

EXERCISE # 4**GENERALIZED LIFE CYCLE OF PLANT PARASITIC NEMATODES**

The nematodes are invertebrate roundworms that inhabit marine fresh water and terrestrial environments. The majority of nematodes are microscopic, averaging less than a millimeter in length, but some of the animal parasites are quite large and readily visible to the naked eye. The animal and plant parasites are of direct importance in agriculture, environment, human health; however, most nematodes in the environment are not parasites. Nematodes that feed on other organisms are important participants in the cycling of minerals and nutrients in the ecosystem that is fundamental to other biological activity. Some of these nematodes may have major roles in decomposition, including biodegradation of toxic compounds. Insect-parasitic nematodes can be of importance in regulating insect populations, and are being used in the biological control of insect pests e.g. *Steinernema* spp.

Disease Cycle

The J1 stage resides entirely inside the translucent egg case, where it molts into a J2 nematode. The motile J2 stage is the only stage that can initiate infections. J2s attack growing root tips and enter roots intercellularly. Nematode secretions cause dramatic physiological changes in the parasitized cells, transforming them into giant-cells. If the nematode dies, so will the giant-cells upon which it feeds. J2s do not possess reproductive organs. Root-knot nematodes undergo four juvenile stages, each progressing through a "molting" process similar to that of insects. As a result of this process, juvenile root-knot nematodes have little resemblance to adult males and females. In the J4 stage, the progression from juvenile to globose adult females or to vermiform adult males becomes clearly visible. They emerge as adults from the J4 cuticle.

QUESTION # 1: At what stage nematodes initiate infection?

QUESTION # 2: What is the difference between juvenile and larva of insect?

QUESTION # 3: How much time nematodes require for completing their life cycle?