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Antidiabetic activity of *Pyracantha coccinea* extract in alloxan-induced diabetic rats

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Medicinal plants have been a source of a wide variety of biologically active compounds for many centuries. These plants have been used extensively, as crude material or after the extraction of their key active compounds, for treating various disease conditions. The present investigation was carried out to evaluate the antidiabetic effect of the Greek medicinal plant *Pyracantha coccinea* in alloxan induced diabetic rats. Blood glucose levels and body weights of control and diabetic rats were monitored. In the present study, activities of liver enzymes (glucokinase, glucose-6-phosphatase and fructose-1-6-diphosphatase) were also determined. Glucophage, an antidiabetic oral drug was used as reference. Oral administration of methanolic extract (200 mg/kg body weight) for 30 days resulted in a significant decline in blood glucose from 340.20 to 145.0 mg/dl and significant recovery in body weight of diabetic rats. There was also a significant reduction in the activities of glucose-6-phosphatase and fructose-1-6-disphosphatase in liver. The study clearly shows that the methanolic extract of *Pyracantha coccinea* possesses potent antidiabetic activity.

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Modification of lens crystallins by peroxy nitrite, reducing sugars and ascorbic acid: The potential implications of the basic pathomechanism underlying cataract development during ageing, eye inflammation and hyperglycemia

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The eye lens is composed of highly stable and long-lived proteins (α , β and γ -crystallins) which perform both structural and refractive functions. Due to their limited turnover during the life span, these proteins accumulate various modifications in their structures which finally attenuate their ability in the maintenance of lens transparency. In the current study, lens crystallins were chemically modified with peroxy nitrite, different types of reducing sugar and ascorbic acid, as all of these chemical agents have been already indicated to contribute in the pathogenesis of cataract development. The different spectroscopic techniques and gel mobility shift assay were applied to investigate the structural feature, stability, aggregation/oligomerization and chaperone-like activity of lens proteins after these modifications. The concentration of peroxy nitrite in the lenticular tissue can be significantly elevated during inflammation and in diabetic patients. Also, chronic hyperglycemia in eye lens results in formation of advanced glycation end products (AGEs) on lens crystallins and oxidative stress. Additionally, the copper-catalyzed oxidation of ascorbic acid to dehydroascorbate which is known as a strong modifier of lens crystallins plays a central role in pathology of cataract diseases during aging and in patients with diabetes mellitus. In the current work, as the structural and functional impacts of these modifications were evaluated on the lens crystallins, their pathomechanisms as the causative players in development of cataract diseases during ageing, inflammation and hyperglycemia are discussed.

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