PREDATORY BEHAVIOUR OF AQUATIDES THORNEI
(NYGOLAIRMINA: NEMATODA)

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Studies on its predatory behaviour revealed that Aquatides thornei was not attracted towards live
nor bisected prey nematodes, but made contact with the prey by chance: labial contact was
necessary to initiate an attack. Several predators aggregated and fed on prey injured by another
predator. No preference was shown for any part of the body for attack; Rhabditis sp. was selected
in preference to Chiloplacus symmetricus. A. thornei seemed to paralyse the prey after its mural tooth
was inserted deep into the body. Ingestion was intermittent with short periods of sucking activity,
the duration of feeding on a single prey varied from 3-5 min to 4-6 h. Little variation was found
in the daily rate of predation during 12 days. The rate of predation increased as the number of
prey increased. Maximum predation occurred with 150 prey and least with 25 prey nematodes.

Keywords: Behaviour, predator, prey, biological control, feeding.

Mononchs and dorylaim nematodes are known to be predacious and Thorne
(1930, 1939) had suggested that nygolaims including Sectonema were predatory
in habit. Since then several species of Dorylaimus, Discolaimus and Actinolaimus
have been described as predatory (Linford & Oliveira, 1937). Esser (1963) had
also observed that species of Dorylaimus, Labronema, Discolaimus and Car-
charolaimus were predatory. The dorylaim predators are omnivorous and derive
their food from other sources also such as algae and fungi (Hollis, 1957; Ferris,
1968; Wood, 1973). Wyss & Grootaert (1977) studied the feeding mechanism of
Labronema vulvapapillatum Loof & Grootaert, 1981, a predatory dorylaim, while
the ultrastructure and function of its anterior feeding apparatus was studied by
Grootaert & Wyss (1978). Small & Grootaert (1983) observed the predatory
abilities of nematodes belonging to different orders on a range of prey species
and found Panagrellus redivivus (Linn, 1767) Goodey, 1945 to be most suscepti-
ble to attack of the free-living or plant-parasitic species used as prey.

The following observations were made on a nygolaim nematode, Aquatides
thornei (Schneider, 1937) Ahmad & Jairajpuri, 1979 to study its predatory
behaviour.

MATERIALS AND METHODS

Soil samples containing Aquatides thornei were collected from paddy fields
near Jamalpur, Aligarh. These samples were processed by sieving and decan-
tation and a modified Baermann funnel method. The nematodes were rinsed repeatedly in distilled water and kept in tapwater before use. Only male and female predators and adult prey were selected for study. All experiments were carried out at 25 ± 1°C in an incubator.

The feeding of A. thornei at 66× magnification was observed by inverting the Petri-dishes containing A. thornei and prey nematodes in 1% water-agar under the binocular microscope. To study the feeding mechanism at 450× or higher magnifications simple observation chambers similar to those used by Wyss & Grootaert (1977) were made. These consist of glass slides with a small quantity of 1% water-agar. The agar when cool, was cut into 2 × 1.5 × 0.5 cm blocks. Ten specimens of A. thornei, both males and females, were placed in agar blocks together with 100-150 specimens of Rhabditis sp. and Chiloplacus symmetricus (Thorne, 1925) Thorne, 1937 which served as prey. To facilitate entry of nematodes, the agar surface was incised with a needle. The agar block containing predators and prey was gently covered by a cover-slip and kept at 25 ± 1°C for 15 min before starting the observations.

To determine whether A. thornei were attracted towards prey, petri-dishes 5.5 cm in diameter were divided into three zones viz., inner, middle and outer by drawing two concentric circles 0.5 and 2.5 cm in diameter. A plastic straw 5 mm high, 5 mm in diameter, with a small piece of filter paper glued at one end was placed vertically in the inner zone of the petri-dish, with the filter paper in contact with the petri-dish. The petri-dish and straw was then filled with a 0.5 cm thick layer of 1% water-agar. The response of A. thornei was tested towards live and bisected (cut into two pieces) prey. To observe its attraction towards live prey, 25 Rhabditis sp. were placed in the straw pipe and left for 4 h. Five predators were then released on the periphery of the middle zone. The distribution of A. thornei was recorded after 1, 2, 3 and 4 h. Scores were obtained by summing up the products of the number of worms in each zone with their corresponding weighting factors. The weighting factors were obtained by dividing the area of outer zone by that of each of the three zones. These scores were then converted into log scores and plotted against time (Ahmad & Jaira-jpuri, 1980). The second experiment was identical to the above except that the prey were bisected. Each experiment was replicated fifteen times.

To determine the pattern of feeding during a period of 12 days five A. thornei were placed with 25 specimens of C. symmetricus in cavity-blocks containing a 0.5 cm thick layer of 1% water-agar. Observations were made every 24 h and the predators then transferred to fresh cavity-blocks with 25 fresh prey. A similar experiment was carried out with A. thornei and Rhabditis sp. Each experiment was replicated five times.

To observe the effect of prey numbers on the rate of feeding, 25, 50, 75, 100, 125 or 150 specimens of C. symmetricus were placed in separate cavity-blocks containing a 0.5 cm thick layer of 1% water-agar. Five A. thornei were placed in each cavity-block. The same experiment was carried out with Rhabditis sp. and