

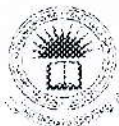
**IMPACT OF SALT STRESS ON THE
GROWTH, PHYSIOLOGY AND YIELD OF SELECTED
BRINJAL (*Solanum melongena* L.) CULTIVARS**



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ABSTRACT

Brinjal is grown in the Batticaloa district to limited extent; as it is highly susceptible to salt stress. This experiment was conducted at the Agronomy farm of the Eastern University, Sri Lanka. Studies were made to evaluate salt stress tolerance of selected brinjal cultivars; 'Thirunelvely Purple', 'Palugamum White' and 'Padagoda (BW11)' when the stress was imposed fourteen days after transplanting and to determine the most suitable brinjal cultivar which can resist salt stress and produce substantial yield. This experiment was laid out in the Randomized Complete Block Design with six treatments and four replications and the treatments were arranged in 3×2 factorial manner. Up to fourteen days after the transplanting regular watering was done by tap water. Then treatment plants were watered by salt water once in two days and the control plants were watered by tap water once in two days.

There were significant ($p < 0.05$) differences between treatments in the measured physiological and growth attributes. Salt stress significantly ($p < 0.05$) increased the proline content of all the tested brinjal cultivars. The highest amount of proline (6.94 mgg^{-1}) was noticed in 'Thirunelvely Purple' brinjal cultivar and the lowest (2.42 mgg^{-1}) was found in the 'Palugamum White' brinjal cultivar.

Salt stress significantly reduced the amounts of chlorophylls. The highest amounts of chlorophylls (a 0.98 mgg^{-1} , b 0.8 mgg^{-1} and total chlorophyll 1.75 mgg^{-1}) contents were observed in 'Thirunelvely Purple' brinjal cultivar and the lowest amounts (Chlorophylls a 0.49 mgg^{-1} , b 0.3 mgg^{-1} and total chlorophyll 0.87 mgg^{-1}) were recorded in 'Palugamum White' brinjal cultivar.

Salt stress significantly ($p < 0.05$) reduced the Relative Water Contents (RWC) of all the tested brinjal cultivars. The highest RWC (72.3) was noticed in 'Thirunelvely Purple' brinjal cultivar where the lowest (29.7) was obtained in 'Palugamum White' brinjal cultivar. Salt stress significantly ($p < 0.05$) reduced the shoot length of all the tested cultivars. The highest and the lowest shoot length were observed in 'Thirunelvely Purple' and 'Palugamum White', respectively.

Salt stress significantly ($p < 0.05$) reduced the Leaf Area Index (LAI), plant dry weight and number of branches per plant. The highest LAI (0.56) was noticed in 'Thirunelvely Purple' brinjal cultivar where the lowest (0.15) was obtained in 'Palugamum White' brinjal cultivar. The highest plant dry weight (17.18g) was observed in 'Thirunelvely Purple' brinjal cultivar where the lowest (6.42g) was obtained in 'Palugamum White' brinjal cultivar. The highest number of branches were observed in 'Thirunelvely Purple' brinjal cultivar where the lowest were recorded in 'Palugamum White' brinjal cultivar.

Salt stress significantly ($p < 0.05$) reduced the yield and yield components (fruit length and fruit girth). The highest fruit length (15.8cm) was obtained in 'Thirunelvely Purple' brinjal cultivars and the lowest (6.1cm) was recorded in 'Palugamum White' brinjal cultivars. The highest fruit girth (14.3cm) was obtained in 'Thirunelvely Purple' brinjal cultivars and the lowest (4.1cm) was recorded in 'Palugamum White' brinjal cultivars. The highest yield (22.11tonnesha⁻¹) was obtained in 'Thirunelvely Purple' brinjal cultivar and the lowest (10.15tonnesha⁻¹) was found in 'Palugamum White'.

There were also significant ($p < 0.05$) interaction between cultivars and salt stress treatments in the 'proline content', 'total chlorophyll', 'shoot length' and fruit girth of the tested cultivars. However, no significant ($p > 0.05$) interaction was observed in the 'chlorophyll a', 'chlorophyll b', 'RWC', 'plant height', 'LAI', 'plant dry weight', 'number of branches per plant', 'yield' and 'fruit length'.

The highest yield obtained in 'Thirunelvely Purple' brinjal cultivar under salt stress condition would have been due to its inherent characteristic feature. Hence, considering the measured physiological and growth attributes, 'Thirunelvely Purple' cultivar can resist salt better than the rest of the cultivars and could be suggested for cultivation in the salt prone soils of the Batticaloa district.

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