

***Silybum marianum* extract reduced acrylamide-induced neurotoxicity in both in vitro and in vivo assessments**

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Abstract

Introduction: Acrylamide (ACR) is a water-soluble monomer that is used in different industries and has been found in carbohydrate rich food cooked at high temperatures. ACR monomer is a potent neurotoxic agent and damages the central and the peripheral nervous system in human and animals. One of the principle mechanisms related to the neurotoxicity of ACR exposure is oxidative stress. *Silybum marianum* (L.) is a member of the Asteraceae family, which contains large numbers of chemical constituents including several flavonolignans collectively known as silymarin, has powerful antioxidant properties. In this study, the neuroprotective effect of *Silybum marianum* extract was evaluated using wistar rats and PC12 cells.

Methods: Male Wistar rats were treated with ACR (50 mg/kg, ip) alone or with *Silybum marianum* extract (200, 400 and 600 mg/kg ip) for 11 days. Then behavior index (gait score) was examined for rats. For in vitro study, PC12 cells were treated with different concentrations of chrysin (2.5-100 µg/mL) for 12 and 24 h, and then were exposed to ACR. After 24 h, cell viability was determined using MTT assay.

Results: Exposure to ACR led to cause a relatively rapid increase in gait score and treatment with 600 mg/kg of *Silybum marianum* extract significantly reduced abnormalities ($p < 0.05$). Treatment with *Silybum marianum* extract could reduce ACR-induced cytotoxicity in PC12 cells in the dose-dependent manner.

Conclusion: Our results show that *Silybum marianum* extract has neuroprotective effects against acrylamide induced neurotoxicity in both in vitro and in vivo assays.

Key words: *Silybum marianum*, antioxidant, neuroprotective, neurotoxicity