

*Section of Nematology, Department of Zoology, Aligarh Muslim University,  
Aligarh 202001, India*

## NEMATODES IN IRRIGATION WATER

by  
M. I. S. WALIULLAH

The dissemination of nematodes pathogens in irrigation water has been recognised as a serious threat to crop production (Faulkner and Bolander, 1966; 1970 a and b; Tobar-Jimenez and Palacios-Mejia, 1976). Nothing is known about the numbers and distribution of nematodes in irrigation water in India. This paper reports the results of a survey on the occurrence of nematodes in irrigation water of the Upper Ganges Canal, a major irrigation canal for the Gangetic plains of North India.

Three stations were selected on the west bank of the canal at Jawan, Aligarh. Station C was 200 metres upstream from the bridge of the canal, and stations B and A were 200 and 400 metres downstream from it, respectively. Ninety litres of water were collected monthly from the canal in aliquots of 30 litres each from October 1978 to December 1979. The three aliquots were collected on day 28 of each month between 3 and 5 p.m., and immediately sieved. Water samples were obtained from the canal by dipping a one litre jar about one metre from the bank. The water was poured over a 400  $\mu\text{m}$  sieve and this was repeated 30 times at each location beginning with station A. The sieved residues were placed in a large container to which residues from the other two stations, B and C, were added. The aliquots sampled were placed in Baermann's funnel for nematode extraction. After 60 hours the nematodes were drained from the funnel into a beaker and the volume made up to 100 ml. The total

number of nematodes was counted and they were identified to generic level.

Nematode numbers in the canal water varied between 35-137 per 30 litres. Tylenchida, Dorylaimida and Mononchida represented 12 to 35%, 20 to 51% and about 1% respectively, of the total population (Table I). This indicates that approximately  $87 \times 10^6$  to  $35 \times 10^7$  nematodes passed a given point per day. Nematode populations were variable, and whenever the total count was high the number of tylenchids and dorylaimids was also high. The nematodes remained alive more than 15 days in the same water.

Godfery (1923) was the first to point out the possibility of nematodes being dispersed in irrigation water. Later, Faulkner and Bolander (1966) demonstrated the potential of irrigation water for the

Table I - *Nematodes found in the Upper Ganges Canal from October 1978 to December 1979.*

Genus	Total numbers during period
<i>Tylenchus</i>	4
<i>Tylenchorhynchus</i>	2
<i>Quinisulcius</i>	5
<i>Basiria</i>	7
<i>Sakia</i>	1
<i>Basirolaimus</i>	57
<i>Basiroides</i>	2
<i>Helicotylenchus</i>	116
<i>Rotylenchus</i>	22
<i>Aphelenchoides</i>	19
<i>Hemicriconemoides</i>	2
Other tylenchids	3
<i>Xiphinema</i>	22
<i>Longidorus</i>	2
<i>Discolaimus</i>	10
<i>Trichodoros</i>	5
<i>Dorylaimus</i>	10
<i>Enchodelus</i>	5
Other dorylaimids	173
<i>Mylonchulus</i>	7
Other free-living	504
Total	978

dissemination of nematodes and in their investigations in two canals found that 10 to 20% of the total number were plant parasites. They showed that the nematodes were distributed randomly in flowing water.

In the present survey the larger number of nematodes was recorded during the rainy season from July to September 1979, indicating that the nematode source was from run off from fields into the canal. It has been assumed that nematode pests may not be able to survive long periods of submersion in water in the absence of a food supply and with the rapid exchange of gases (Wallace, 1971). This study showed that nematodes could survive at least 15 days. Tobar-Jimenez and Palacios-Mejia (1976) also showed that the infectivity of nematodes was not affected by their remaining in an irrigation canal for up to 64 days.

I thank Dr. Shahid Hasan Khan for advice and Professor Nawab Hasan Khan, Chairman, Department of Zoology, Aligarh Muslim University, Aligarh, for facilities. The Council of Scientific and Industrial Research, New Delhi is also gratefully acknowledged for the financial support.

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Accepted for publication on 30 June 1984.