



## Genotype x environmental interaction and stability parameters for yield and component characters in castor (*Ricinus communis* L.)

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### ABSTRACT

The stability parameters were studied for eleven characters with 10 inbred lines with 45 hybrids developed through crossing in diallel fashion using four created environment during the crop season of the year 2007-08 and 2008-09. The value of mean square due to genotypes x environments were significant for all the characters except number of branches per plant. The linear component (G x E) was high for days to 50% flowering, days to 80% maturity, stem length, number of nodes on main stem, effective raceme length, number of capsules on primary raceme and seed yield per plant. Among the parents, 48-1 and SKI 291 were found to be stable for seed yield as well as wilt resistance. The hybrids DCS 89 x PCS 124, 48-1 x SKI 281 and SKI 291 x SKI 215 registered as stable for seed yield. On the other hand SKI 291 x SKI 281, PCS 124 x SKI 291 and SKI 281 x SKI 215 were stable and responsive to favourable environments. None of the hybrids was stable for all the characters in the same environment

**KEY WORDS :** Genotype, Environment, Inbred line, Castor, Stability

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### INTRODUCTION

The interplay of genes and environment is of vital significance in the expression of a character. Castor crop is more sensitive to environmental variations particularly differences for fertility status of soil, temperature during growth period and moisture availability. The sensitivity of castor genotypes / hybrids to environmental variations suggested the need of using array of environments instead of single environment to study the nature of gene effect controlling the inheritance of components of adaptation. In view of this, 10 parents and their 45 F<sub>1</sub> crosses developed by using diallel mating design excluding reciprocals were evaluated to study response of genotypes for seed yield and other matricate characters over four varying environments created through date of sowing (normal and late) and plot selection (normal plot and wiltsick plot)

### MATERIALS AND METHODS

The material for study comprised of 10 inbred lines selected from the germplasm were crossed in diallel mating design. The seeds of parents and 45 F<sub>1</sub><sup>s</sup> were sown on (1) August 2, 2007 in normal plot (2) August 2, 2007 in wiltsick plot (3) July 30, 2008 in normal plot and (4) July 30, 2008 in wiltsick plot The experiment was conducted at Main Castor-Mustard Research Station, S.D. Agricultural University, Sardarkrushinagar (Gujarat) during *Kharif-2007* and *Kharif-2008* in the randomized block design with three replications. Each genotype was sown in one row of 6 mt length at a distance of 120 cm between the rows and 60cm between the plants with in the row. Five plants in each genotype were selected randomly and the data on the characters were recorded for 11 characters. The statistical analysis for G x E interaction and stability parameters were carried out according to the method of Eberhart and Russell (1966).

### RESULTS AND DISCUSSION

The pooled analysis of variance for stability (Table 1) revealed that genotype as well as environments were quite different from each other. Genotypes interacted significantly in different environments for all the traits except number of branches per plant. The environment

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