LICORICE

Terminology

Licorice, or glycyrrhiza, is the dried root of the leguminous plant Glycyrrhiza glabra L.[1] The principal flavor constituent of licorice is glycyrrhizic acid, or its mineral salt, glycyrrhizin.

Sources

Licorice is native to southern Europe and Asia. The glycyrrhizin content of the licorice root usually varies from 6-10%. Spanish and Italian roots contain the lower amounts of glycyrrhizin while the Oriental root tends to contain higher amounts.[2] Other components of licorice root include starch, sugars, flavonoids, triterpene, and the B vitamins.[3]

Licorice is marketed as a powdered Oriental extract containing 25% glycyrrhizin, as a paste containing 8% glycyrrhizin, and as a powdered form of the paste containing 6-10% glycyrrhizin.

Usage

Licorice which is 50X sweeter than sucrose is used as a sweetening and frothing agent[4] in confectionary products, medicines, and tobacco.

Licorice has been known for over 4,000 years as evidenced by the licorice root found in King Tut's tomb. Spanish sailors are credited with being the first to use licorice on tobacco, as a preservative. In 1830, this sweetening agent was introduced in a commercial chewing tobacco. Licorice has also been used since the 1800's in pipe and cigarette tobaccos, as well as snuff.[5]

Current usage levels of licorice in chewing tobacco products range from 3-6% and in cigarette tobacco from 0.25-0.40%.

Toxicology

Licorice powder containing 48-58% glycyrrhizin gave LD_{50} data of 4.0-4.4, 1.42-1.70, and 14.2-18.0 g/kg in rats and mice after subcutaneous, intraperitoneal, and oral administration, respectively. Rats given 2.5g powder/kg/day orally for 3 months showed decreased body weight gain, blood cell count, and thymus weight. All pre-testing physical conditions were restored following discontinuation of the oral administration. Oral administration of 0.31-0.63 g powder/kg for 90 days resulted in no toxic affect.[6]

The lowest dose to be orally administered to humans and produce a toxic effect (TDLo) was 280 mg/kg. The duration of exposure was 4 weeks, and the exhibited toxic effect was gastrointestinal distress.[7]

Pyrolysis Products

The only study of the pyrolysis in cigarettes of glycyrrhizin noted decomposition of glycyrrhetic acid and transfer of this material to the cigarette mainstream.[11] However, this reaction accounted for only a small portion of the added glycyrrhizin and the rest was unaccounted.

Regulatory Status

Licorice extract, licorice extract powder, and licorice root were generally recognized as safe as published by FEMA in 1960 in GRAS(I).[8] In 1965, in GRAS(III) average maximum usage levels of licorice were cited. In chewing gum, the average maximum usage level of licorice extract was 29,000ppm, of licorice extract powder 22,000 ppm, and of licorice root 3,200 ppm.[9]

In 1977, the Federal Registry cited average maximum usage levels of licorice extract in hard candy as 37.0%.[10]

Licorice powder and extracts have been placed on the Hunter List as accepted cigarette additives in Britain.[12]

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