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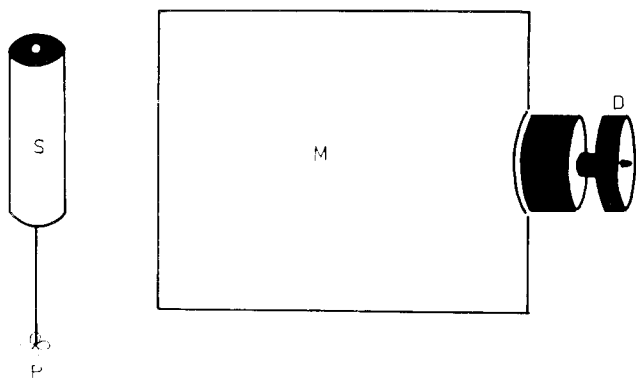
EFFECTS OF MECHANICAL STIMULATION  
AND CROWDING ON *MYLONCHULUS DENTATUS*

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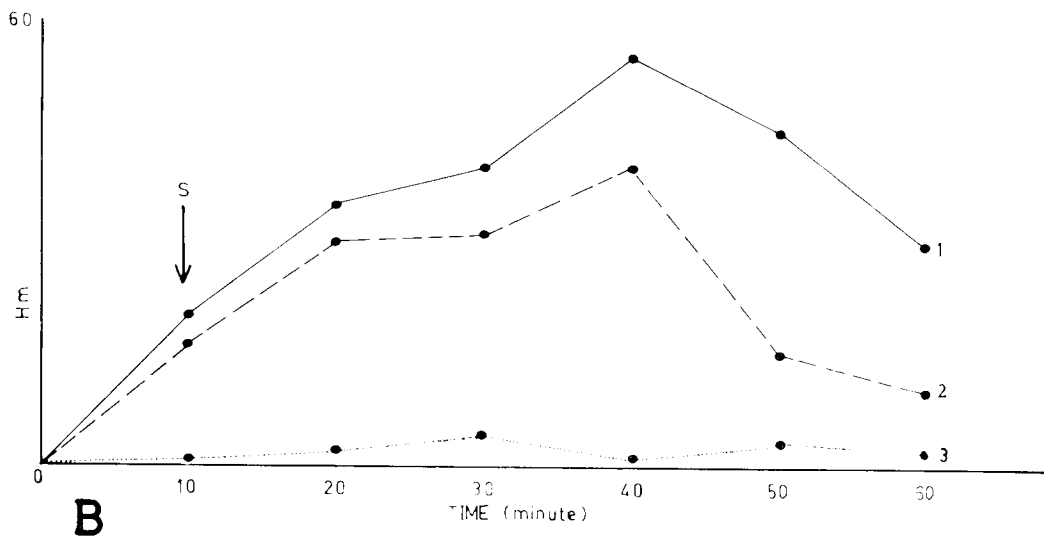
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It has long been recognized that mononchs hunt their prey by some sense other than sight (Cobb, 1917) and that they are unable to detect their prey even from very short distances (Steiner and Heinly, 1922; Esser, 1964). Yeates (1969) concluded that predation is mainly by chance encounter and tactile stimuli help in detecting the prey. We noticed that *Mylonchulus dentatus* Jairajpuri, 1970 were immobile in water but when touched with a needle they immediately became excited, suggesting the type of activity when contact is made with their prey. It was also noticed that when many *M. dentatus* were kept in water without prey they then resorted to cannibalism. Both these aspects of behaviour were studied in a series of experiments.

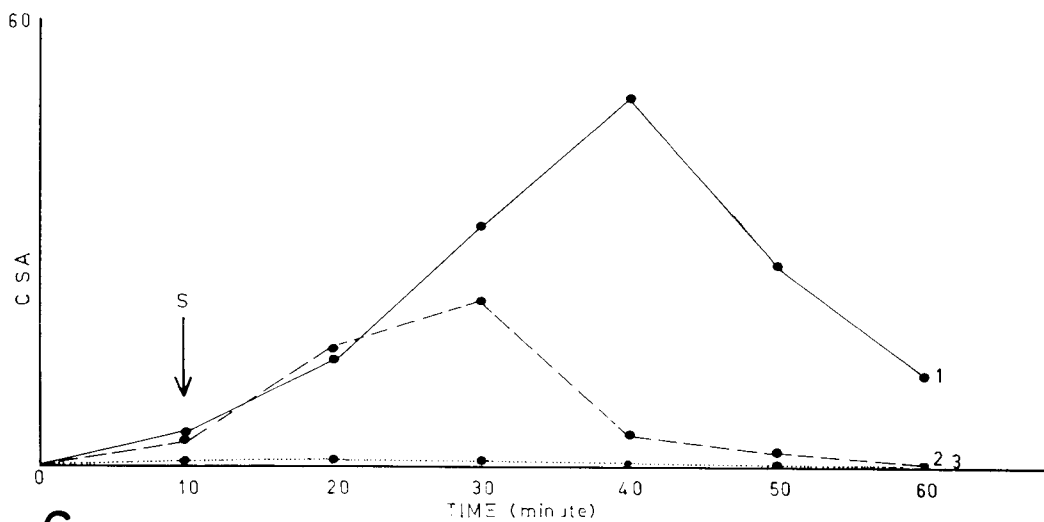
Response to mechanical stimulation, i.e., thigmokinesis, was investigated using wells of 4 cm depth and 2.5 cm diameter made from lengths of plastic tube glued to glass plates. Ten *M. dentatus* adults were placed in each of 10 wells filled with 3 ml tap water and 5 wells with 3 ml boiled (de-gassed) tap water. The nematodes in 5 wells of the first set and those of the second set were mechanically stimulated with a stirrer device consisting of a length of horse hair attached to a small piece of wood and rotated for 2 minutes at 4000 RPM by means of a 6V DC motor (Fig. 1, A). The number of head movements per minute and the number of active individuals were recorded after 10 minutes stimulation. The experiments were done at room temperature  $26 \pm 3^{\circ}\text{C}$  with 10 replicates of each treatment.



**A**



**B**



**C**

**Fig. 1**

To study the effects of crowding and cannibalism, adult and juvenile *M. dentatus* were placed in the plastic wells containing 3 ml tap water and kept in the dark for 12 hr at  $27 \pm 2^\circ\text{C}$ . Head movements and the numbers of active, inactive and injured individuals were then recorded using a microscope. There were 10 replicates of each of the combinations of adults and juveniles.

Mechanical stimulation of the nematodes in tap water resulted in a gradual increase in the sideways movement of the head and general activity, reaching a peak at 40 minutes in untreated tap water (Fig. 1, B). Movements in the unstimulated controls were few and sporadic. In boiled tap water the peak activity was reached 30 minutes after stimulation, this lesser time probably reflecting the lack of oxygen in the water compared with untreated tap water.

A product of the sideways movement of the head (Hm) and the percent active nematodes (pa) may be regarded as indicative of the likelihood of the nematodes encountering their prey. The

Hm x pa

Coefficient of Searching Activity (CSA) is calculated as  $\frac{\text{Hm} \times \text{pa}}{100}$

and values given in Table I indicate a similar rate of increase of searching activity in untreated and boiled tap water, but sustained for a longer period in the former (Fig. 1, C).

Groups of varying numbers of adults and juveniles placed in the plastic wells showed similar rates of head movement (40-56/minute) irrespective of the number of individuals in the well. General activity was very variable but increased crowding resulted in more nematodes injured. For example, in a well with 15 adults and 5 juveniles, 6 adults and 4 juveniles were injured; with 5 adults and 5 juveniles, 1 adult and 2 juveniles were injured. It is concluded that when the density of predators is high and prey is not available the nematodes probably resort to cannibalism.

Fig. 1 - A - Apparatus used for the mechanical stimulation of *Mylonchulus dentatus* (M - 6 volt DC motor; D - Disc which rotates with the motor; S - A piece of light wood; P - Point of the stirrer made of horse hair. The wood was fixed on the knob of the disc D for providing stimulation).

B - Movements of the head per minute (Hm) after giving the stimulation (S).

C - Coefficient of searching activity (CSA) after stimulation (—— 1 - in tap water; --- 2 - in partially degassed water; and ..... 3 - control).

Table I - Effect of mechanical stimulation on *Mylonchulus dentatus*.

Time in minutes	Stimulated						Non stimulated (control)		
	Tap water			De-gassed water			Tap water		
	Hm	pa	CSA	Hm	pa	CSA	Hm	pa	CSA
Before stimulation	0	0	0	0	0	0	0	0	0
After stimulation									
10	20	20	4	16	20	3.2	0	0	0
20	35	40	14	30	50	15	2	2	0.04
30	40	80	32	31	71	22	4	3	0.12
40	55	90	49.5	40	10	4	1	2	0.02
50	45	60	27	15	10	1.5	3	4	0.12
60	30	40	12	10	2	0.2	2	1	0.002

Hm = Head movement per minute; pa = percentage of active individuals; CSA = Coeff. of searching activity. Statistical significance  $P = 0.01$ .

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