





















**Table 4.** Estimates of correlation coefficients between different characters in rice genotypes under irrigated condition (IC) and reproductive stage drought stress condition (RSS).

Characters	Situation	PH	Biomass	RWC	PC	SPC	LR	LD	ST	SRR	HI	GY
PH	IC		0.311*	0.114	-0.225	0.110	----	----	-0.081	---	0.071	0.159
	RSS		0.218	0.073	-0.187	0.093	0.165	0.208	0.104	0.073	0.038	0.106
Biomass	IC			0.345*	0.289*	0.296*	----	----	-0.059	---	-0.096	0.297*
	RSS			0.419*	0.367**	0.351*	-	-0.324*	0.172	0.237	-0.077	0.327*
RWC	IC				0.239	0.303*	----	----	0.104	---	0.187	0.341*
	RSS				0.341*	0.381*	-	-0.377**	-	0.261	0.205	0.428**
Proline content	IC					0.219	----	----	-0.134	---	0.057	0.311**
	RSS					0.294*	0.411*	0.457*	-0.165	0.197	0.226	0.386**
Soluble protein content	IC						---	---	-0.267	---	0.119	0.274*
	RSS							0.176	-	0.106	0.245	0.337**
LR	IC						0.234		0.302*			
	RSS							0.385*	0.255	0.059	-	-
LD	IC								---	---	---	---
	RSS								0.327*	0.117	-	-
ST	IC									---	0.284*	0.388*
	RSS									-0.266*	-0.196	-0.142
SRR	IC										0.207*	0.327**
	RSS										---	---
HI	IC										0.241	0.309*
	RSS											0.362*
												0.451**

IC (irrigated condition), RSS (reproductive stage drought stress condition), PH (Plant Height), RWC (relative water content), PC (proline content), SPC (soluble protein content), LR (Leaf rolling), LD (Leaf drying) ST (Sterility %), SRR (Stress recovery rate) HI (Harvest index) and GY (Grain Yield (t ha<sup>-1</sup>)) \*- significant at 5%, \*\* - significant at 1%

reported the similar kind of results for proline content in rice under water stress condition.

### **Relationship between yield and yield attributes under moisture stress (drought) and non-stress (irrigated) condition**

In this study, inter-relationship between grain yield and its contributing traits were determined by correlation matrix. Grain yield was significantly and positively correlated with harvest index, biomass and test weight under both drought stress and non-stress irrigated condition (Table 4). Girish *et al.*, (2006) and Murthy *et al.*, (2011) also found significant and positive correlation between grain yield and panicle number and effective tiller number. Grain yield was found to be significantly and negatively correlated with leaf rolling, leaf drying and spikelet sterility under drought stress condition. Drought related parameter leaf rolling and leaf drying is significantly and negative correlated with RWC and plant biomass whereas positively correlated with proline content (Table 4). Stress recovery rate was negatively correlated with spikelet sterility. Significant positive correlations was also observed between proline content, soluble protein content and relative water content with grain yield under reproductive stage water stress condition. Beena *et al.*, (2012) also found significant and positive correlations between proline content, soluble protein content, chlorophyll stability index, stress recovery and relative water content with biomass under drought stress.

From this study, it was concluded that moisture stress imposed during reproductive stage significantly reduced rice yield in all genotypes. The differential responses of genotypes to imposed water stress condition indicate the drought tolerance ability of rice genotypes. This study also indicated that selection based on drought tolerance indices DTE, SSI, STI and TOL will results in the identification of drought tolerant genotypes with significantly superior and stable performance of yield and yield attributes physiological and biochemical traits over current cultivated varieties under water stress condition in rain-fed lowland drought prone ecosystem. IR 84895-B-

B-127-CRA-5-1-1, IR83387-B-B-40-1, IR 83376-B-B-24-2, IR83373-B-B-24-3 and IR55419-04 showed high DTE and STI values and low SSI and TOL values, identified as high yielding drought tolerant genotypes. They showed highest yield under normal irrigated condition and good yield under drought condition through better maintenance of desired physiological and biochemical activities under drought stress situation. These drought tolerant rice genotypes can be adopted in large area in rain-fed lowland ecosystem where drought is frequent, particularly during reproductive stage.

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