Notes brèves

SOME FACTORS INFLUENCING PREDATION BY *MONONCHUS AQUATICUS*

Anwar L. Bilgrami*, Irfan Ahmad* and M. Shamim Jairajpuri**

Few studies have been made on the predatory ability of mononchs. Nelmes (1974) studied the predatory behaviour of *Prionchulus punctatus* (Dujardin, 1845) & Wu Hoeppli, 1929, while that of *Mononchus aquaticus* Coetzee, 1968 was studied by Grootaert and Wyss (1979). Jairajpuri and Azmi (1978) observed the predatory potential of *Mylonchulus dentatus* and the practicability of using mononchs to control nematodes was assessed by Cohn and Mordechai (1974) and Small (1979).

The rate of predation on different species was determined by placing five *Mononchus aquaticus* with 25 specimens of prey in cavity blocks containing 1 % water agar. Five species of prey, *viz.*, *Chiloplacus symmetricus* (Thorne, 1925) Thorne, 1937, *Cephalobus* sp., *Mesorhabditis* sp., *Prismatolaimus* sp., and *Aglenchus parvus* Siddiqi, 1963 were used separately. To observe the effect of temperature on predation, specimens of *M. aquaticus* were kept at different temperatures ranging from 10 to 40° together with 25 specimens of *C. symmetricus* in cavity blocks containing 1 % water agar. Predation was recorded after 24 hr. Similarly, the effect of agar concentration was observed by placing five predators with 25 *C. symmetricus* in 1, 2, 3, 4, 5 and 6 % water agar. The number of prey killed or devoured was counted after 24 hr.

Activeness (activity) was measured in terms of two parameters. In the first experiment where different prey were used, it was expressed as displacement, *i.e.*, distance (mm) moved per minute while in the temperature and agar concentration experiments it was expressed as waves per minute. A swing of the head to one side, then back over the initial point to the other extreme and then back to the initial point was considered as one wave.

The frequency of predation of different nematode species by *M. aquaticus* was found to vary. *Cephalobus* sp. and *Aglenchus parvus* were preyed on more than the others. This differential predation rate was inversely related to the activeness of the prey. The most active prey, *Prismatolaimus* sp., was killed the least while the least active, *Cephalobus* sp., was devoured the most (Fig. 1). The number of *Cephalobus* sp. killed was significantly higher ($p < 0.05$) than those of *C. symmetricus* or *Mesorhabditis* sp. It was also higher than *Prismatolaimus* sp. ($p < 0.01$), but from *Aglenchus parvus* it showed no significant difference ($p > 0.05$).

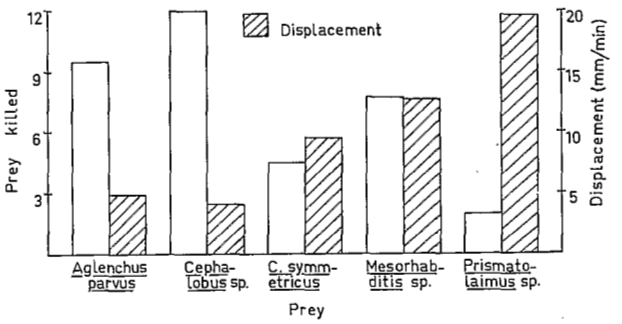

Fig. 1. Effect of type of prey and prey activeness on predation rate.

The rate of predation was also found to be influenced by differences in temperature. The optimum temperature appeared to be 25° at which maximum predation occurred (Fig. 2), and was significantly reduced at lower or higher temperatures ($p < 0.01$). The increased activity of prey and predator increased the rate of predation while decreased activity reduced it. The activeness of both the predator and the prey was maximum at 25°. Predation also depended on the concentration of the agar medium used. One or 2 % water agar was more suitable for the predators

* *Section of Nematology, Department of Zoology, Aligarh Muslim University, Aligarh - 202001, India.*
** *Commowealth Institute of Parasitology, 395 A Hatfield Road, St. Albans, Herts. AL4 OXU, England.*

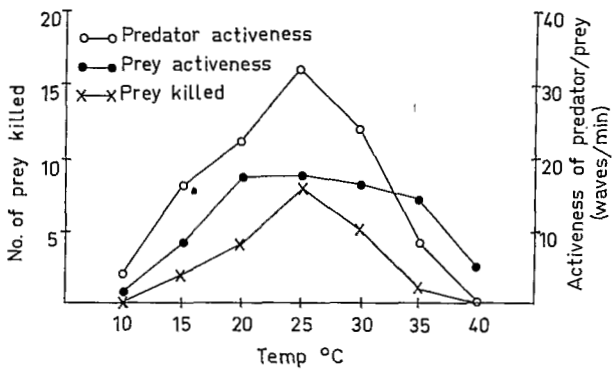

Fig. 2. Effect of different temperatures on predation rate.

and not much difference in the rate of predation was observed between them (Fig. 3). Higher concentrations reduced predation significantly ($p < 0.01$) and in 6 % agar no prey was killed. In this case also predation appeared to be related to the activeness of the predators and the prey as was the case for temperature. Higher agar concentrations reduced activity and also predation. Maximum predation occurred in 1 % agar.

From the data presented, it is evident that *M. aquaticus* showed no consistent predatory pattern with different prey species and that some were devoured more than others. Such differences could probably be related to the activeness of the prey, the less active being more vulnerable to attack than the more active, and it may be for this reason that significantly more *Cephalobus* sp. were killed than *Prismatolaimus* sp. Maertens (1975) using *Prionchulus punctatus* observed an average of ten *Panagrellus redivivus* killed per day while Nelmes (1974) using the same predator but *Aphelenchus avenae* as prey recorded ten kills per hour. It seems possible that this difference could be due to differences in prey behaviour, and one of the most likely causes may be the differential prey activeness, as free-living nematodes possess higher endogenous activity (Croll, 1972). Besides, the experimental techniques might have also caused differences in predation.

Like prey activeness, predator activeness is also an important factor governing predation. Those factors, such as temperature and agar concentration, which influenced predator activity also influenced predation rate.

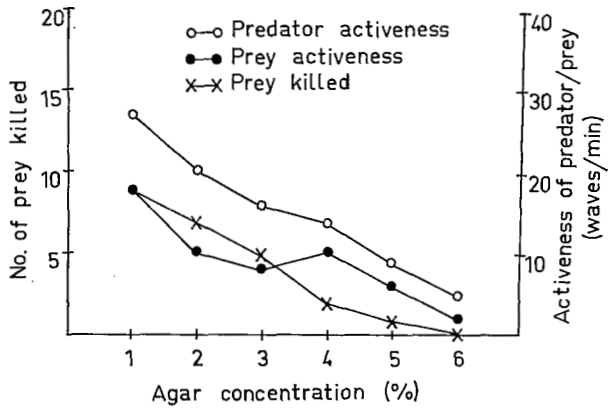

Fig. 3. Effect of different agar concentrations on predation rate.

Accepté pour publication le 29 juillet 1982.

ACKNOWLEDGEMENTS

We thank the Chairman, Department of Zoology for laboratory facilities and the UGC and CSIR for financial assistance to the first and second author.

REFERENCES

COHN, E. & MORDECHAI, M. (1974). Experiments in suppressing citrus nematode populations by use of marigold and a predacious nematode. *Nematol. medit.*, 2 : 43-53.

CROLL, N. A. (1972). Behavioural activities of nematodes. *Helminthol. Abstr.*, 41 (B) : 87-105.

GROOTAERT, P. & WYSS, U. (1979). Ultrastructure and function of the anterior feeding apparatus in *Mononchus aquaticus*. *Nematologica*, 25 : 163-173.

JAIRAJPURI, M. S. & AZMI, M. I. (1978). Some studies on the predatory behaviour of *Mylonchulus dentatus*. *Nematol. medit.*, 6 : 205-212.

MAERTENS, D. (1975). Observations on the life cycle of *Prionchulus punctatus* (Cobb, 1917) (Nematoda) and some culture conditions. *Biol. Jb. Dodonaea.*, 43 : 197-218.

NELMES, A. J. (1974). Evaluation of the feeding behaviour of *Prionchulus punctatus*, a nematode predator. *J. anim. Ecol.*, 43 : 553-565.

SMALL, R. W. (1979). The effects of predatory nematodes on population of plant-parasitic nematodes in pots. *Nematologica*, 25 : 94-103.