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# TRADITIONAL SOAP AND DETERGENTS YIELDING PLANTS AND ANIMAL MATERIALS OF HIMACHAL HIMALAYA

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**Abstract:** Traditional use of organic materials as soaps and detergents indicates the wisdom of people about utilization of biodiversity in their surroundings. Himachal Himalaya represents a wide range of agro-ecological conditions where altitude varies from 900m to over 3000 m. The three districts included in the study represent almost all conditions. A total of 23 plant species and two animal byproducts had been used by the people as soaps and detergents. The processing techniques and chemical basis of some 17 materials have been mentioned. These materials may find way to develop skin- and environment- friendly natural products in future.

## INTRODUCTION

The plants and animals have been source of several human requirements in the traditional rural living in the difficult mountain tracts of Himalayas. Hence it is observed that the traditional uses of plants and plant products, and also animals and animal by-products were intimately associated with human survival on earth. Probably poor access to supply markets and low availability of cash money for transaction for the people with sustainable farming and habitations in difficult mountain rural areas, had necessitated search of a large number of edible plants consumed as vegetable, fresh or dried fruits and bulk providing root tubers such as Yams. Similarly they have heavily depended on herbal medicines and their products for the maintenance of health and cure of various ailments. Likewise plants and plant products or animal byproducts used as soaps and detergents for washing clothes, for body cleanliness were also discovered in different regions. The Himachal Himalaya comprises of (i) plain valleys with hot tropical/subtropical climate; (ii) Sub-mountainous tracts with subtropical climatic conditions; (iii) Mid mountainous region; (iv) Temperate and wet high mountains; and (v) Temperate semi-arid high mountain areas. The occurrence of these plants thus, varies with the above mentioned climatic zones which have different altitude, rainfall/snowfall, temperature

and microclimatic conditions. Indigenous plant species and animal byproducts used as soaps and detergents in different localities of Himachal Himalaya have been documented along with associated traditional knowledge related to their use and the process involved. The plant sources of soaps and detergents are usually rich sources of saponins and alkaline substances and involved no extra cost to the people. Some of these may be worthwhile to investigate further for finding their noble value to make purely organic or non-chemical soaps and detergents friendly to human skin and non-allergic applications.

## METHODOLOGY

A questionnaire was developed and data was collected from primary sources. Data on uses and processing techniques were collected by interviewing randomly selected farmers/respondents from three districts namely Mandi, Bilaspur and Shimla. From each block of these districts, three villages were randomly selected. In each selected village, 5% farmers belonging to 20 years to above 60 years of age group represented by 29-30% female and 68-70% male participants were randomly selected for response. Lottery system was adopted for randomization. A total of 25 development blocks, 75 villages and 250 respondent farmers were sampled. The respondents were inquired thoroughly as per questionnaire schedule and information was recorded and compiled.

**Table-1:** Plant and plant products and animal byproducts traditionally used as soap and detergents by local communities of Himachal Himalaya

S.No.	Species	Local Name	Plant Part Used	Common Use
<b>A. Plants</b>				
1.	<i>Aesculus indica</i> Griff.	Khanor	Seeds	Washing
2.	<i>Agave americana</i> L.	Ramban	Fleshy leaf	Washing
3.	<i>Amaranthus dubous</i> Mart.	Chaulai (Jangali)	Seed husk	Washing
4.	<i>Asparagus adscendens</i> Roxb.	Sahshrapai, Kilty	Fruits & roots	Washing & Bathing
5.	<i>Bauhinia vahlii</i> L.	Taur, Maloo	Bark of tender shoots	Washing
6.	<i>Boehmeria platyphylla</i> D.Don	Handa	Bark	Bathing
7.	<i>Bombax ceiba</i> L.	Simal, Semal	Bark	Bathing
8.	<i>Dioscorea bulbifera</i> L.	Genthi	Bulbils & tuber	Washing & Bathing
9.	<i>Dioscorea deltoidea</i> Wallich ex Griseb.	Shingli-Mingli	Tuber	Bathing
10.	<i>Fagopyrum cymosum</i> (Trev.) Meissn.	Jangli Kuttu	Stem & leaves	Bathing
11.	<i>Grewia optiva</i> J.R. Drum. ex Burrett	Biuhala	Bark of new shoots	Washing
12.	<i>Impatiens balsamina</i> L.	Tiur	Stem	Bathing
13.	<i>Malva sylvestris</i> L.	Sonchal	Root	Washing
14.	<i>Prunus armeniaca</i> L.	Chuli	oil cake	Bathing
15.	<i>Randia dumatorum</i> (Retz.) Poir.	Rada	Fruit	Washing
16.	<i>Sapindus mukorossi</i> Gaertn.	Reetha	Fruit without seed	Bathing and Washing
17.	<i>Silene vulgaris</i> (Moen.)Garcke	Jhun -Jhunu	Root	Washing
<b>Ashes of following plant species</b>				
18.	i. <i>Quercus dilatata</i> Lindl.	Moru	Stems & branches	Washing
	ii. <i>Q. leuchotrichophora</i> A. Camus	Ban	Stems & branches	Washing
	iii. <i>Q. semicarpifolia</i> Sm.	Kharsu	Stems & branches	Washing
	iv. <i>Picea smithiana</i> Wallich	Raee	Stems & branches	Washing
	v. <i>Sesamum indicum</i> L.	Til	Stems	Washing
	vi. <i>Zea mays</i> L.	Chhali	Stems	Washing
<b>B. Animal by-products</b>				
19.	Urine of cattle	Guntra	---	Washing
20.	Whey	Chhachha	---	Bathing and Washing

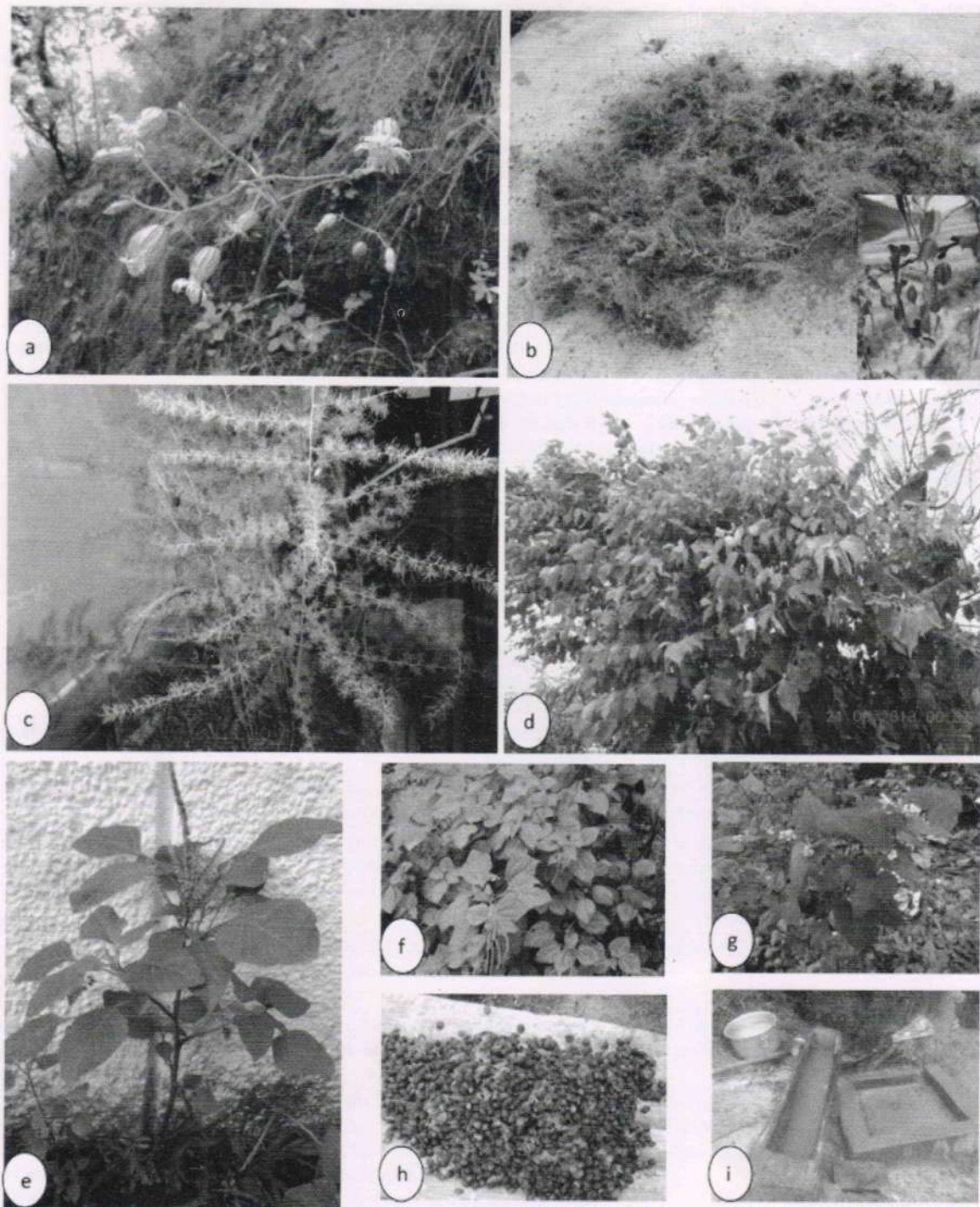
## RESULTS AND DISCUSSION

Table-1 presents the list of plants and animal byproducts and Table-2 presents the active chemical constituents involved in the action as detergent and soap in the process of cleaning or washing or bathing, and the details of processing techniques. All the materials used as soaps or detergents are now known to contain saponin, lactic acid, sodium carbonate, calcium carbonate etc. But without knowing these chemical details, people used them and evolved the necessary processing techniques, which truly were the outcome of their dire necessity of something

that is, soaps and detergents for washing their clothes, bathing of the body, and shampooing of hair. But the way they exploited their soap and detergent property using local materials is the wisdom worth for appreciation. Another important consideration here which requires our attention is that these indigenous ways were not only essential for cleaning and washing, but these in most of the cases involved germicidal or anti-bacterial activity as well. Moreover, some of these were even used as source of medicine. In plants, the most active chemical constituents are saponins which perform the activity of cleaning as soaps and detergents. But there is also practice of using ashes of particular

**Table-2:** Plant species and animal sources with their active phyto-chemicals as well as their respective processing techniques of use of traditional soaps and detergents

Species	Chemical constituent	Local processing technique
<i>Aesculus indica</i>	Saponin (aesculin)	Dehusked seed has a hard seed coat which is removed by beating with a wooden hammer, fleshy part of seed then dried in sun, made into fine powder. The powder is used to wash blankets and other woolen garments, for which the powder is sprinkled all over and soaked in leuke-warm water either overnight or at least 4-6 hours and thereafter briskly worked manually by hand or trampling by foot till all dust and dirt goes out and then washed with water 2-3 times.
<i>Agave americana</i>	Saponin	Tender leaves are crushed with a stone, which are then rubbed on water soaked clothes, briskly shaken, and washed with clean water 1-3 times.
Ashes of following plants; <i>Quercus</i> species and <i>Picea smithiana</i> used at altitudes above 1800 m	Potassium carbonate & sodium carbonate (also called washing soda)	They are burnt in hearth as fuel wood and is collected, stored in a large earthen vessel, which for use for washing is put in big copper cauldrons, half filled with water and cotton clothes are also put in this and water is boiled for 30-40 minutes, then clothes are taken out and washed with water 2-3 times. It is not to be used for woolen clothes.
Ashes of Maize and Sesame stalks used in areas below 1800 m	Same as above	The ash is collected after burning the stem stalks as fuel wood, stored over several days, then for use for washing some quantity is put in a half broken pitcher with a hole at bottom over which hot water is poured and clear water below is collected in a vessel called "chhoa" and is used as detergent for washing.
<i>Amaranthus dubious</i>	Terpinoid saponins	The seed husk is soaked in water and allowed for 5-7 days, thereafter clear water is separated, and is used by the women to wash their hair like shampoo.
<i>Bombax ceiba</i>	Saponins ( $\beta$ -sitosterol)	Crushed bark of tender shoots is rubbed on the wet hairs and skin to act as hair and body shampoo.
<i>Dioscorea bulbifera</i>	Saponins (Diosgenin)	The bulbils and corm are crushed and put in water for washing clothes mainly cotton.
<i>Dioscorea deltoidea</i>	Saponins (Deltonin)	The corm or tuber is dug out, cut into small pieces, dried, made into powder, which is used as hair and body shampoo by mixing in hot water.
<i>Fagopyrum cymosum</i>	Steroidal saponin ( $\beta$ -sitosterol)	Crushed stems and leaves are rubbed on hairs and body to make bath quality lather and act as shampoo.
<i>Grewia optiva</i>	Saponins and steroids	Crushed bark of new shoots and twigs is rubbed on wet hairs and body to act as shampoo.
<i>Randia dumetorum</i>	Ursosaponin	The fruits are collected, crushed and dissolved in cold/hot water to produce foam (lather) and used to soak and then wash clothes with clean water.
<i>Sapindus mukorossi</i>	Terpinoidal saponins	The soap nut bark contains 12-18% saponins and is used as fine powder, which is used for washing all kinds of woolen garments as well as shampooing hairs and body.
<i>Silene vulgaris</i>	Triterpinoid saponins and silenosides	The roots collected after flowering & seed setting is over, chopped in small pieces, dried in the sun and stored in earthen vessel and as and when needed to wash woolen blankets, namadas (shelas) etc which were soaked in wooden cauldrons or tubs called Ruina, filled with hot water in which detergent has been kept layer by layer, stirred for some time with a wooden stick and then washed with clean water. This process provides excellent luster and shine to woolens.
Whey (Chhachha)	Lactic acid	Stored whey over a period of 5-7 days is employed for washing hair.



**Fig.1.** a. *Silene vulgaris* b. Roots of *Dioscorea deltoidea* (inset plant with fruit) c. *Asparagus adscendens*  
 d. *Grewia optiva* e. *Amaranthus dubious* f. *Boehmeria platyphylla* g. *Fagopyrum cymosum*  
 h. *Prunus armeniaca* seeds i. Traditional and modern washing tubs

wood of some plant species viz. *Quercus dilatata*, *Q. leucotrichophora*, *Q. semicarpifolia* and *Picea smithiana* as well as that of cultivated plants, stalks of Maize and Sesame. The wood of these plants species were burnt in hearths as fuel for cooking food for the family members and ash was collected, stored and used for washing of clothes in those days when inorganic chemical soaps and detergents were not easily accessible to common people in the region of N-W Himalaya. In lower belts of sub-mountainous Himalaya, Maize (*Zea mays*) or Sesame (*Sesamum indicum*) stalks were burnt as fuel wood and ash was collected, stored in earthen pitchers or vessels and used as detergent and soap when need arises. Here the ash is put on a sieve made of twigs and straw, and hot water is poured from above, the filtered clear of ash is collected below in a vessel is called "Chhoi" or "Chhoa" i.e. is a herbal liquid detergent and is used for washing clothes (Rawat and Kharwal, 2010). The active chemicals in ashes are generally calcium carbonate (25%-45%) as the major constituent and calcium oxide less than 10% in addition to potash and less than 1% phosphate and trace elements. However, in plants whose ashes are utilized as soap and detergent contain sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) also known as washing soda, which acts as water softener and is used to remove greese, oil and other stains. In fact, calcium carbonate act as water softner, changing the hard water into soft water and thus help in cleaning and washing. Whey (Chhachha) was also commonly used for washing hair and for bathing. The Whey for this purpose was collected and stored in an earthen vessel over a period of 5-7 days and is used to be very sour, thus, containing a high amount of lactic acid, which otherwise is only 0.05 to 0.4%. Lactic acid has the property of behaving as detergent, antibacterial, descaler and soap scum remover.

The Table-1 lists 23 plant species and two animal byproducts which were commonly employed as soaps and detergents in the mountain villages of state of Himachal Pradesh. Amongst these, 17 plant species were used for washing, 4 plant species for shampooing hair and body, and one plant species was widely used for both shampooing

hair and body, and also for washing all types of clothes (cotton and woolen). In animal byproduct, cattle urine was common for bed cushions which when comes in contact with air forms ammonia, acting as a cleaning agent and has got bleaching activity.

The processing techniques, mentioned in Table-2, show the local wisdom as how to exploit soap and detergent properties of various plant and animal origin materials that were available to them at no cost or at very cheap rates. The noteworthy aspect is their intimate knowledge of materials in their surroundings. For instance use of roots of *Silene vulgaris* (Fig.1a), which probably contain very high content of saponins which clearly reveals their deep understanding about this plant without the aid of laboratory analysis for the chemical constituent- saponin. Same is the case with *Fagopyrum cymosum* (Fig.1g), which grows widely in areas above 1500-1600 m. This plant contains saponin as  $\beta$ -sitosterol in stems and leaves. The photographs for some species and traditional and modern tubs are shown in Fig. 1 (i).

The use of plant soaps and detergents or animal byproducts in the modern time, when a large variety of chemical detergents and soaps are available in the market, still have good scope because they do not have any corrosive and adverse effects on skin and fibres, whether woolen or cotton. Therefore, they need further investigation to develop plant derived natural soaps and detergents.

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