Parasitic association of root-knot nematode, Meloidogyne incognita on guava

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Abstract

The root knot nematode, Meloidogyne spp. are considered to be one of the most important pest problems with a wide host range of crops throughout the tropics and subtropics. They reduce crop yield and quality of guava. Nematode infestation is one of the most important factors contributing to low productivity of crops. Recently root-knot nematode was observed to attack guava roots in orchards growing in and around Aligarh district of Uttar Pradesh. Nematode attacked plant exhibited stunting, yellowing, dieback and patchy growth. However, root system showed numerous small to big size galls. The specific identity of the nematode was determined by cutting perineal pattern of the females. The present investigations have clearly indicated that the association of root knot nematode, Meloidogyne incognita with guava is highly pathogenic in nature. Parasitic association of Meloidogyne incognita may pose a serious threat to guava trees, if the management practices are not governed to keep the population under check. Therefore, it needs immediate attention of the growers and researcher to manage the damage to guava trees infested with nematodes.

Keywords: Aligarh, Guava, Perineal pattern, Phytonematodes.

Introduction

Guava (Psidium guajava L.), belonging to the Family Myrtaceae, is originated in the tropical South America (Hayes 1970; Pathak and Ojha 1993) and grows wild in Bangladesh, India, Thailand, Brazil, Florida, West Indies, California and also in several other countries (Bailey, 1960). India is one of the major guava producing countries of the world. It is grown through out the country in home gardens and in Agroforestry production systems. In India, the important guava growing states are Uttar Pradesh, Bihar, Assam, MaharaA Novel Technique for Automatic Modulation Classification and

Time-Frequency Analysis of Digitally Modulated Signals stra, West Bengal, Andhra Pradesh and Madras. It plays a vital role in fulfilling the vitamin C deficiency among the people of the country (BBS, 2000) since 100 g of fruit contains about 260 mg of vitamin C (Pandis 1970; FAO 1984; Rahman et al., 2003), which is 2–5 times higher than the fresh orange. The barks and leaves of the trees posses some medicinal values. Roots and young leaves are astringent, extremely useful in strengthening the stomach. The wood is hard and tough (Drurey 1985), used as posts for rural house buildings. Tannin and dye can be made from the leaves (Siddiki and Ali, 1994). Among several biotic and abiotic stresses inflicting damage to guava, plant parasitic nematodes constitute one of the major constraints for its profitable cultivation. Nematodes are of serious concern for guava planters particularly for its association with ‘guava decline’.

Phytonematodes have been recognized as one of the limiting factors in the normal production in several important crops including fruits, vegetables and ornamental plantations all over the world. In India, the annual loss inflicted by pests, nematodes and weeds is estimated at Rs. 6000-17000 crores. Unawareness of the hidden enemy makes the farmer to suffer high yield loss. In present manuscript, emphasis has been to identify the species of root knot nematodes, Meloidogyne spp., recovered from the guava root system.

Materials and Methods

Root samples along with adhered soil were collected from the rhizosphere of guava orchards, growing in and around Aligarh. Adequate investigations of roots for galling lesions caused by nematodes were performed. Thereafter, procedure given by Goodey (1963) was adopted for study; the galled root systems from the infested plants were first washed in water and immersed in a beaker containing boiling 0.1 percent cotton blue and left over night for clearing. The female nematodes were teased out from the galls and transferred to a drop of lactophenol taken on a clean glass slide. The posterior portion of the females was carefully cut with a sharp razor blade and body contents were cleaned up. The perineal pattern was trimmed and mounted for observation. At least thirty slides were prepared containing the perineal pattern, stylet length, head shape and juvenile length of the nematode. The identification of the species was made by comparing the observed characteristics in the perineal region with description given by Eisenback et al., (1981).

Results and Discussion

The present investigations based on perineal pattern, stylet length, head shape and juvenile length studies concluded that the said root-knot nematode was Meloidogyne incognita. This is the first report of parasitic association of Meloidogyne incognita on guava from Aligarh, Uttar Pradesh. Parasitic association of M. incognita with guava (Babatola and Oydunmade, 1992), incidence and damage due to root-knot nematode has been reported from Brazil (Moura et al., 1989). Involvement of Meloidogyne Spp. and other soil borne fungi (Saurez et al., 1999) has also been reported with high incidence of guava decline. Hence, keeping in mind the importance of the disease of guava further research work on systemic survey, pathogenicity, identification of various nematodes and its management need to be initiated.

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