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Natural antioxidants in liver therapy

Anna Blázovics, Agnes Kéry, Erzsébel Fehér, Läszlö Prónai, Rhenso González-Cabello, Irén Barta, Andrea Lugasi, Péter Gergely, János Fehér

Sempervivum species have been well known plants in folk medicine for centuries. Although the crude drug *Sempervivum tectorum L.* (stonecrop) (*Crassulaceae*) has been used for treatment of inflammation, its antioxidant and scavenger properties have not been studied previously. Phytochemical screening of the plant extract proved the presence of flavonoids, polyphenolic compounds and polysaccharides. The aim of our study was to verify that the natural antioxidant molecules of *Sempervivum tectorum* extract protect the membrane structures and function, diminish the lipid peroxidation in different ways, influence the immune reactivity and support the natural scavenger capacity of tissues in various experimental models in which free radical reactions are involved. The superoxide and ·OH scavenging activity of lyophilized extract of *Sempervivum tectorum* was determined by electron paramagnetic resonance spin trapping method and by chemiluminescence technique. The extract inhibited the non-enzymatic induced lipid peroxidation in the liver microsomal fraction of rats *in vitro*. Liver protecting, lipid – lowering and HDL-cholesterol-enhancing activities of *Sempervivum tectorum* extract were studied in experimental hyperlipidemia and secondary steatotic liver of rats. On the basis of histopathological investigations, diffuse hepatocellular degeneration caused by a fat rich diet was improved after treatment with this extract. The measured serum parameters were changed favorable after *Sempervivum tectorum* extract treatment. Beneficial effects of extract were also observed in the concanavalin-A stimulated blast transformation of splenocytes, on the lipopolysaccharide triggered tumor necrosis factor-alpha activity, and on the spontaneous interleukin-1 activity of spleen macrophages of hyperlipidemic rats. The natural scavenger capacity was increased by the treatment, initiating restoration of liver function. This drug provides protection of small intestine as well.