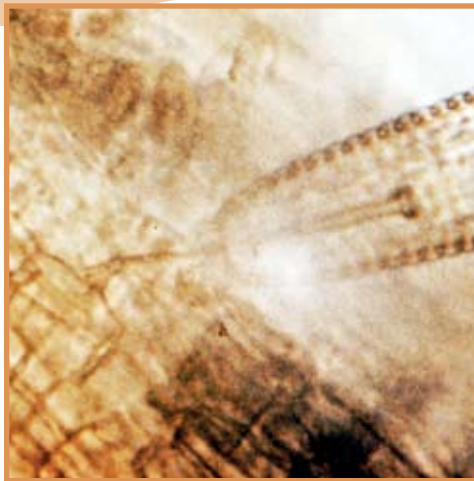


Discover

COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES

NEMATOLOGY

Nematodes are the most abundant multicellular animals on earth. Through research and scholarship, the department develops new understanding on the role, importance, and management of nematodes in plant and animal health, and in environmental quality in terrestrial, freshwater, and marine ecosystems.



RESEARCH

Research priorities in the Department of Nematology include:

Decreasing agricultural impact of plant and animal parasitic nematodes and reducing the use of toxic pesticides, including development of nematode-resistant crop plants through new and traditional approaches and tools that rapidly identify nematode species.

Advancing knowledge of fundamental nematode biology through studies of genetics, molecular biology, host-parasite interactions, and ecology. This includes the development of nematodes as model systems for studying issues of wider significance, such as aging.

Promoting the beneficial uses of nematodes, including the biological control of pest species using nematodes, and developing the role of nematodes in soil-nutrient cycling.

IMPACT

- Develop integrated pest management strategies for pest control advisers and agricultural commodity groups
- Implement nematode management strategies that use nematicides and cover crops
- Increase speed and accuracy of nematode identification
- Improve fundamental understanding of nematode biology
- Characterize nematode-resistance genes in tomatoes, resulting in more productive tomato varieties
- Improve control strategies for root-knot nematodes through a department program that assists pest control advisers and growers
- Replace chemical pesticides with commercially developed insect-attacking nematodes
- Improve agricultural sustainability strategies that will increase the number of beneficial soil nematodes and other natural enemies of soil pests
- Provide essential data on nematode biology and management through the department's Web-based information system on plant and soil nematodes. The site is visited extensively by users throughout the U.S. and internationally.

FUTURE PRIORITIES

The priorities of the department will expand to increase understanding of the biology and ecology of beneficial (e.g., free-living and insect-parasitic) and plant- and animal-parasitic nematodes through investigations of nematode biodiversity, evolution, genetics, biochemistry, population genetics, soil ecology, and host-parasite interactions.

This knowledge is applied by developing strategies for control of plant- and animal-parasitic nematodes, and promoting the use of beneficial nematodes to safeguard agricultural production and the environment.

These outcomes are useful for Californians because they can lower the cost of agricultural products to consumers while simultaneously improving environmental quality through reductions in pesticide use.

For example, for certain insect pests with stages that develop in the soil, beneficial nematodes can be used to reduce pest populations without the use of insecticides.



Recent advances in our understanding of nematode biology, coupled with developments in biotechnology, genomics, informatics, and instrumentation, will facilitate novel approaches for future nematode research. These advances also will create new opportunities for using free-living and insect-parasitic nematodes to benefit agricultural production and the environment.

Comparative nematode genomics will extend current model nematode systems (e.g., *Caenorhabditis elegans*) to groups of nematodes with greater relevance to studies of plant parasites and certain groups of animal parasites. Studies of chemical communication and signaling between hosts and nematode parasites are considered particularly promising subjects of investigation.

Members of the Department of Nematology, with their knowledge of nematode biology and other scientific disciplines, are poised to integrate these new developments into their research programs.

PHOTO, PAGE 1: A sheath nematode *Hemicycliophora* using its stylet to feed on a plant root. Some species of sheath nematodes can cause substantial damage to crops.



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Department of Nematology
Phone: (530) 752-0300

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