

**EVALUATION OF THE SALINITY TOLERANT  
CAPACITY OF SELECTED RICE (*Oryza sativa* L.)  
CULTIVARS GROWN ON SOILS FROM SALINE  
TRACT OF BATTICALOA**



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## ABSTRACT

Salinity is a major factor reducing plant growth and productivity in rice cultivation. The development of salt resistant rice cultivars has become an urgent priority because of the increased salinity in rice lands. This experiment was conducted at the Agronomy farm of the Eastern University, Sri Lanka to assess the responses of salinity on the growth, physiological and yield attributes of selected rice cultivars. Three cultivars of rice namely: "Pachaiperumal", "At 307" and "At 308" were used for this study. The experiment was laid out in the Completely Randomized Design with two factor (salinity\*variety) in a factorial arrangement and consisted of six treatments and four replications. A set of 3 weeks old rice seedlings were subjected to salt stress by transplanting them in polyethylene bags. These bags were filled with saline soil collected from a saline tract near the Eastern University.

Forty eight plants from each cultivar were evaluated for the selected characters such as plant height, Relative Water Content of leaves, chlorophyll contents, number of reproductive tillers per plant and other yield attributes. Salt stress significantly affected the growth physiological attributes of the tested cultivars. "At 307" exhibited the highest height (58.5cm) when exposed to salinity at the vegetative stage while "Pachaiperumal" showed the highest height (132.8 and 124.6cm) during the reproductive and ripening stages respectively than the rest of the cultivars.

"Pachaiperumal" showed the highest root dry weight at all three stages of growth while "At 307" exhibited the highest shoot dry weight at all three growth stages under salt stressed condition. Salt stress significantly reduced the Relative Water Content of the tested cultivars. Cultivar "Pachaiperumal" contained the highest Relative Water Content (66.8%).

“At 307” and “At 308” showed the highest amount of “chlorophyll a”, “chlorophyll b” and “total chlorophyll” contents of rice leaves under salt stress while “Pachaiperumal” had lowest amounts of these pigments. “At 307” and “At 308” showed the lowest leaf number and leaf width while “Pachaiperumal” had the highest leaf number and leaf width during the ripening stage.

The results indicated that salinity significantly reduced the number of tillers per plant, number of productive tillers per plant, number of filled grains per panicle and total number of spikelets per panicle. The percentage of unfilled grains was increased in plants under salt stress than the control treatment. All these results indicated that cultivar “At 307” was able to withstand salinity stress much better than the other rice cultivars and was identified as a salt tolerant cultivar. As a result, it was recognized as the most salinity tolerant rice cultivar among the tested ones which could be grown in the salinized tracts of the Batticaloa district.

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