

NEW RESEARCH ON SAPONINS SHOWS THEIR WIDE RANGE OF PHARMACOLOGICAL ACTIVITIES

Summary

Saponins (saponosides) belong to a group of secondary metabolites, widely distributed mainly, but not exclusively, among plants. They are reported to occur in over 500 species from over 90 families of both edible and nonedible plants. Chemically, saponins are glycosides consisting of a sugar moiety and non-sugar aglycone, called also sapogenin. Depending on the number of sugar chains attached to the aglycone, mono-, bi- and tridesmosides are distinguished. According to the structure of aglycone, saponins are classified into steroidal and triterpenoid. Common for all types of saponins are their surface-active properties and the ability to form a stable foam in water solutions. This property makes saponins applicable as components of household detergents and fire extinguishers. Saponins have a high ability to bind to cell membrane sterols, which is responsible at least in part for their biological activities. They reveal also strong haemolytic properties, which differ depending on the saponin type and its aglycone structure.

Saponins exhibit a wide range of biological properties and are believed to be one of the key biologically active constituents of plant drugs used in folk, especially Far East medicine. Many of the most important saponins are present in the roots of ginseng (*Panax ginseng*), soybeans (*Glycine max*) and plants of *Bupleurum* genus. Saponins are also widely used in conventional medicine (i.e. expectorants, hypocholesterolemic drugs). Moreover many studies *in vitro* and *in vivo* exhibited their anti-inflammatory, antimutagenic, antiviral, antibacterial, antifungal, analgesic, and antitumour activities. The latter is the most promising because of its possible future therapeutical application, since many cancer cell lines are more vulnerable to saponins than normal cells. Its cytotoxicity in most cases is the result of apoptosis, nevertheless additional studies including determination of the inhibitory mechanisms of saponins should be addressed.