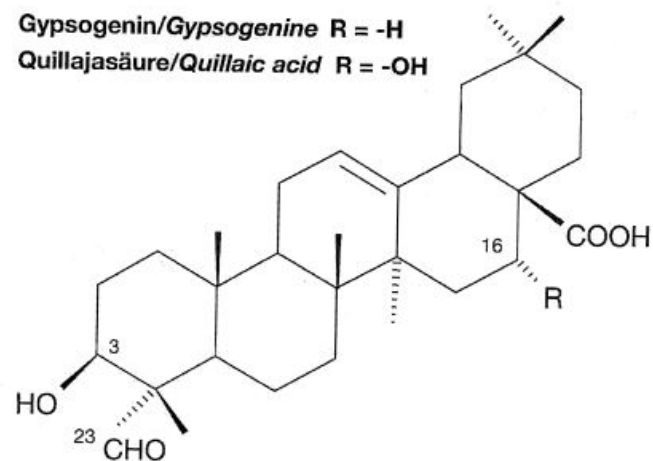


## Gypsophila Saponins

Gypsophila saponins are  $\Delta^{12}$ -oleane-type root saponins. They are extracted from soaproots of various origins or from their mixtures.

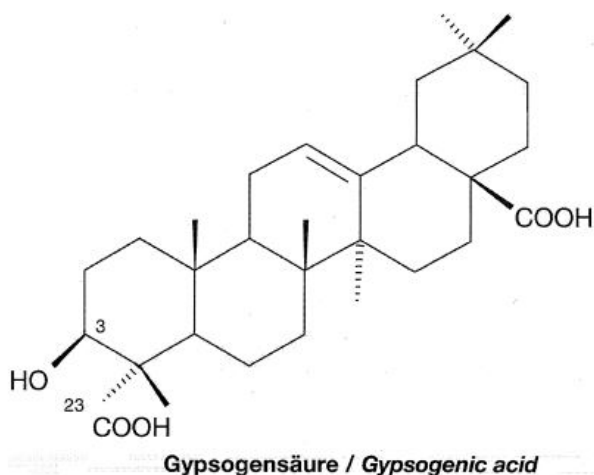
The trivial names of common soaproot drugs are based on their country of origins. These drugs may contain mixtures of several species:

1. Iranian soaproot (*Acanthophyllum squarrosum* Boiss. and *A. pungens* from the carnation family (Caryophyllaceae)). The most important saponin-containing genera of this large plant family are Saponariae and Gypsophilae.
2. Levantine soaproot (also known as Egyptian, Russian, Hungarian or white Soaproots). A mixture of *Gypsophila paniculata* L., *G. effuse* and *G. acutifolia* Fisch. In addition, the drug probably contains small amounts of roots of *G. fastigiata* L., *G. elegans* Bieb. and *G. altissima* L. (K.-G. Kannenberg, 1965).



The true aglycon or the main aglycon of these soaproots is gypsogenin, chemical formula  $C_{30}H_{46}O_4$ , which does not contain a hydroxyl group on C-16, in contrast to quillaic (R. Tschesche, 1973).

In addition, the roots of *Gypsophila* species also contain saponins in which the aglycon is quillaic acid (D. Frechet, 1991 and K. Hostettmann, 1995) or gypsogenic acid (K.-G. Kannenberg, 1965).



Saponins from soaproot are almost always more intensively coloured than quillaja saponins and some are even brownish. Only incomplete standardisation is possible because the roots are usually not sorted and are delivered as mixtures. The foam index of soaproot saponins is usually somewhat higher than that of quillaja saponins.

Otherwise, saponins from soaproots are, in principle, very similar to quillaja saponin. Thus, it is reported in the literature that gypsophila saponin also exhibits a critical micelle concentration (cmc). Spherical aggregates of approximately 10 molecules are formed above this concentration. Similar to quillaja saponin, gypsophila saponin also forms large mixed micelles with bile acids (D. Oakenfull, 1989).

Furthermore, gypsophila saponin is an active adjuvant, similar to quillaja saponin; however, it does not form any discrete ISCOMs, but rather annular aggregates, so-called "pore complexes" (R. Bomford, 1992).

In earlier times, gypsophila saponins were used extensively in folk medicine. They are still used in the production of film materials and light-sensitive papers, and as foaming and adhesive agents in fire-extinguishing foams.

Gypsophila saponin provides the standard saponin cited in pharmacopoeias for the determination of the haemolytic index (E. Steinegger, 1988), because only traces, if any, are bound by the plasma dialysate. (G. Vogel, 1962).

#### **Industrial application fields of saponins:**

- For pharmaceutical purposes, e. g. vaccines and adjuvants (ISCOMs)
- Laboratory chemical to measure particular blood values