

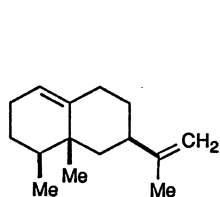
Quantitative determination of the saponin content in different parts of *P. ginseng* showed that the contents were in the following order: flower bud > fruit > stem > leaf > root > seed. Leaves appeared to be a good source for the extraction of ginseng saponins. After defatting with petroleum, leaves are extracted with 90% ethanol. The supernatant of the ethanolic extract is dried under reduced pressure to give the saponin fraction [42].

The processing methods of ginseng root also influence the saponin content. Quantitative determination of the total ginsenoside content in processed ginseng root showed that the total ginsenoside contents were the highest in freeze-dried ginseng roots, followed by roots dried in the sun and steamed roots, and were the highest in the fibrous root, followed by the lateral root and the main root with a total ginsenoside content of 9.7%, 6.4%, and 3.3%, respectively [43]. The saponin and ginsenoside contents were higher in wild than in cultivated ginseng [44, 45].

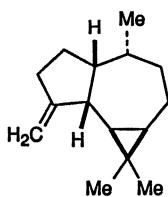
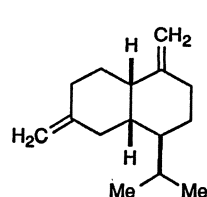
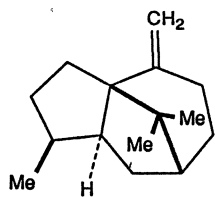
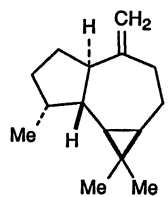
The quantitative determination of ginsenoside could be carried out by HPLC [46–48] TLC [49, 50], or colorimetric method [51–53]. Colorimetric determinations after hydrolysis and reaction with vanillin-sulphuric acid or with vanillin-perchloric acid in acetic acid enable a rapid comparison of different ginseng products to be made but they are not specific because only the total amount of the formed panaxadiol and panaxatriol can be determined. TLC or HPLC methods are more specific and can be used to determine the individual ginsenoside [54, 55].

The saponin content of some commercial ginseng preparations was also reported, e.g., Renshenlu, steam distillate of ginseng, contained 58 mg ginsenosides/l [50]; Renshenjin, aqueous solution of ginseng, contained 0.2%–0.3% total saponin [57]; Renshengao, ginseng extract, contained 3.89% total saponin [58], and ginseng tea showed a total ginsenoside content of 1.1% [59].

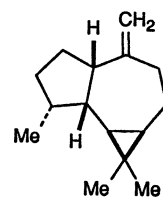
Furthermore, ginseng root contained a number of chemical constituents other than saponins. The volatile component of ginseng root contained a series of sesquiterpenes such as eremophilene (91-17), β -gurjunene (91-18), *trans*- and *cis*-caryophyllene, ϵ -muurolene (91-19), γ -patchoulene (91-20), β -eudesmol, β -farnesene, β -bisabolene, aromadendrene (91-21), alloaromadendrene (91-22), β -guaiene (91-23), γ -elemene, mayurone (91-24), pentadecane, 2,5-dimethyltridecane, and palmitic acid [60].



Eremophilene (91-17)

 β -Gurjunene (91-18) ϵ -Muurolene (91-19) γ -Patchoulene (91-20)

Aromadendrene (91-21)



Alloaromadendrene (91-22)