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OCCURRENCE OF RACES OF *HETERODERA CAJANI* IN UTTAR PRADESH, INDIA

by

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Summary. Fourteen populations of *Heterodera cajani* from different localities of seven districts of Uttar Pradesh, India were tested on nine different hosts to determine occurrence of races of pigeonpea cyst nematode. The results revealed the presence of three races. Race 1 reproduced on all the host tested. Race 2 did not reproduce on *Cyamopsis tetragonoloba* while race 3 did not reproduce on *C. tetragonoloba* and *Crotalaria juncea*.

The pigeonpea cyst nematode, *Heterodera cajani* Koshy 1967 is an important pest of pulses and some other plants. It is reported from several states of India and causes considerable damage (Sharma and Swarup, 1984). An extensive survey of cyst nematodes in Uttar Pradesh, India, revealed a high frequency and infestation level of *H. cajani* (Husain *et al.*, 1989).

Two races of *H. cajani* have been reported to occur in some states of India (Walia and Bajaj, 1986, 1988) but a study of the races in Uttar Pradesh has not yet been done. A knowledge of races and their occurrence is of prime importance for formulating rotations involving non-hosts and resistant cultivars and for developing a breeding programme. Therefore, populations of *H. cajani* from Uttar Pradesh were tested using a range of potential leguminous hosts.

Materials and methods

Fourteen different populations of *Heterodera cajani* were collected from seven districts of Uttar Pradesh and single cyst cultures of the populations were established on pigeonpea, *Cajanus cajan* (L.) Millsp. (cv. UPAAS-120).

The nematode was later identified using cone top, male and juvenile characters as described by Koshy *et al.* (1971).

Seeds of nine differential hosts namely *Cajanus cajan* (cv UPAAS-120); *Crotalaria juncea* L. (cv. Local); *Cyamopsis tetragonoloba* (L.) Traub (cv. HG-258); *Dolichos purpureus* L. (cv. HD-18); *Sesamum indicum* L. (cv. HT-6); *Sesbania aculeata* Pers (cv. Local); *Vigna aconitifolia* Jacq. (cv. Local); *Vigna mungo* (L.) Hepper (cv. K-851) and *Vigna unguiculata* (L.) Walp. (cv. FS-68) were sown in 15

cm clay pots containing 1 kg steam sterilized soil. After germination one seedling per pot was maintained. One week after germination single plants were separately inoculated with 1000 second stage juveniles of each population of *H. cajani*. Each set was replicated six times.

Two months after inoculation the plants were gently taken from pots and soil was processed through 100 mesh sieve. Roots and suspension with soil collected from the sieves were examined for cysts using a stereomicroscope. Presence of cysts indicated that reproduction had occurred (+); if no cysts were found it was assumed the plant was not a host (-).

Results and discussion

The single cyst populations from Bilhaur, Ghatampur, Kannauj, Jaswantnagar and Phaphund reproduced on all the nine hosts (Table I). Those from Sandi, Bilgram and Malihabad reproduced on all except *Cyamopsis tetragonoloba* while the populations from Shafipur, Bangarmau, Mohanlalganj, Bindki and Khaga reproduced on all but *C. tetragonoloba* and *Crotalaria juncea* (Table I).

The six populations which reproduced on all of the hosts were designated as race 1, the three populations which did not reproduce on *C. tetragonoloba* were named as race 2. The five populations which did not reproduce on *C. tetragonoloba* and *C. juncea* were designated as race 3. During a survey of cyst forming nematodes the plants tested for thost status were found mostly growing in the surveyed area and were infested with *H. cajani* (Husain *et al.*, 1989). Results of differential hosts clearly show three races of *H. cajani* while Bajaj and Walia (1986, 1988) reported only two races of *H. cajani* from

TABLE I - Reaction of fourteen populations of *Heterodera cajani* from different localities in Uttar Pradesh on nine leguminous plant species.

District Locality	Plant species								
	<i>Cajanus cajan</i> (UPAAS-120)	<i>Crotalaria juncea</i> (Local)	<i>Cyamopsis tetragonoloba</i> (HG-258)	<i>Dolichos purpureus</i> (HD-18)	<i>Sesamum indicum</i> (HT-6)	<i>Sesbania aculeata</i> (Local)	<i>Vigna aconitifolia</i> (Local)	<i>Vigna mungo</i> (K-851)	<i>Vigna unguiculata</i> (FS-68)
Kanpur									
Bilhaur	+	+	+	+	+	+	+	+	+
Ghatampur	+	+	+	+	+	+	+	+	+
Farrukhabad									
Kannauj	+	+	+	+	+	+	+	+	+
Kaimganj	+	+	+	+	+	+	+	+	+
Unnao									
Shafipur	+	-	-	+	+	+	+	+	+
Bangarmau	+	-	-	+	+	+	+	+	+
Hardoi									
Sandi	+	+	-	+	+	+	+	+	+
Bilgram	+	+	-	+	+	+	+	+	+
Etawah									
Jaswantnagar	+	+	+	+	+	+	+	+	+
Phaphund	+	+	+	+	+	+	+	+	+
Lucknow									
Malihabad	+	+	-	+	+	+	+	+	+
Mohanlalganj	+	-	-	+	+	+	+	+	+
Fatehpur									
Bindki	+	-	-	+	+	+	+	+	+
Khaga	+	-	-	+	+	+	+	+	+

+ = Reproduction occurred; - = No reproduction; () = Cultivar.

other states of India. In their study they too realized the possibility of more than two races of *H. cajani*. Although only three plants (*C. cajan*, *C. tetragonoloba* and *C. juncea*) responded to differential hosts and the other six plants gave same reaction to all the populations. The use of these supplementary plants supports the assumption that only three races of *H. cajani* occur in Uttar Pradesh, India.

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