

A SURVEY OF CYST NEMATODES (*HETERODERA* SP.) IN NORTHERN EGYPT

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Information concerning the occurrence and distribution of cyst nematodes (*Heterodera* sp.) in Egypt is important to assess their potential to cause economic damage to many crop plants. A nematode survey was conducted in Alexandria and El-Behera Governorates in northern Egypt during 2001 to 2006 to identify the species of cyst nematodes (*Heterodera* sp.) associated with some crop plants and grasses. A total of 162 soil and root samples were collected from the rhizosphere region of the surveyed plants and at a depth of 15-40 cm. Roots were washed free of soil and examined for female and cyst nematode infection. Nematodes from a composite sample of 250 cm³ soil were extracted by means of Cobb's wet-sieving and centrifugal sugar floatation techniques (Ayoub, 1980). Nematodes were fixed in 2 % formaldehyde solution, identified to genus, and counted under a binocular stereomicroscope. Females were removed from the roots and cysts were sieved from soil, after which juveniles were hatched from cysts kept in water in a Syracuse watch glass in the laboratory. The procedures used for preparing and measuring specimens were essentially same as used by Golden & Birchfield (1972). Nematode identifications were based on the morphology of second-stage juveniles, adult females, and cysts and their identities were confirmed with taxonomic keys (Mulvey & Golden, 1983; Golden, 1986). Morphological characters used for identification included cyst shape, characteristics of cyst terminal cone including nature of fenestration, vulval-slit length, shape and presence or absence of bullae, underbridge length, and cyst wall pattern. The second-stage juvenile morphologies critical for identifications were the following: body and stylet length, shape of stylet knobs, shape, and length of tail and hyaline tail terminus. Nematode population density (nematodes per 250 g soil) was determined for each species and recorded. Frequency of occurrence (FO) and population densities of cyst nematode species (*Heterodera* sp.) and associated host plants in Alexandria and El-Behera governorates are given in Table 1.

The results showed the occurrence of *Heterodera avenae* Wollenweber, 1924 on barley (*Hordeum vulgare* L.) and wheat (*Triticum aestivum* L.); *H. zaeae* Koshy *et al.*, 1971 on corn (*Zea mays* L.); *H. daverti* Wouts & Sturhan, 1979 on

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Egyptian clover (*Trifolium alexandrinum* L.); *H. trifolii* Goffart, 1932 on Egyptian clover and wheat; *H. schachtii* Schmidt, 1871 on cabbage (*Brassica oleracea* L. var. *capitata*); *H. lespedezae* Golden & Cobb, 1963 on Egyptian clover; *H. rosii* Duggan & Brennan, 1966 on annual yellow sweet clover (*Melilotus indica*) and *H. goldeni* Handoo & Ibrahim, 2002 on Qasabagrass (*Panicum coloratum*). This detection represents new country records for *H. lespedezae* and *H. schachtii* in Egypt. Also, survey results showed new host plant record for *H. trifolii* on wheat in Egypt. Previous studies showed the occurrence of *H. cajani* on cowpea (Aboul-Eid & Ghorab, 1974); *H. glycines* on Egyptian clover, cowpea and tomato (Elmiligy, 1968; Ibrahim *et al.*, 1986; Ibrahim, 1990; Ibrahim & El-Sharkawy, 2001); *H. zae* on corn (Aboul-Eid & Ghorab, 1981) and *H. goldeni* on Qasabagrass (Handoo & Ibrahim, 2002).

Table 1. Frequency of occurrence (FO) and population densities of cyst nematode species (*Heterodera* sp.) and associated host plants in Alexandria and El-Behera governorates, Egypt.

Location	Host Plant	No. of soil samples	Nematode species	FO %	Population density*
Abees, Alexandria	Clover**	14	<i>H. trifolii</i>	43	220
Abees, Alexandria	Corn	14	<i>H. zae</i>	50	320
Abees, Alexandria	Wheat	14	<i>H. trifolii</i>	36	260
El-Amria, Alexandria	Cabbage	20	<i>H. schachtii</i>	45	320
El-Maamora, Alexandria	Qasabagrass	16	<i>H. goldeni</i>	44	364
Khorshed, Alexandria	Clover**	12	<i>H. daverti</i>	42	180
El-Sabaheya, Alexandria	Clover**	14	<i>H. lespedezae</i>	36	210
El-Sabaheya, Alexandria	Wheat	12	<i>H. zae</i>	33	260
Rashid, El-Behera	Barley	15	<i>H. avenae</i>	27	210
Rashid, El-Behera	Wheat	16	<i>H. avenae</i>	38	240
Rashid, El-Behera	Annual yellow sweet clover	15	<i>H. rosii</i>	33	280

* Number of cyst nematode juveniles / 250 cm³ soils

** Clover: Egyptian clover (*Trifolium alexandrinum*)

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