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RESEARCH ARTICLE

Influence of high temperature on α-amylase and antixoxident enzymes in wheat (*Triticum aestivum* L.) varieties

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SUMMARY

The study was conducted for two winter seasons during 2006-07 and 2007-08 at Student Instructional Farm of Narendra Deva University of Agriculture and Technology, Narendra Nagar (Kumarganj), Faizabad using 15 wheat (*Triticum aestivum* L.) varieties (Halna, Raj 3765, NW 1014, PBW 343, HD 2643, HP 1744, NW 2036, DBW 14, NW 1076, Sonalika, HD 2285, HD 2307, K 8962, UP 2425, and HP 1633) and three sowing dates 10th December (NS), 25th December (LS_1) and 10th January (LS_2) to assess the relative efficiency of different selection parameters. There was significant increase in the activity of superoxide dismutase (SOD), peroxidase and calatase in the late and very late planting at all stages, however, α-amylase content activity decreased under late and very late planting compared to normal planting.

Key Words : SOD, Peroxidase, Calatase and α-amylase, Wheat

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Heat stress indices significant changes in normal physiological processes, such as photosynthesis dark respiration and mitrochondrial respiration (Ngliyen and Joshi, 1993). One mechanism of injury involves the generation and reaction of reactive oxygen species (ROS) (Liu and Huang, 2000). Plant protect cell and sub-cellular system from the cytotoxic effect of the active oxygen radicles using antioxidant enzymes, such as superoxide dismutase, catalase, paroxidase and α-amylase and metabolite like Glutathion, ascarbic acid, α-tocopherol and carotenoid (Sairam *et al.*, 2000). Under heat stress levels of catalase have been shown to drop in a wide range of species. Activity of SOD also drop in creeping bent gross after two weeks of exposure to 35^{0}C. The present work was conducted to study the effect of high temperature stress on antioxidant enzyme and the role played by the antioxidant enzymes in protecting the plant cell from damage occurring the two high temperature stresses.

MEMBERS OF THE RESEARCH FORUM

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MATERIALS AND METHODS

The experiment was conducted in the field condition with 15 wheat varieties *viz*., Halna, Raj 3765, NW 1014, PBW 242, HD 2643, HP 1744, NW 2036, PBW 14, NW 1076, Sonalika, HD 2285, HD 2307, K 8962, UP 2425 and HP 1633. Seed were obtained from Department of Genetics and Plant Breeding, field were prepared before sowing mixing sandy loam sowing by Kudali. Planting were done on 10th December (NS), 25th December (LS_1) and 10th January (LS_2) in order to expose the plants to different temperature regime. Normal recommended agronomic practices were performed the temperature under three sowing at three stages were recorded by a field meteorological laboratory fitted microprocessor control data logger, which recorded daily maximum, minimum temperature, sunlight duration, RH, rainfall, wind velocity etc. All enzymatic content like α-amylase (Chance and Maehly, 1955) calatase (Sinha, 1972), peroxidase (Curne and Galston, 1959) and SOD (Asada *et al.*, 1974) were estimated on first fully expended leaf (third from top) at vegetative stage (30, 60 and 90 DAS).