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An *In vitro* approach for heat tolerance screening of promising potato cultivars

Potato (*Solanum tuberosum* L.) is world's single most important tuber crop which grows in about 150 countries and plays a vital role in global food system. The tubers being highly nutritious with high concentration of energy, high quality proteins, minerals and vitamins are comparable to any other quality products of plant origin like cereals. It is an economically important staple crop for both developed and developing countries. In India, potato is popularly known as 'The king of vegetables' and has emerged as fourth most important food crop after rice, wheat and maize. In world scenario, India stands the second largest producer of potato. India produced 42.34 million t from 1.86 million ha with an average yield of 22.72 t/ha of Potato during 2010-1. Though potato productivity in India (22 tons/ha) is better than world average (16.6 tons/ha) still it stands far lower than that of European countries (e.g. Netherlands=42.4 tons/ha). India is estimated to have a population exceeding 1.3 billion by 2020 and this will require the country to produce about 49-50 million tons of potato. Because of global warming, the global mean air surface temperatures have increased by approximately 0.7°C in the past century, with a projected further rise of 1.1 - 6.4°C by the end of 21st century. Using simulation model-based predictions of global warming over the next 60 years, predicted potato yield losses are predicted to be in the range of 18 to 32%. However, these losses can be reduced to 9-18% with adaptations to production methods, such as terms of planting time and use of Heat-Tolerant (HT) cultivars. Searching for genotypes resistant to heat within crop species has become increasingly important in view of global warming.

Recent Publications

01. Pawan KJ, Kumar VA, Shah S and Kumar A (2009) Photoautotrophic Micropropagation For Cost Effective And Successful Clonal Multiplication Of Fruit Crops. In : Proceedings of 1st International Symposium on Biotechnology of Fruit Species, M.V. Hanke Eds., *Acta Hort.*, Vol. 839, pp. 93-98.
02. Kumar V A and Kumar A (2007) Slow growth in vitro storage of plum shoot cultures. *Indian Journal of Horticulture*, 64(1):79-80.
03. Joshi K, Pant NC, Kumar VA and Kumar A (2016) Antioxidant and antimicrobial activities in flowers of *Gentiana kurroo* Royle, a critically endangered plant from Garhwal region of Uttarakhand, India, Medicinal plant: *International journal of phytochemicals and related industries*, 8 (2), 151-157. doi : 10.5958/0975-6892.2016.00008.
04. Kandpal G, Nautiyal MK and Kumar A (2017) Role of silicon solubilizer for water stress tolerance in different genotypes of rice (*Oryza sativa* L.). *Green Farming*, 8 (4):840-844.
05. Semere T and Kumar A (2016) Laser capture microdissection and its applications in plants. *Journal of Hill Agriculture*, 7(2): 173-177.

Biography

Dr. Atul Kumar is presently working as Professor (Plant Physiology) at College of Basic Sciences and Humanities of GB Pant University of Agriculture and Technology, Pantnagar, India. After obtaining his Masters in Plant Physiology (1977) and Ph.D. in Horticulture (1983), Dr. Kumar is engaged in Teaching and Research in various aspects of Plant Sciences for over 30 years. He has expertise in the area of Plant Tissue Culture of important Fruits, Vegetables, Ornamentals, and Medicinal and Aromatic Plants. Physiology of Abiotic stress in plants is another area of his interest. He has visited several countries in connection with participation in conferences, symposia for presentation of his research work and also received Advanced International Training on Plant Biotechnology at Hebrew University of Jerusalem, Israel. He has authored three Text-cum-Reference Books on Plant Tissue Culture and has over 80 publications of different categories to his credit.

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