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REVIEW ARTICLE

Multifaceticious Uses of Soapnut Tree – A Mini Review

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ABSTRACT

Sapindustrifoliatus is one of the oldest cultivated medicinal plants in the world. Infact Botanist traced it to the period of the Vedas about 5000 years ago. It is a small tree flourish well in the loamy soils of tropical and sub-tropical regions. It has a number of health benefits besides the famous benefit of keeping the hair long and healthy and also useful in the treatment of lice's and dandruff. It is an excellent herb for skin problems like eczema and psoriasis. Soapnut powder is a very good antibacterial and antifungal agent. It is mostly used in the cosmetic and contraceptive creams. It is also used as detergent, bio-surfactant and remedial for organic soil pollution in the modern science. The multifaceticioususes of this plant are discussed in this paper.

Key words: Soap nut, *Sapindustrifoliatus*, chemical content, medicinal uses

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INTRODUCTION

Sapindustrifoliatus Linn., a small deciduous tree belongs to the family Sapindaceae which is known as soapnut in English, Ritha in Bengali and Ponnangottai in Tamil [1]. It is a native species grown in Indo-Gangetic plains, Shivaliks and Sub-Himalayan tracts in India at altitudes ranging from 200m to 1500m [2]. It is one of the most important trees of tropical and subtropical regions of Asia. It is commonly found in the Western Ghats and plains of South India [3]. This tree flourishes well in deep clay loamy soil with an annual rainfall of 200 mm. It is a medium sized tree that reaches a height of 25m. The flowers are small greenish white in colour and the fruits are solitary globose and appear in the month of July- August. The fruit contains an active principle saponin which ranges from 6-10 % of mass weight [4]. Saponin from soapnut is also widely used in the native medicine [5], Pharmaceutical industries [6, 7], used as detergents [8] and used for environmental remediation [9].

Chemical Composition

All parts of the *Sapindustrifoliatus* contain phenolic acids such as proto catechuic acid, cis -p-coumaric acid, p-hydrobenzoic acid and cinnamic acid [10].

The major constituents of the fruits are saponins (10%-11.5%), sugars (10%) and mucilage. The saponin can be extracted by simple chemical extraction method [11]. The seeds contain fatty acid. The fatty acids are arachidic, behenic, linoleic, oleic, palmitic, stearic, oleanolic acid, and sapindic acid. The seeds contain trifolioside A, sapindiside C, D, E, glucopyranosides of stigmasterol, kaempferol, quercetin, B-sitosterol, hederagenin, protein, carbohydrate and starch [12]. The pericarp of the fruit contains sgenins, methylhedragenate and methyl oleanolate [13].

Medicinal Use

Soapnut is a natural exfoliant. The plant is very commonly used in Indian Ayurvedic healing system. It is also used in Unani and Tibetan indigenous medicine. For Asthma and cough, it is given as an expectorant. It is an effective ingredient in Ayurvedic shampoos and cleansers. Soap nuts are used for eczema and psoriasis. It is having anti-bacterial, anti-fungal, insecticidal properties. The powdered seeds are used for the treatment of arthritis, common cold, constipation, nausea and dental caries [14]. The poultice of soapnut is prepared and it is applied on the affected portions of joints for the relief from joint pains [15].

Soapnut cold water extract is hyper allergenic and very effective in neurodermatitis and inhibits platelet aggregation. The alcoholic extract of soapnut is reported to possess anti-implantation activity [16]. It also possesses anti-cancerous property against breast cancer cell lines [17].

Saponin obtained from the fruits of Soapnut have shown spermicidal activity [18, 19]. The natural saponins are more effective than chemical alternatives [20]. Because of this

natural principle of saponin, it is used in the industrial preparation of contraceptive creams [21].

Folk Medicine

Soapnutwater extract is used as a mucolytic agent [22].The roots and stem bark are considered as a mild expectorant and demulcent [23]. It is used for treatment of excessive salivation, epilepsy, lice and for removing freckles [24]. The saponin obtained from the berries reduces the cholesterol level in diabetic patients.

Soap nuts which are the part and parcel in daily life of Indians from several centuries and now-a-days it is used to synthesize silver nanoparticles. The silver nanoparticles have more inhibitory activity on the growth of pathogenic gram positive bacteria than gram negative bacteria [25]. Modern scientific and medical researchers have shown the use of soap nuts in the treatment of migraines [26, 27].Soapnut water extracts possess multiple bioactivities and it is used in medicals, cosmetology, food supplementation, antibiotics and chemotherapy [28].

Other Uses

The plant glycosides have been used for washing by native peoples in Asia as well as native Americans [29]. In Nepal, soapnut berries soaked in water is used for washing the finest silks and woolens. Soapnuts are being considered for commercial use in cosmetics and many other cleaning agents [30] which will not cause any toxic effects on human skin and eyes. It is also used as shampoo to remove dandruff, to reduce hair loss, skin cleaner and stains remover [31].

Sapindus leaves are used as a pesticide in the storage of food grains for preventing lepidoptera moths and flies. It is also used as a mosquito repellent in houses. The soapnut shell has a great potential as a natural surfactant for washing the soils polluted with organic compounds and crude oil. The soapnut berries soaked in water and the extract is used in cleaning teeth, polishing jewellery, cleaning glass, paintwork and even washing the car. The jewelers in India use this plant extract to bring back the lost brightness of ornaments made of precious metals like gold, silver, etc [32,33].

The kernel contains 25- 30 % of fatty acid, approximately 85% of triglycerides and sterol. The oil extracted from the kernel is used as a bio-fuel [34]. It can be directly blend with the fossil fuel at the maximum of 20%. The seed oil can also be converted into biodiesel by transesterification method. The fatty acid of this soapnut seeds has a great potential source for inhibiting the bio-corrosion of mild steel and copper alloys. Studies are on progress to evaluate the soapnut oil as a potential source for biodiesel and bio inhibitor in our centre. The oil cake obtained after the extraction of oil can be used as a bio manure, bioherbicide, biofungicide and biopesticide. The saponin from Soapnut acts as a natural bio-surfactant [35].The fruit is used as fish poison [36].



CONCLUSION

*Sapindustrifoliatu*s is a small tree commonly available in tropical and temperate regions especially in foothills of Western Ghats and Eastern Ghats. The various parts of this plant like root, the leaves, stem bark, wood and fruit are highly useful to the human beings. The fruit is mainly used for the preparation of hair tonics, cosmetics, skin creams and mainly used for anti spermatic activity. The product obtained from the plant is natural and eco-friendly. So it is very apt to call as multifacetious useful tree.

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