

Supplementation of potassium improves antioxidant potential of plants

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Sufficient quantity of essential mineral elements is important to exploit the genetic potential of crop plants. Among the macro elements, potassium (K) holds third position for plant growth and application of potassium has a bearing on nitrogen metabolism and overall growth. The experiments conducted in our laboratories on *Avena sativa* and *Trigonella foenum-graecum* suggest that addition of potassium apart from contributing towards nitrogen metabolism and overall growth also brings about alterations in the antioxidant system which may be beneficial from food/pharmacognostic/medicinal view point. Plant cells have defense molecules which work to maintain the delicate balance between reactive oxygen species (ROS) production and detoxification. ROS scavenging can be achieved through enzymatic antioxidants which include superoxide dismutase (SOD), catalase (CAT), peroxidases (PODs), etc. whereas, the non-enzymatic components include polyphenols, carotenoids, ascorbic acid and tocopherols. Plants reportedly provide important health promoting bioactive compounds reducing the risk of diseases which may be attributed to oxidative stress generated by ROS. Bioactive compounds can behave as chelators for nutrient tolerance in maintaining mineral homeostasis in order to maintain optimum mobilization and translocation into and within the plants for ensuring the efficient storage of mineral elements in fruits and seeds. The presentation addresses these issues in the context of food crops with special reference to oat (*Avena sativa*) and fenugreek (*Trigonella foenum-graecum*).

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Silkworm pupae: A unique functional food with antioxidant and antihyperlipidemic activity

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The pupae of *Antheraea assamensis* (AA), an indigenous silkworm species of north eastern (NE) region of India, have been widely used as a delicacy by some ethnic people of this region from time immemorial. Based on traditional knowledge, the present study has been initiated to investigate the nutrient composition, antioxidant and antihyperlipidemic activity of the pupae extract of AA (PEAA). Nutrient composition revealed a good source of protein (54.2 g %), fat (16.6 g %) and crude fibre (3.05 g %). The antioxidant activity was measured by 1, 1-diphenyl-2-picrylhydrazyl (DPPH) and thiobarbituric acid reactive substances (TBARS). *In vivo* study was conducted by administering oral doses (0.25 g/kg, 0.5 g/kg and 1 g/kg b.w) of PEAA for 28 days in cholesterol fed rat. *In vitro* study of PEAA showed good DPPH free radical scavenging activity and inhibition of lipid peroxidation with IC₅₀ value of 20.34 µg/mL and 45.2 µg/mL respectively. Administration of 3 doses of PEAA showed significant reduction in serum lipid profiles i.e., total cholesterol (TC), triglycerides (TG) and low density lipoprotein (LDLc) and percent inhibition of liver TBARS level by 30.86%, 35.38% and 39.63% respectively as compared to that of cholesterol fed group. Histopathological observations showed loss of normal liver architecture in cholesterol fed rats which were retained in treated groups. The findings of this study suggested that silkworm pupae may be a potential functional food which could be used both as a prophylactic and therapeutic agent.

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