

Effect of soil moisture stress on the Indole-3-Acetic acid (IAA) Oxidase Activity of three selected chilli (*Capsicum annuum* L.) cultivars during the flowering stage and its impact on fruit yield

S.Mahendran* and N.Sujirtha

Department of Agricultural Biology, Faculty of Agriculture, Eastern University, Chenkalady, Estern Province, Sri Lanka

IAA oxidase is the enzyme to oxidize IAA to Methylene Oxindole which is an inactive form of auxin. During abiotic stress, auxin content decreases in plant system because of high IAA oxidase activity. The present study was conducted with the objectives of estimating IAA enzyme activity in selected chilli cvs. viz., MI 2, KA 2 and 'Arunalu' in response to moisture stress and to determine the extent of stress tolerance in these cvs. based on this enzyme activity. All the chilli cvs. were grown in polyethylene bags filled with sandy regosols. Two levels of moisture (stress and control) were used. Moisture stress was imposed by withholding water at once from the initiation of flowering up to 15 days during the flowering stage. Control plants were watered to Field Capacity at 5 days interval. Gypsum blocks were used to assess the moisture levels of plants. Moisture stress significantly increased the IAA oxidase activity of the three chilli cvs. The highest IAA oxidase activity (lowest un-oxidized auxin) was found in 'MI 2' where as the lowest IAA oxidase activity (highest un-oxidized auxin) was found in 'Arunalu'. 'KA 2' showed significantly higher IAA oxidase activity than 'Arunalu'. The IAA oxidase system is proved to influence plant growth by regulating the concentration of endogenous IAA. Plant tissues capable of rapid growth have been found to exhibit low IAA oxidase activity. From the above results, it could be stated that 'Arunalu' was able to maintain growth and development better than 'KA 2' and MI 2' chilli cvs. despite a severe stress situation. As such, 'Arunalu' exhibited better stress tolerance than 'KA 2' and MI 2'. Moisture stress significantly reduced the fruit yield of all the chilli cvs. The highest yield was obtained in 'Arunalu' and the lowest one was found in 'MI 2' under moisture stress condition. The stress tolerance feature of 'Arunalu' characterized by high accumulation of auxin; other words, low IAA oxidase activity would have influenced plant growth by regulating the concentration of endogenous IAA. Thus, 'Arunalu' was able to thrive and produce well under water deficit situation.

Keywords: IAA Oxidase, Soil moisture stress, Stress tolerance, Yield

*thevamahen@yahoo.com