching. The third-stage juveniles, young males, and egg-laying females are more active than the other stages in the life cycle of this nematode.

Although the biological aspects of reproduction in plant-parasitic and soil-inhabiting nematodes have received some attention in recent years (Wallace, 1963), the behavioural aspects of reproduction remain largely unknown. Green (1966) studied sex attraction in *Heterodera rostochiensis* and *H. schachtii* and came to the conclusion that it is a type of chemo-orientation. Thomas (1965) observed the reproductive behaviour of *Acrobeloides complexus*, Greet (1964) and Jones (1966) of *Panagrolaimus rigidus* and *Pelodera teres* respectively. The egg-laying mechanism was studied in *Criconeimoides xenoplax* by Seshadri (1965) and in *Hoplolaimus indicus* by Dasgupta *et al.* (1970). These authors observed that the egg was laid by the contraction of uterus. However, Brun & Cayrol (1970) working with *Ditylenchus myceliophagus* and Yuen (1971) with *Aphelenchoides blastophthorus* came to the conclusion that eggs are pushed out due to the pressure within the body of nematodes. Seymour (1973), and Doncaster & Seymour (1973) observed that the ova of *A. blastophthorus* come down from the ovary on account of their growth and by the kneading action of the muscles of body wall which create a backward and forward flow of fluids in the gut resulting in alternate expansion and contraction of the musculature of the posterior region of body.

The present paper deals with some aspects of reproductive behaviour of the soil-inhabiting nematode, *Acrobeloides* sp. in agar culture at a temperature of  $28 \pm 3^\circ$ .

### MATERIALS AND METHODS

The nematodes (*Acrobeloides* sp.) were extracted from soil and cultured on Nigon's (1949) agar medium (bacteriological). 25 ml of this medium were

poured into each of ten 9 cm diam. petri-dishes which also received 3 ml of supernatant each from the soil suspension which yielded the nematode species. Twenty males and 40 females were transferred to each petri-dish, and the nematodes were then kept in an oven at  $28 \pm 3^\circ$  for 3 weeks to reproduce. Every day the petri-dishes were opened for about 15 min to aerate the animals.

General attraction, sex attraction, copulation, egg-laying, embryonic development, hatching and activity were recorded in a series of experiments. The nematodes were observed in culture medium, water suspension or 1% water-agar in tap water. The suspensions were prepared by adding water to the culture medium and then transferring the contents to another petri-dish.

Attraction of males, females and juveniles to the secretions of each other was examined on 1% water-agar in 9 cm diam petri-dishes. The bottom of each dish was marked into four equal quadrants with Indian ink. Secretions were absorbed onto 1% water-agar poured into three 3.5 cm diam petri-dishes into which approx. a hundred immature males, 100 young females without uterine eggs or 100 juveniles were transferred. These dishes were kept in the dark at  $28 \pm 3^\circ$  for 2 days. Sufficient aeration twice a day for 15 min each was provided. Afterwards, 0.5 cm agar discs were cut out from each of the dishes. All nematodes were removed with a needle from the discs and each disc was then placed separately in one of the three zones of the 9 cm diam petri-dishes. The fourth zone was left blank to serve as control (Fig. 1). About 50 males, females or juveniles were added to the centre of each dish separately after 10 min. The nematodes in each zone were observed after 24 h. Ten replicates each of these experiments were performed.

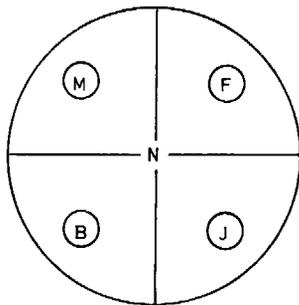


Fig. 1. The quadrants of a petri-dish and the arrangement of discs impregnated with male, female and juvenile secretions used for the study of attraction. M-male; F-female; J-juvenile; B-blank (control); N-neutral.

The locomotory pattern of males and females during attraction on 1% water-agar was examined in five 9 cm diam petri-dishes. Ten males and ten females were placed at opposite sides of the dish which was kept in the dark at  $28 \pm 3^\circ$  for 24 h. Fifteen distinct tracks showing starting points of locomotion as well as mating spots were drawn with the help of a camera lucida. The wave length ( $\lambda$ ) and amplitude ( $\alpha$ ) were measured for males and females separately (Fig. 2).