Short Communication

Pakistan J. Sci. Ind. Res., Vol. 29, No. 1, February 1986

CYTOPLASMIC EFFECT FOR NON SALINE AND SALINE ENVIRONMENTS IN RICE

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(Received March 3, 1985; revised November 8, 1985)

INTRODUCTION

Efforts to breed relatively salt tolerant strains of rice have been initiated [1]. Capability of screening [2, 3] and breeding [4] genotypes which may be used as gene source for salt tolerance has also been achieved. Salt tolerance is very complexly inherited attribute [5] and little effort has been made to elucidate the mode of inheritance for salt tolerance in rice [6, 7, 8]. Therefore, it is pragmatic to study the cytoplasmic inheritance for salt tolerance. The information on the effect of cytoplasm on salt tolerance is rather scanty in rice. This prompted the present investigation to elucidate the cytoplasmic effect on salt tolerance.

MATERIALS AND METHODS

Two cultivars of rice viz. Basmati 370 and Jhona 349 were crossed in a reciprocal manner during 1982 at the Nuclear Institute for Agriculture and Biology, Faisalabad. The F_0 seed was collected the same year. The response of

Table 1. Influence of cytoplasm on yield and yield components of rice in F_1 under non-saline* and saline** environments

Name of parent/ cross	Plant height (cm)	No. of productive tillers/ plant	Panicle length (cm)	No. of primary branches per panicle	No. of grains/panicle	Panicle fertility %	Thouand grain weight (g)	Yield/plant g
Basmati 370	A 154.6 a (144.1)	A 11.4 a (7.6)	A 30.1 a (27.6)	A 11.0 a (9.2)	A 139.8 b (90.2)	A 90.1 b (72.1)	B 21.5 b (20.8)	A 21.4 b (10.1)
Jhona 349	B 126.2 b (115.1)	A 11.0 a 8.0)	C 20.7 b (19.7)	A 9.8 a (8.8)	C 81.0 c (72.2)	A 92.7 a (83.2)	A 26.0 a (25.2)	B 17.6 a (14.2)
Basmati 370 x Jhona 349	A 147.5 a (139.6)	B 6.9 b (6.0)	B 26.3 a (25.4)	A 11.9 a (10.7)	B 131.7 a (120.0)	A 89.6 a (81.5)	A 24.3 a (24.2)	B 16.8 a (14.9)
Jhona 349 x Basmati 370	A 150.5 a (143.0)	B 6.0 b (5.2)	B 26.8 a (25.4)	A 11.2 a (10.1)	B 130.1 a (118.1)	A 89.9 a 80.9)	A 24.7 a (24.5)	B 15.3 a (13.5)

* pH = 7.8 ECe = 1.7 dS/m
** pH = 8.8 ECe = 6.0 dS/m
Figures followed by the same letter (capital letters for non-saline and small letters for saline environment) are not significantly different at 5% level of significance.

the F_1 hybrids Basmati 370 x Jhona 349 and Jhona 349 x Basmati 370, together with the parental cultivars was observed under both non-saline and saline conditions during 1983. The artificial salinization of the cemented field basins (6x6x1m) was accomplished as described by Sajjad [4]. The design of the experiment was a completely randomized block design with 4 prelications. The six-week old seedlings were transplanted on both non-saline and saline field basins, maintaining the plant-to-row distance of 20 cm. The soil salinity status of saline field basins was pH = 8.8, ECe=6.0 dS/m and SAR=19.2. The soil properties of the non-saline field basins were pH=7.8, ECe=1.7 dS/m and SAR=7.7.

Data on 10 guarded plants per replication (from both habitats) were recorded for various attributes.

From the results of the present study (Table 1) it is evident that the means of both the parents of Basmati 370 and Jhona 349, for plant attributes of plant height, panicle length, number of grains per panicle, one thousand grain weight and yield per plant under both non-saline and saline environments were significantly different. On the contrary, the number of primary branches per panicle and panicle fertility behaved differently under the two environments. Such differential response of not only the cultivars [9, 10, 11] but also the plant attributes [12, 2, 3 4] to saline condition in rice is on record. There was no differences in the means of both reciprocal hybrids under the environments for almost all the plant attributes studied.

CONCLUSION

The results of the present study may indicate the absence of extra genic basis of salt tolerance in rice.

Acknowledgement. The generous help of Messers G.R. Tahir and Javed Iqbal for statistical analysis is acknowledged with thanks.

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