

Original Research Article

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Effect of Various Dosages of Castor (*Racinius communis*) Leaves on Okra (*Abelmoschus esculentus*) Under Screen House Conditions

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ABSTRACT

Keywords

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Studies were carried out at screen house of department of Nematology to evaluate the different dosages of castor leaves against root-knot nematode, *Meloidogyne incognita* in okra. Plant growth parameters improved due to addition of chopped castor leaves. Maximum and significantly highest shoot length (30.4) and root weight (3.44) was found when individual pot was added with 25 grams of leaves. Maximum reduction in number of galls (6.80) was found in castor leaves @ 25 g per pot it also reduced number of egg mass (5.40). Final nematode population was found least (14.97) in chopped castor leaves @ 25 g per pot.

Introduction

Okra (*Abelmoschus esculentus*) or ladies finger is important vegetable of the tropical countries including India. Largest area and production is in India followed by Nigeria. The total area under okra in India is 0.49 mha with production of 5552 thousand tons.

The young tender fruits of okra are cooked in curries, stewed and used as soups. It is a rich source of many nutrients. A half cup of okra contains calories 25, dietary fiber 2g, protein 1.5g, carbohydrates 5.8g, vitamin A 460 IU, vitamin C 13mg, folic acid 36.5µg, calcium 50mg, iron 0.4mg, potassium 25mg, magnesium 46mg.

Crop is subjected to attack by many insects and pathogens including fungi, viruses, mycoplasmas and nematodes (Srivastava *et al.*, 2012). The most widespread and economically important are the root-knot nematodes (*Meloidogyne* spp.). Their life cycle is completed in 25 days at 27 °C. The short life cycle enables root-knot nematode populations to survive well in the presence of a suitable host and their populations build up to a maximum as crops reach maturity. In susceptible plants, the nematode population build up to a maximum usually as crop reaches maturity (Shurtleff and Averre, 2000) and in some cases the plants die even before

reaching maturity (Singh and Khurma, 2007). Root-knot nematode, *Meloidogyne incognita* causes 14.1 % yield losses in okra, this is equivalent to 480 million rupees (Jain *et al.*, 2007). Since castor is abundant in the study area, there is the need to explore its potential for the management of root-knot nematode under local conditions. This study therefore sought to evaluate the efficacy of different dosages of chopped castor leaves against root-knot nematodes and determine its effect on growth characteristics and yield of okra plants.

Materials and Methods

A pot experiment was conducted at Chaudhary Charan Singh Haryana Agricultural University, Hisar in earthen pots of 15 cm diameter. Pots were filled with sterilized soil (1 kg/pot) along with chopped fresh leaves of *Racinius communis* with different dosages viz, T₁- 5g/pot, T₂-10 g/pot, T₃-15 g/pot, T₄-20 g/pot, T₅-25 g/pot and T₆-untreated check. Thus, 6 treatments were tried in Completely Randomized Design keeping 4 replications.

Proper moisture was ensured for decomposition of leaves. After 7 days of waiting period, 5-7 seeds of okra cv. Varsha uphar were sown/pot. 800j2/pot of *Meloidogyne indica* were inoculated after 17 days of sowing of seed. Watering and plant protection measures were taken as per the requirement. The plants were removed carefully after 45 days of sowing and observations were recorded and analyzed.

Results and Discussion

The data in Table 1 revealed the efficacy of castor (*R. communis*) leaves against *M.incognita* infesting okra plants in pot

conditions. It is evident that shoot length increased in all treatments as compared to untreated check.

Maximum and significantly highest shoot length was recorded in castor leaves @ 25g/pot (30.4 cm) followed by castor leaves @ 20g/pot (28.5 cm), castor leaves @ 15 g/pot (24.2 cm), castor leaves @ 10g/pot (20.9 cm) and castor leaves @ 5 g/pot (20.4 cm).

Results of this study are in conformity with those of Kankam *et al.*, 2015 who found that under screen house condition aqueous extract of *Sesamum indicum* at 30 g/50 ml suppressed root-knot nematodes better than the control in okra.

Similarly, maximum and significantly highest root weight was recorded in castor leaves @ 25g/pot(30.4 g) followed by Castor leaves @ 20g/pot (28.5 g). This might be due to additional manorial effect of the tested plant leaves which nourishes okra seedlings. At lower dosages of leaves i.e. castor leaves @ 5 g/pot and castor leaves @ 10 g/pot data on root weight shows that there was no significant difference between these two treatments.

The data pertaining to number of galls shows that all the treatments were effective in reducing number of galls per plant.

The results obtained by Rather and Siddiqui (2007) and Javed *et al.*, (2008) are in line with our findings. Minimum number of galls was recorded in castor leaves 25 g/pot (46) followed by castor leaves 20 g/pot (53). However there was no significant difference in number of galls in treatments i.e. castor leaves @ 5 g/pot and castor leaves @ 10 g/pot.

Table.1 Effect of various dosage of *Ricinus communis* on growth parameters of okra seedling and development of root-knot nematode, *Meloidogyne incognita*

Treatments	Shoot length (g)	Root weight (g)	Number of galls/plant	No of egg masses/plant	Final nematode population/200 cc soil
Castor leaves @ 5 g/pot	20.4	2.71	92.00 (9.61)	60.00 (7.74)	413.00 (20.34)
Castor leaves@ 10 g/pot	20.9	2.74	87.00 (9.32)	56.00 (7.48)	384.00 (19.60)
Castor leaves@ 15 g/pot	24.2	2.99	76.00 (8.72)	49.00 (7.00)	310.00 (17.63)
Castor leaves @ 20g/pot	28.5	3.20	53.00 (7.28)	37.00 (6.08)	265.00 (16.29)
Castor leaves@ 25g/pot	30.4	3.44	46.00 (6.80)	29.00 (5.40)	224.00 (14.97)
Untreated Check	19.1	2.36	103.00 (10.16)	63.00 (7.94)	477.00 (21.85)
C.D. at 5 %	2.3	0.19	(0.34)	(0.32)	(0.78)

Figures in parenthesis are \sqrt{n} transformed values

Minimum and least number of egg masses were observed in castor leaves @ 25 g/pot (29) followed by castor leaves @ 20 g/pot (37), castor leaves 15 g/pot (49). Lower dosages of test plant @ 5 g/pot and 10 g/pot leaves were found statistically at par with each other. Similar trend was recorded in case of number of egg masses. Similarly, final nematode population reduced in all the treatments as compared to untreated check. Castor leaves @ 25 g/pot was found best for reducing final nematode population of *Meloidogyne incognita*. Alam *et al.*, 1980 suggested that the involvement of phenolic compounds absorbed systemically by the roots of tomato. Such amended tomato plants might have induced tolerance against root-knot nematode.

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