Gene action for seed yield, its attributes and wilt resistance in castor (*Ricinus comunis* L.)

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Castor (*Ricinus communis* L.) is an important non-edible oil seed crop of arid and semi-arid regions of India. Like other crops, castor also suffers from many diseases and so far 15 different diseases have been recorded in castor in India. As a result, area under the crop has tremendously increased. Due to intensive cultivation, with high inputs, high fertilizers and more number of irrigations without proper crop rotation, wilt disease started its appearance in Gujarat and now, wilt (*Fusarium oxysporum* f. sp. *ricini* Nanda and Prasad) of castor has become a serious problem in India in general and Gujarat in particular which causes serious quantitative and qualitative losses. This indicates the necessity to reduce the wilt incidence for increase the production as well as productivity. The pre-requisite for this is the knowledge of gene action because the genetic constitution of genotype is only way for the control of wilt incidence. This being the motivation , an objective was set to understand the nature and magnitude of gene action involved in controlling the complex traits like seed yield, 100 seeds weight, oil content and yield attributes which would be of considerable importance in planning a sound breeding programme. Ten parents were subjected to diallelic crosses excluding reciprocals. The data obtained indicated that dominant positive genes were responsible for the expression of these traits.

Key words : Castor, Wilt resistance, Gene action, Seed yield, Oil content

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INTRODUCTION

Aastor (Ricinus communis L.) is an important nonedible oil seeds crop of Gujarat state. In Gujarat, the common practice of castor growing is an intercrop under rain fed and as sole crop under irrigated condition. Yield potentiality of castor has considerably increased through exploitation of hybrid vigour on commercial scale and systematic varietal improvement programme. Due to intensive cultivation, with high inputs, high fertilizers and more number of irrigations without proper crop rotation, wilt disease started its appearance in Gujarat and now, wilt (Fusarium oxysporum f. sp. ricini Nanda and Prasad) of castor has become a serious problem in India in general and Gujarat in particular which causes serious quantitative and qualitative losses. As the wilt disease is primarily soil-borne, it becomes difficult to manage it through chemical or physical means. Therefore, the only practical solution of this problem lies in the breeding of host plant resistance, for which knowledge of genetics of resistance to wilt pathogen is the basic necessity. Our objective to understand the nature and magnitude of gene action involved in controlling the complex traits like seed yield, maturity, 100 seeds weight, oil content, plant height, length of primary spike, number of capsule on primary spike, number of effective branches per plant which would be of considerable importance in planning a sound breeding programme.

RESEARCH METHODOLOGY

The experimental material comprised of ten inbred lines/varieties of castor *viz.*, 48-1, SKI 321, SKI 314, JI 321, DCS 89, PCS 124, DCS 9, SKI 291, SKI 281 and SKI 215, 45 hybrids using diallel mating design excluding reciprocals and GCH-5 as standard check were evaluated in Randomized Block Design with three replications during 2007-08 and 2008-09 at Main Castor-Mustard Research Station, S.D. Agricultural University, Sardarkrushinagar in wiltsick plot. Each entry was planted in a single row of 10 dibbles keeping 90 cm row to row and 60 cm plant to plant distance. Recommended package of practices was