

# STYLET BEARING NEMATODES ASSOCIATED WITH WALNUT (*Juglans regia* L.) IN DISTRICT ABBOTTABAD

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**Abstract:** Identification of stylet bearing nematodes associated with walnut (*Juglans regia* L.) in different localities namely Baghnotar, Nathiagali, Kakul, Bandi Pulah, Gulistan Colony, Sheikh ul Bandi and Jhangi of District Abbottabad, KPK, Pakistan have been presented. Soil samples were collected from the base of the walnut trees and were processed by using Bearmann funnel technique. Specimens collected were killed by heat, fixed in TAF and later transferred to 1.25 glycerine for permanent mounting. Nine species of nematodes *Tylenchus* sp., *Psilenchus hilarulus*, *Meloidogyne* larvae, *Aphelenchus avenae*, *Tylenchus juveniles*, *Filenchus sheri*, *Pratylenchus thornei*, *Helicotylenchus pseudorobustus* and *Helicotylenchus dihystra* have been identified from these localities. Most commonly found nematode species were *Aphelenchus avenae*, *Psilenchus hilarulus*, *Tylenchus* sp. and *Pratylenchus thornei*.

**Key Words:** Nematodes, Walnut, Abbottabad

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## INTRODUCTION

Walnut (*Juglans regia* L.) is an important nut crop found in different localities of Pakistan. In District Abbottabad it is found both in domesticated and wild conditions. Pakistan is situated between 24.50 and 36.75 latitude north and 61 to 75.5 longitude east country located in the mountainous region adjoining Central Asia and Middle East. The walnut trees are usually grown on terraces, beds of streams and at foothills with no horticulture management like pruning, spraying against insects, pests and diseases and manuring at proper time (Khan *et al.*, 2002).

Walnut trees are attacked by several insects and pests including nematodes of economic importance. Several workers have reported nematodes associated

with walnut trees (Askar *et al.*, 2012; Leila *et al.*, 2009; Mazdosht *et al.*, 2005; Zaki and Mantoo, 2003; Tahiri., 2001; Liskova *et al.*, 1998) from different parts of the world. In Pakistan, the very first report available on nematodes associated with walnut is by Khan and Bilqees in 1993 in Bajaur Agency. They identified eleven nematode genera. Later Khan and Shaukat in 2000 conducted a survey in Swat and reported eleven nematode species from different localities. As the walnut trees are of great economic importance, this survey is carried out in District Abbottabad, KPK, Pakistan for the identification of stylet bearing nematodes associated with walnut.

## **MATERIALS AND METHOD**

Forty soil samples were collected during May, 2012 from different localities of District Abbottabad, KPK, Pakistan. The localities were Baghnotar, Kakul-1, Kakul-II, Bandi Pulah-I, Bandi Pulah-II, Nathiagali-1, Nathiagali-II, Gulistan Colony, Sheikh ul Bandi and Jhangi. The samples were collected from the depth of 0-60cm depending on the tree size. The soil was loamy and clayey. Nematodes were extracted from collected soil samples by using modified Baermann funnel technique (Southey, 1970). Isolation was done by using Pasteur pipette. Specimens collected were killed by heat and then fixed in TAF (Courtney *et al.*, 1955) and later transferred to 1.25 glycerin for permanent mounting. Glycerin is a long lasting medium suitable for making permanent mounts (Bezooijen, 2006). Permanent mounting was done by placing ribbons of paraffin wax around the glycerin drop with a specimen and cover it with a

clean cover slip of about 19mm diameter (Islam, 2007). Qualitative analysis was done under the stereoscopic microscope.

## RESULTS AND DISCUSSION

Nine species of nematodes associated with walnut trees in ten localities of District Abbottabad were identified. The encountered nematodes were *Tylenchus* sp., *Psilenchushilarulus*, *Meloidogyne* larvae, *Aphelenchusavenae*, *Tylenchus* juveniles, *Filenchusseri*, *Pratylenchus thornei*, *Helicotylenchuspseudorobustus* and *Helicotylenchusdihystera*. Among them *Tylenchus* sp., *Aphelenchusavenae*, *Meloidogyne* larvae were common in surveys done by Khan and Bilqees (1993) and Khan and Shaukat (2000). *Filenchusseri*, *Pratylenchus thornei*, *Helicotylenchus pseudorobustus* and *Helicotylenchus dihystera* were not identified in early surveys.

Previously encountered nematode species were *Aphelenchus avenae* Bastin, *Basiria graminophila* Siddiqi, *Ditylenchus Filipjev*, *Filenchus Andrassy*, *Meloidogyne Goeldi*, *Macroposthonia pruni*, *Pratylenchus penetrans*, *Psilenchus minor*, *Tylenchorhynchus capitatus* Allen, *Tylenchus Bastian*, *Xiphinema basiri* Siddiqi from different localities of Bajore Agency, Khyber Pukhtun Khawa, Pakistan by Khan and Bilqees in 1993. Later Khan and Shaukat (2000) identified *Aphelenchus avena*, *Basiria bajorensis*, *B. graminophila*, *Meloidogyne* sp. Larvae, *Merlinius microdorus*, *Ottolenchus* sp. Larvae, *Pratylenchus penetrans* and *Psilenchus minor* from different localities of Swat district.

Among the encountered species from Abbottabad *Pratylenchus thornei* and *Meloidogyne* larvae are of great economic importance s they are root lesion and root knot species and causes great damage to the host trees. Effective measures for their control are requires to reduce economic damage.

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**Table.1. Table showing presence/absence of nematode species in different localities of District Abbottabad**

<b>NEMATODES</b>											
LOCALITIES	<i>Tylenchus</i>	<i>Filenchus</i>	<i>Helicotylenchus</i>	<i>Psilenchus</i>	<i>Aphelenchus</i>	<i>Pratylenchus</i>	<i>Helicotylenchus</i>	<i>Tylenchus</i>	<i>Meloidogyne</i>		
	<i>spp.</i>	<i>sheri</i>	<i>pseudorobustus</i>	<i>hilarulus</i>	<i>avenae</i>	<i>thornei</i>	<i>dihystera</i>	juveniles	larvae		
Bagnetar	+	-	-	-	-	-	-	+	-		
Kakul-I	-	+	+	+	-	+	-	-	+		
Kakul-II	+	-	+	-	-	+	-	-	-		
Bandi Pulah-I	-	-	-	+	-	-	+	-	-		
Bandi Pulah-II	-	-	-	-	+	-	-	-	-		
Nathiagali-I	+	-	-	+	-	+	-	-	-		
Nathiagali-II	-	-	-	-	+	-	+	-	-		
Gulistan Colony	-	-	-	-	+	-	-	-	-		
Sheikh-ul-Bandi	-	-	-	+	-	-	-	+	-		
Jhangi	-	-	+	-	+	-	-	+	-		

## CONCLUSION

It is clear from the identified species that in Abbottabad plant parasitic nematodes are damaging the walnut trees. This damage to trees results in yield loss and poor plant growth and health, causing loss to the farmers. Since the environmental conditions are suitable for the reproduction and growth of nematodes, preventive measures are required. Many economically important species were present which are damaging the plant. Awareness, identification, treatment and control of nematodes are important for enhancing the yield, plant growth and production.

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