

## Feeding mechanisms and role of predatory soil nematodes in biological control of nematode pest

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Nematodes are small microscopic worms belonging to the Phylum Nematoda. They are one of the most numerous and diverse groups of multicellular animals on earth. On the basis of their feeding habits, nematodes are known as plant feeder, bacterial feeder, fungal feeder, algal feeders, animal predator, and omnivore. All these types of nematodes may coexist in soil. The predatory nematodes feed on soil microorganisms including plant-parasitic nematodes. They continuously reduce population of plant-parasitic nematodes in virtually all soil because of their constant association with plant-parasitic nematodes in rhizosphere. Predatory nematodes belong to four major taxonomic groups of nematodes, which are Mononchida, Dorylaimida, Diplogasterida and Aphelenchida. Each group is having different type of feeding apparatus, feeding mechanisms and food preference.

The feeding apparatus of mononchids have large buccal cavity which is equipped with tooth, teeth and denticles. All species are predaceous; they may swallow whole prey if size is smaller or may rupture prey body to suck the body contents. They can be cultured on prey species in laboratory conditions. The feeding apparatus of dorylaimids is hollow odontostyle (nygolaimids have needle like feeding apparatus).

The species of *Aporcelaimus*, *Aporcelaimellus*, *Dorylaimus*,

*Eudorylaimus*, *Mesodorylaimus*, *Discolaimus*, *Labronema*, *Nygolaimus*, *Aquatides* etc. are known to feed on plant-parasitic nematodes. They feed either by piercing the body of prey or injecting enzymes into the food source and suck out predigested contents. Aphelenchid predators, *Seinura* spp. penetrate the cuticle of prey nematodes with their fine needle-like stylet and inject oesophageal secretions (saliva) into the prey body, which paralyses the prey almost instantly. They complete their life cycle in 3-6 days, have high reproductive potential and can be easily and rapidly cultured on fungivorous nematodes. The diplogasterid predators possess small but well developed buccal cavity which is armed with teeth. The studies on species of *Butlerius*, *Diplentron* and *Mononchoides* suggest that they are potential biocontrol agents for plant-parasitic nematodes. Diplogasterids are generally found abundantly in decomposing organic manure feeding on bacteria. They can be easily cultured on simple nutrient media containing bacteria.

Several studies in laboratory and greenhouse conditions have shown that predatory nematodes are effective in killing plant-parasitic nematodes. Opinions regarding the effect of predatory nematodes on population of plant-parasitic nematodes are based on observations largely unsupported by field experiments data. The possibility of using predatory nematodes in biological control of plant-parasitic nematodes can not be ruled out. There is much opportunity and scope for isolating nematode species that have great potential as predator. The immediate priority is to assess the diversity of predacious species present in different agro-climatic regions.

The efforts should include identification of predatory nematode species that are well adapted to local climates and to develop sustainable techniques for their mass culturing, formulation and time and mode of application. After testing predation potential in pot experiments, field experiments need to be conducted and, if results are encouraging, properly designed multi-location trials should be initiated. Extensive research and development and extension efforts are required to identify and popularize this environmentally friendly nematode pest management approach.