*Research Paper :*

# Studies of root-knot nematode, *Meloidogyne incognita* and leaf spot disease of okra and their management by *Pseudomonas fluorescens*

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## SUMMARY

***Pseudomonas fluorescens* an eco-friendly, bio control agent used for the management of phytonematodes and foliar disease and proved to be effective control over *Meloidogyne incognita* population and leaf spot disease of okra by its different treatments. The maximum value of growth parameters *viz.,* root length, shoot length, fresh root weight, fresh shoot weight and number of leaves were observed in plant grown in plots treated with *Pseudomonas fluorescens* @ 1 kg/20 kg of seeds. Root knot index was found to be maximum in $T_0$ (Control) minimum in $T_2$ (Seed treated with *Pseudomonas fluorescens* 1 kg/ 20 kg of seeds) followed by $T_1$ (Seed treated with *Pseudomonas fluorescens* @ 500 kg/20 kg of seeds). The leaf spot disease was found to be maximum in $T_0$ (Control) and minimum in $T_4$ (Foliar spray of *Pseudmonas fluorescens* @ 4 kg/ha) followed by $T_3$ (Foliar spray of *Pseudomonas fluorescens* @ 2 kg/ha).**

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Okra (*Abelmoschus esculentus*), an annual vegetable crop belongs to the family Malvaceae, a South African native, grown in tropical and sub tropical parts of world. Fruit of okra used as vegetable contain high iodine content which helps to control goiter and the fibrous parts are used in paper industries.

Infestation of root knot nematode (*Meloidogyne* spp.) is one of the major constraints in the production of okra. The most widely prevalent species are *M. javanica, M. incognita* and *M. arenaria*. They infest a large number of crops espically vegetables like tomato, chilli, okra, egg plant, carrot, beans etc. and cause direct damage to the root system of plant (Ibrahim and Massoud, 1974).

Okra is also affected by leaf spot disease caused by *Cercospora* spp. The mycelium of *Cercospora* spp. consists of multicellular septate and branched hypha (both inter and intracellular). An eco-friendly approach, a gram negative, *Pseudomonas fluorescens* has emerged as potential most promising rhizobacterium which manages plant parasitic nematodes by soil inoculants and also manages leaf spot disease by foliar application. *Pseudomonas fluorescens* is economical compatible with bio-fertilizer and acts as plant growth promoting rhizobacterium (PGPR). So, the present investigation was undertaken to study the efficacy of *Pseudomonas fluorescens* on root knot nematodes (*Meloidogyne incognita*) on leaf spot disease and growth parameters of okra.

## MATERIALS AND METHODS

The plant material used of okra cultivar was Arka Abey (seed rate 20 kg/ha) okra variety sponsored by unique seed co-operation with purity (98%) and germination (70%). Seeds were treated with *Pseudomonas fluorescens* talc based powder formulation. An experiment was conducted to evaluate its efficacy against root-knot nematode infestation and leaf spot disease. The experiment was conducted at the farm of Allahabad Agriculture Institute. The land was prepared well and all agronomical operations were done before sowing. The field was divided into 5 treatments with 4 replications. The plot size of each replicate was 2x2 $m^2$ having spacing of 30 cm