

Market Study of *Kustha* (*Saussurea lappa* C.B. Clarke.) an Important Himalayan Herb.

Lalit Nagar

PhD Scholar,

Department of Dravyaguna, Faculty of Ayurveda, IMS,
BHU, Varanasi.

Abstract: Due to excessive deforestation and extreme weather conditions adulteration of Himalaya herbs is rampant. There are about 50 medicinal plants from the Himalaya which are extensively used in Ayurvedic formulations out of which 32 plants are scarce and found adulterated in the market study. Moreover, to our misfortune, medical practitioners started depending upon the traders for obtaining the raw materials. Hence, the need for identification of these herbs through botanical surveys, pharmacognostic studies and the assessment of the quality of the material available in a particular area or market is essential.

Materials and Methods: The genuine root samples of *Kustha* i.e. roots of *Saussurea lappa* C.B. Clarke was collected from *Shatargala* Tehsil- Bhadarwa Dist. Doda State- Jammu and Kashmir along with its mentioned adulterants are collected from its native habitat. Market samples of *Kustha* from six major markets from all over India were collected and compared with the genuine samples.

Results: Samples from three markets of India matches with *Kustha* i.e. roots of *Saussurea lappa* C.B. Clarke. Samples from two markets were identified as roots of *Nagauri Ashwagandha* i.e. *Withania ashwagandha* and one market sample were identified as roots of *Pushkarmool* i.e. *Inula racemosa*. Quality of the market samples along with the price of the drug varies from market to market.

Discussion: This exclusive dependence on traders has created serious malpractice of adulteration and selling of substandard medicinal plant raw materials in the market.

Index Terms: *Kustha*, *Saussurea lappa*, Market Study, Adulteration.

Introduction:

Alpine range of Himalaya is the source of many valuable herbs used extensively in Ayurvedic, Tibetan and Chinese system of medicine. Major part of the year, these hills are kept under ice and for the vegetative growth herbs gets only five to six months. Also these herbs are present in the limited pocket which leads to the scarcity of Himalayan herbs. But due to the globalization demand is increasing and production is decreasing. This decrease in production gives chance to the raw drug traders to adopt unscrupulous trade. Modern day Ayurvedic physician depend on these drug traders for procurement of herbs. Moreover treatment with adulterated drugs leads to therapeutic unpredictability. Due to excessive deforestation and extreme weather conditions adulteration of Himalaya herbs is rampant. There are about 50 medicinal plants from the Himalaya which are extensively used in Ayurvedic formulations out of which 32 plants are scarce and found adulterated in the market study.¹ One of the important aspects which have added misery to the identification of some of the important medicinal plants or raw materials is interruption in the traditional practice of Ayurveda. Moreover, to our misfortune, medical practitioners started depending upon the traders for obtaining the raw materials. Hence, the need for identification of these herbs through botanical surveys, pharmacognostic studies and the assessment of the quality of the material available in a particular area or market is essential.

The Botanical source of *Kustha* constitute of dried roots of *Saussurea lappa* (C.B. Clarke.) belonging to family Asteraceae.² *Kustha* is well known both in the Ayurvedic and Tibetan medicine. It grows in the Northern temperate regions i.e. in the Himalayas at an altitude ranging from 8000- 13000 ft. above mean sea level.

Aim and Objective

There is a vast document available with regard to morphology of green drugs. However for physicians who are totally dependent on market for the procurement of medicinal plant raw materials, it is not of much

relevance even if he has sound knowledge of identification of green drug. Different parts of medicinal plant raw materials, in dry form, show different features most of which are being common to many drugs thus creating lot of confusion and controversy in identification of the crude drug. Same is the case with *Kustha* (*Saussurea lappa*). So to check the status of *Kustha* in markets a market study was done by the author in the department of Dravyaguna, NIA, Jaipur in the year 2012, which covers six major markets from all over India. Samples of *Kustha* collected from all the markets were compared with the genuine source collected from its native habitat.

Kustha i.e. root of *Saussurea lappa* C.B. Clarke. can be identified organoleptically by following points- It is woody, stout, fusiform, arched, and slightly twisted. Outer surface is saddle brown in colour having longitudinal wrinkles with ridges running straight or spiral. It does not explore minute particles on its fracture and shows cutting surface same as that of the cutting surface of Horn of deer (Chakrapani Dutta). A transverse cutting portion shows a brownish surface with three distinct regions i.e. periderm as thin outer blackish ring followed by a woody portion with fine radical striation and a central pith region. The root has peculiar characteristic and strong aromatic odour. It has a sweet taste in the start just for the few seconds and after that it has bitter taste.

Substitutes and Adulterants

Having same place of origin, some same synonyms and similarity in external morphology found in market sources; a great deal of confusion was existed as to which one is *Kustha* and which one is *Pushkarmool*. It is commonly known as 'Costus' in trade, it has however no connection with genus 'Costus'. In drug markets of northern India like Amritsar, Jaipur and Delhi, drug seller divides *Kustha* into bitter *kustha* (Kaduwa Kutha) and sweet *kustha* (Mitha Kutha). They sold *Nagauri Ashwagandha* by the name of Mitha Kutha and Kaduwa Kutha is *Kustha*. In Unani medicine *Saussurea hypoleuca* is mentioned as Madhura *Kustha* (Mitha *Kustha*). According to Pharasi practitioners, and writers, bitter *Kustha* is called as *Kust-E-Talkha* and Sweet *Kustha* is called as *Kust-E-Sirin*. They described sweet *Kustha* as "Orris root" which is the English name of '*Iris florentiana*'. On morphological analysis, it was revealed that the "Meetha kutha" is *Withania ashwagandha* i.e. *Nagauri Ashwagandha*, and "kaduwa kutha" is *Saussura lappa*.

In the trade two varieties of *Kustha* can occasionally be found as the root collected from Jammu and Kashmir that are larger in size, ridged and darker in colour and those from Lahaul - Spiti of Himachal Pradesh that are thinner and lighter in colour.³ Some allied species of *Saussurea* as *Saussurea hypoleuca*, *Saussurea ligularia* are used as substitute and adulterant to genuine *Kustha*. Beside from this, roots of *Senecio jaquemontianus*, *Arctium lappa*, *kyllingia triceps* are used as adulterants. As per the book "Vanoushadhi Darshika" written by Thakur Balvant Singh, mentioned, in south India '*Costus speciosus*' has been used in the name of *Kustha* in different preparation. The roots of *Inula racemosa* is a common adulterant and substitute of *Saussurea lappa*.

Methodology

Collection of genuine sample and their adulterants and substitute from the field:

An authentic source of *Kustha* i.e. *Saussurea lappa* roots were collected from the hills of *Shatargala* Tehsil-Bhaderwa, Dist. Doda, State- Jammu and Kashmir, the genuine root samples of *Pushkarmool* i.e. roots of *Inula racemosa* were collected from Bhadarwa Dist. Doda, State- Jammu and Kashmir and root samples of *Arctium lappa* was collected from the hills of *Sarthal* Dist. Kathua, State- Jammu and Kashmir. After collection Herbarium were made and authenticated at IIIM Jammu.

Table I- Date and place of collection of genuine samples.

Plant name	Date of collection	Place of collection	Herbarium account no.
<i>Saussurea lappa</i>	11-09-2012	Dist. Doda	17279
<i>Inula racemosa</i>	11-09-2012	Dist. Doda	13697
<i>Arctium lappa</i>	11-09-2012	Dist. Kathua	19370

Collection of Market Samples

Exclusive dependence on traders has created serious malpractice of adulteration and selling of substandard medicinal plant raw materials in the market. So it is mandatory to study the market samples to check the adulteration. Six markets from all over India were selected these six markets are Kullu (H.P.), Amritsar, Jaipur, Kolkatta, Mumbai and Kochi. Following points were kept in mind while collection of market samples. Markets samples were collected as such and not verified on spot. All the available grades were collected with the simple order method. Sample purchased or received from contacts were properly labelled, stored and subjected to investigation.

Table II: Collection of Market samples

Markets	Date of Purchasing or Receiving	Collector	Local name	Price (Rs/Kg)
Kullu	18-04-2012	Scholar	<i>Kuth</i>	240
Amritsar	05-04-2012	Scholar	<i>Kuth</i>	300
Jaipur	05-05-2012	Scholar	<i>Kustha</i>	180
Kolkata	10-04-2012	Contacts	<i>Koorh</i>	240
Mumbai	25-04-2012	Contacts	<i>Kustha</i>	800
Cochin	20-07-2012	Contacts	<i>Kottam</i>	220

Results:

All the samples collected from the markets were compared with the genuine sample and featured are presented in the tabular form.

Table III: Summarized Macroscopic Features

Sl. No.	Source	Appearance	Size	Colour	Odour	Taste	Fracture
1.	Genuine	Fusiform, conical and tapering, collapse in the centre having longitudinal wrinkles which anastomose and ridges running straight or spiral.	7-18 cm. long in length and 1.5-3 cm. in thickness.	Saddle Brown.	Strong and aromatic .	Start with little sweetness and then bitter.	Short and horny.
2.	Kullu	Fusiform, stout, slightly twisted, rough, having some brownish root let scars, wrinkles which anastomose and ridges running straight or spirally.	4-11 cm. long in length and 0.5-2 cm. in thickness.	Saddle Brown.	Strong and aromatic .	Start with little sweetness and then bitter.	Short and horny.
3.	Amritsar	Straight, stout, unbranched, more or less round in shape having longitudinal ridges, lenticels, and some rootlet scars.	5-9 cm. long in length and 2-4 cm. in thickness.	Khaki colour	Mild bitter and Sweet	Slightly bitter.	Tough and mealy surface.
4.	Jaipur	Straight, stout, unbranched, more or less round in shape having longitudinal ridges, lenticels, and some rootlet scars.	3-5 cm. long in length and 2-2.5 cm. in thickness.	Khaki colour	Mild bitter and Sweet	Slightly bitter.	Tough and mealy surface.

5.	Mumbai	Stout, cylindrical, arched, slightly twisted rough having some root let scars which are round and light-brown in colour, longitudinal striation.	4-10 cm. long in length & 1-2 cm. in thickness.	Dark Golden rod	Characteristic and camphoraceous.	Bitter.	Short and uneven.
6.	Kolkatta	Fusiform, stout, slightly twisted, rough, having some brownish root let scars, wrinkles which anastomose and ridges running straight or spirally.	5-9 cm. long in length and 1-1.5 cm. in thickness.	Saddle Brown	Strong and aromatic .	Start with little sweetness and then bitter.	Short and horny.
7.	Kochin	Fusiform, stout, slightly twisted, rough, having some brownish root let scars, wrinkles which anastomose and ridges running straight or spirally.	5-11 cm. long and 2-3 cm. in thickness.	Saddle Brown	Strong and aromatic .	Start with little sweetness and then bitter.	Short and horny.

Discussion and conclusion

After study all the samples, it had been observed that, the samples collected from the markets of Kullu, Kolkatta and Kochin were having all diagnostic characters & same appearance with the characters of roots of authenticated genuine sample of *Saussurea lappa*. In Amritsar Nagauri Ashwagandha was sold under the name 'meetha Kuth' after some inquiry the merchant told that it comes from Rajasthan and in Jaipur market it is sold by the name *Kustha* only, Jaipur merchant told that if somebody asked for Himalayan *Kustha* than we gave *Pushkarmool*. Mumbai sample was collected by source and *Pushkarmool* was sold under the name *Kustha*. After analyzing all samples average size was taken and among size the best sample was of Kochin sample.

In ancient days *Vaidyas* usually go to forest to collect medicinal plants and prepare the medicines by themselves. Therefore there was not much documented information with regard to morphology and identification of medicinal plants in Ayurvedic texts. However due to extensive industrialization and urbanization it has become almost impractical for Ayurvedic physician to personally procure the authentic drugs and therefore totally dependent on raw drug sellers and the middle men for procurement of medicinal plant raw materials. This exclusive dependence on traders has created serious malpractice of adulteration and selling of substandard medicinal plant raw materials in the market. So it is mandatory to study the market samples to check the adulteration.

References:

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