

ETHNOBOTANY OF LADAKH (INDIA) PLANTS USED IN HEALTH CARE

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ABSTRACT.—This paper puts on record the ethnobotanical information of some plants used by inhabitants of Ladakh (India) for medicine. A comparison of the uses of these plants in Ladakh and other parts of India reveal that 21 species have varied uses while 19 species are not reported used.

INTRODUCTION

Ladakh (elev. 3000-5900m), the northernmost part of India is one of the most elevated regions of the world with habitation up to 5500m. The general aspect is of barren topography. The climate is extremely dry with scanty rainfall and very little snowfall (Kachroo *et al.* 1976). The region is traditionally rich in ethnic folklore and has a distinct culture as yet undisturbed by external influences. The majority of the population is Buddhist and follow their own system of medicine, which has been in vogue for centuries and is extensively practiced. It offers interesting insight into an ancient medical profession.

The system of medicine is the "Amchi system" (Tibetan system) and the practitioner, an "Amchi." The system has something in common with the "Unani" (Greek) and "Ayurvedic" (Indian) system of medicine. Unani is the traditional system which originated in the middle east and was followed and developed in the Muslim world; whereas the Ayurvedic system is that followed by Hindus since Rig vedic times. Both are still practiced in India. Though all the three systems make use of herbs (fresh and dry), minerals, animal products, etc., the Amchi system, having evolved in its special environment, has its own characteristics. A prescription in the system usually consists of 2 to 5 herbs combined in various ways, supplemented by certain unique rituals. The individual expertise (or whim) of the Amchi is often the deciding factor for the dose and supplementary advice. In actual practice, the system is complicated and has to be learned after long years of study and training under experienced Amchis. The profession of an Amchi is a family affair and the knowledge passes from father to son. There are no institutions and no formal Amchi education. When an apprentice wants to be declared a full-fledged Amchi and practice independently, his guide, who is often his own father, calls a few experienced Amchis who conduct a sort of *viva-voce* examination. If the performance is satisfactory the apprentice is declared fit for practicing as an Amchi.

In view of the importance of the Amchi system over a vast tract of J&K state (India), efforts were made to collect and collate all available information on it to assess its relevance to the changing socio-cultural scenario in these highlands. This paper records medicinal uses of 40 plant species growing in the region.

METHODS

Periodic surveys of ethnic groups in remote areas of Ladakh have been conducted during a two and a half year period ending in October, 1986. The areas surveyed include:

1. Leh and adjoining villages 1-15th Aug. 1985
2. Diskit (Nubra valley) 16th-30th Aug. 1985
3. Lungna 15th-30th Sept. 1985
4. Panamik (Nubra valley) 15th May-2nd June 1986
5. Numa (Changthang) 5th-15th June 1986
6. Chumathang 1st-14th July 1986
7. Khalsi 16th-31st July 1986
8. Likir and Tamisgam 1st-10th Aug. 1986
9. Himis 12th-30th Aug. 1986
10. Himia 21st-30th Sept. 1986
11. Dumkhar 1st-7th Oct. 1986
12. Khardungla and Khardung 8th, 9th, 10th Oct. 1986
13. Pullu 12th, 13th Oct. 1986
14. Saspul and Nimu 14th, 15th, 16th Oct. 1986
15. Durbung 18th-25th Oct. 1986

The ethnobotanic information was gathered on fresh as well as dried plant specimens in the field through field interviews, conducted daily. On the final day of a survey, group discussions with knowledgeable old people, local priests (Lamas) and village heads were conducted to check uniformity of opinion regarding various uses of plants. Final confirmation was made by discussions with Amchis (local medicine men) and also through visits to the Amchi Research Center Leh (Ladakh).

After completion of field data, the dried specimens were identified in KASH (Kashmir University herbarium) using Hooker (1872-97), Kachroo *et al.* (1976), and Stewart (1917 and 1972). Voucher specimens are deposited in KASH.

ETHNOBOTANY

The species used medicinally in Ladakh (India) are arranged alphabetically. For each species the botanical name, family, voucher number, localname (in quotation marks) and curative use(s) are given.

Allium stoliczkaei Regel Alliaceae (IN 21)

"Skotse." The decoction of the dried bulb is given to women after delivery for energy. A decoction of the leaves is considered a remedy for constipation.

Anthriscus nemerosa Spreng. Apiaceae (IN 1130)

"Sunak." The sun-dried plants are powdered. It is claimed that the smoke of the powder, when inhaled, cures rheumatism and inflation.

Aster diplostephoides Benth. Asteraceae (IN 168)

"Utpal Vanpo." Dry or fresh flower heads are boiled in milk with a little sugar. The decoction is administered to patients suffering from cough and a low rate of respiration.

- Astragalus zanaskariensis* Benth. Papilionaceae (IN 39)
 "Chisigma." The sun-dried roots are powdered. The powder is dissolved in luke warm milk and given to expel intestinal worms. The extract of fresh roots is claimed to be effective against ring worm.
- Berberis ulicina* Hk.f.&T Berberidaceae (IN 146)
 "Sinskingnama." The dried fruits are administered orally against ring worm.
- Capparis spinosa* Lamk. Capparidaceae (IN 77)
 "Kabra." The leaves are placed in water for 2-3 days with continuous changing of water. Then leaves are boiled in fresh water with a little salt and given against hyperacidity and other stomach troubles.
- Caragana moorcroftiana* Benth. Papilionaceae (IN 55)
 "Takay vonpo." Fresh leaves are boiled in milk and cooled. Taken in the morning for a week, it is claimed to act as a blood purifier. The dry leaves are used as an antiseptic in powdered form.
- Carduus nutans* Linn. Asteraceae (IN 51)
 "Jangchar." Fresh leaves and roots are chewed to initiate vomiting in cases of indigestion.
- Carum carvi* Linn. Apiaceae (IN 34)
 "Kajnut." Leaves and fruits are boiled in water and cooled. The extract is taken as an antiacid and against digestive ailments. Bath in extract is claimed to cure rheumatism.
- Centaurea depressa* M.Bieb. Asteraceae (IN 12)
 "Vasaka." Luke warm extract of fresh leaves and seeds is used against cough, chest pains and fever.
- Chenopodium album* Linn. Chenopodiaceae (IN 14)
 "Janchikarpo." Leaves are boiled in water and cooled overnight. It is given against gastric troubles. An extract from seeds is used as a diuretic.
- Delphinium brunonianum* Royle Ranunculaceae (IN 62)
 "Chargosposz." Fresh leaves are crushed in a little water and made into a paste. the paste is given with bread against malaria.
- D. viscosum* Hk.f.&T. Ranunculaceae (IN 1261)
 "Bilamonokh." The fresh shoots and leaves are made into a paste. The paste is applied as a poultice on inflamed joints to relieve pain and edema.
- Ephedra gerardiana* Wall. Ephedraceae (IN 5)
 "Sephath." The decoction of aerial parts is used against bronchial troubles and liver diseases. It is also claimed to cure irregularities of menstruation.
- Hippophae rhamnoides* Linn. Elaeagnaceae (IN 2)
 "Shraman." Regular consumption of fresh fruits is claimed to be effective against asthma.

- Jaeskea oligosperma* (Grisb.) Knobl. Gentianaceae (IN 1189)
 "Tikta." The plants are consumed raw or sometimes prepared in milk and it is claimed to act as a blood purifier.
- Juglans regia* Linn. Juglandaceae (IN 69)
 "Starga." The dry kernal is roasted directly on fire and used for treatment of constipation. Bark in powder form is used as tooth powder.
- Juniperus macropoda* Boiss. Cupressaceae (IN 1168)
 "Shukpa." The extract of fresh seeds along with seed extract of *Polygonum hydropiper* is used as diuretic.
- Lactuca sativa* Linn. Asteraceae (IN 41)
 "Dums." Leaves are boiled in water with salt and allowed to cool. They are crushed and used against fever. Sometimes used against lack of appetite.
- Lepidium latifolium* Linn. Brassicaceae (IN 1261)
 "Seoji." The plants are crushed and made into a paste and applied as a poultice to cure rheumatism.
- Morina longifolia* Wall. Morinaceae (IN 801)
 "Agzaima." Seeds are crushed to obtain oil which is claimed to be a nutritive for children of 3-6 years of age.
- Myricaria germanica* (Linn.) Desr. Tamaricaceae (IN 166)
 "Umboo." A decoction of leaves is taken as a blood purifier.
- Nepeta brachypetala* Benth. Lamiaceae (IN 71)
 "Tiyanko." Seeds are dried, powdered and boiled in water. On cooling, the extract is used against hyperacidity.
- Onosma hispidum* Wall. Boraginaceae (IN 61)
 "Deemok." Fresh roots and leaves are boiled in milk and stored overnight. The decoction, if taken before breakfast, is claimed to stop blood vomiting and act as a blood purifier.
- Oxyria digyna* (Linn.) Hill. Polygonaceae (IN 1199)
 "Chumcha." The shoots are kept in lukewarm water and taken in the morning as an appetizer.
- Pedicularis oederi* Vahl. Scrophulariaceae (IN 108)
 "Lugrusserpo." The fresh seedlings are consumed raw in case of food poisoning.
- Plantago asiatica* Linn. Plantaginaceae (IN 1197)
 "Karache." The cooked or boiled leaves are used as a blood purifier.
- P. Himaliaca* Linn. Plantaginaceae (IN 106)
 "Tharum." Dried seeds in powdered form is dissolved in curds and used to cure diarrhoea.
- Polygonum Hydropiper* Linn. Polygonaceae (IN 301)
 "Chumerche." The seeds are placed in water and boiled for 2-3 days. On cooling, the extract is used as a diuretic and to decrease obesity.

- Prunus aremeniaca* Linn. Rosaceae (IN 431)
 "Phating." Oil extracted from the seeds (kernals) is given to women after delivery for energy. It is also used to stimulate growth of long, healthy hair.
- Saussurea taraxicifolia* Wall. Asteraceae (IN 171)
 "Psangjarpachan." The sundried rhizomes are powdered and added to preboiled milk. It is kept as such for 1-3 days and then used against fever.
- Saxifraga flagellaris* Willd. Saxifragaceae (IN 166)
 "Teetasarzing." Fresh aerial parts are crushed on a stone, a little water is added so that a paste is formed. It is applied on cuts and wounds as an antiseptic.
- Scutellaria heydei* Hk.f. Lamiaceae (IN 113)
 "Jimthiglae." Aerial parts are dried near fire and then powdered. An extract of the powder in water is used against eye trouble. The powder with curds is used as a diuretic.
- Sedum tibeticum* Hk. f. & T. Crassulariaceae (IN 435)
 "Sholo." Dry leaves in semicrushed form are used with curds as diuretic. It is also used to decrease obesity.
- Senecio kraschenninkovii* Schich. Asteraceae (IN 1193)
 "Unarswah." Fresh leaves are crushed and made into a paste. The paste is applied on the forehead to relieve headache and is sometimes used as a poultice on inflamed parts to relieve pain.
- Sisymbrium orientale* Linn. Brassicaceae (IN 1150)
 "Staga." The powdered seeds are rolled into small tablets with butter or milk and used as an appetizer and carminative.
- Swertia petiolata* Royal ex. D. Don Gentianaceae (IN 1139)
 "Zantik." The decoction of whole plant in milk is used against headache and bodyache.
- Thalictrum minus* Linn. Ranunculaceae (IN 42)
 "Chak-achoo." The aerial parts are kept in water for several days and boiled. The cooled extract is used as an eye sterilizer, also to cure gout and rheumatism.
- Waldhemia stoliczkai* (Cl.) Ostenf. Asteraceae (IN 1175)
 "Solo-marpo." The decoction of shoots and leaves is used in headache, fever and bronchial troubles. The extract is claimed to act as a blood purifier.
- W. tomentosa* (Dcne.) Regd. Asteraceae (IN 160)
 "Solo-kerpo." Achenes are consumed raw in acidity. The crushed, fresh leaves are applied as a poultice in arthritis.

DISCUSSION

Amchi System.—The region is rich in ethnic folklore and has its own deep rooted traditions which have been protected through centuries and are still practiced. The Amchi system is one of these traditions. It has been derived from the original

Tibetan system of medicine and whatever has been noted centuries ago is practiced even now, with some modifications here and there. The literature is in the Tibetan language and is not printed.

The people of Ladakh have lived in isolation for centuries though some eminent travelers like Fa-Hien (400 A.D.), Hyder Duglat (1534), Moorcraft (1819-1825), Cunningham (1864) have visited the region occasionally (Kachroo 1980). However, in 1974 Ladakh was formally opened to tourists. Modern amenities and facilities were introduced in the region which gradually initiated a change in the way of the life of Ladakhis. Medical facilities have also been provided but these are too few to meet the demands of the people scattered over such a vast track of land. The people are therefore largely dependent on Amchis, who are usually found in almost every village, even in places like Taksha, Tsaga, Tsemtsen, etc., which are more than 250 kms away from the headquarters of the region.

The Amchis enjoy more confidence than modern allopathic doctors, who are usually non-residents and cannot speak the Ladakhi language. Even though all the amchis are Buddhists, Muslims have equal faith in them. People who have personal experience with the system as patients, testify to certain miraculous cures where the modern allopathic system has failed to do them any good. There is no doubt that these experiences are authentic (Kachroo 1980), which probably accounts for the Ladakhi people not having fully accepted the allopathic system as an alternative to the Amchi system.

On professional visits, the Amchis carry a long, rectangular leather box around the middle of which is fixed a broad strip of leopard skin. It is believed that this strengthens the potency and efficacy of the drugs inside. The case usually contains different drug preparations in small leather bags which are provided to patients free, thus the treatment becomes cheaper and drugs easily available.

HERBAL MEDICINE

A large number of herbs, usually in combinations of 2-5, are used in the Amchi system of medicine. Often minerals, mineral water, treatment with water from hot water springs, brandings with red hot metals or burning vegetable matter (cauterization or moxibustion), puncturing of veins and mysticism (prayers) are recommended along with these herbs either to supplement their effect or to correct the undesirable effect. It, therefore, becomes difficult to distinguish physical effects of plant medicine from the psychological effects of accompanying rituals. The prescription for the treatment of a particular ailment is known as "yoga."

Some of the herbs have become popular with the Ladakhi's. The people are so familiar with these herbs that it becomes easy for them to collect and prepare desired combinations of these herbs on Amchi's advice. These are often seen preserved in every household to be prescribed or used for ailments like bronchial trouble, digestive and stomach ailments and eye trouble which are common in the region. Sometimes preparations from these plants are administered to patients without consulting the Amchi. These herbs include: *Astragalus zanaskariensis*, *Capparis spinosa*, *Carduus nutans*, *Carum carvi*, *Chenopodium album*, *Lactuca sativa*, *Nepeta brachypetala*, and *Plantago himaliaca*.

Comparison of plant use in Ladakh with other parts of the country are given in Table 1. The study revealed that only 6 species are used for the same or similar ailments in other parts of the country. These are *Carum Carvi*, *Ephedra gerardiana*, *Juglans regia*, *Nepeta brachypetala*, *Polygonum hydropiper* and *Thalictrum minus*. Some herbs used

medicinally in Ladakh are used for other than medicinal purposes elsewhere in the country. These are *Chenopodium album*, *Juniperus macropoda*, *Lactuca sativa*, *Lepidium latifolium*, *Morina longifolia*, *Myricaria germanica*, *Oxyria digyna*, *Prunus armeniaca*, and *Sedum tibeticum*.

These studies also reveal that 10 species, although found in neighboring countries (e.g., Pakistan, China (Tibet) and Soviet Central Asia), are restricted to Ladakh only. Of course, four species are specifically used for diseases like ringworm, constipation, food poisoning and arthritis. These include *Berberis ulicina*, *Allium stoliczkai*, *Pedicularis oederi* and *Waldhemia tomentosa*. The remaining six species have varied medicinal use.

A perusal of the literature also revealed that nine species are exclusively used in Ladakh as herbal medicine. These are: *Aster diplostephoides*, *Anthriscus nemerosa*, *Delphinium viscosum*, *Jaesckea oligosperma*, *Plantago himaliaca*, *Saxifraga flagellaris*, *Scutellaria heydei*, *Senecio kraschennikovii*, *Sisymbrium orientale*, *Swertia petiolate* and *Waldhemia nivea*.

Table 1. Comparison of uses of plants in Ladakh and other parts of India.

(1) Plant Species	(2) Use in Ladakh (Present study)	(3) Use in other parts of India	(4) Reference
<i>Allium stoliczkai</i>	For energy and as a remedy for constipation	Not reported	—
<i>Anthriscus nemerosa</i>	Against rheumatism and inflation	Not reported	—
<i>Aster diplostephoides</i>	Against cough and low rate of respiration	Not reported	—
<i>Astragalus zanaskariensis</i>	Against worms	Not reported	—
<i>Berberis ulicina</i>	Against ringworm	Not reported	—
<i>Capparis spinosa</i>	Against hyperacidity	As a vegetable in western India diuretic & expectorant	Vertak, 1980 Ann. Vol. II, 1950
<i>Caragana moorcrafftiana</i>	As a blood purifier and antiseptic	Not reported	—
<i>Carduus nutans</i>	To initiate vomiting	Flowers as a blood purifier	Ann. Vol. II, 1950
<i>Carum carvi</i>	Against digestive ailments & rheumatism	Against rheumatism As a spice	Vishnu-Mittre 1980 Ann. Vol. II, 1950
<i>Centauria depressa</i>	Against cough and chest pains	Not reported	—
<i>Chenopodium album</i>	Against gastric trouble	Seed as substitute for rice. Leaves as a vegetable	Dam & Hajra, 1980 Ann. Vol. II, 1950

Table 1. Comparison of uses of plants in Ladakh and other parts of India. (continued)

(1) Plant Species	(2) Use in Ladakh (Present study)	(3) Use in other parts of India	(4) Reference
<i>Delphinium brunonianum</i>	Against malaria	As a cardiac and respiratory depressant	Ann. Vol. III, 1952
<i>D. viscosum</i>	To relieve pain and oedema	Not reported	—
<i>Ephedra gerardiana</i>	Against bronchial and liver diseases	Against bronchial trouble in Northern India	Jain, 1980 Ann. Vol. III, 1952
<i>Hippophae rhamnoides</i>	Against Asthma	Against lung com- plaints. Against cuta- neous eruptions	Gupta, 1980 Ann. Vol. V, 1959
<i>Jaesckea oligosperma</i>	As a blood purifier	Not reported	—
<i>Juglans regia</i>	As tooth powder and treatment of consti- pation	Leaves for cleaning teeth, wood for furni- ture	Ann. Vol. V, 1959
<i>Juniperus macropoda</i>	As a diuretic	Wood for building construction works	Ann. Vol. V, 1959
<i>Lactuca sativa</i>	As a appetizer and against fever	As a salad plant	Ann. Vol. VI, 1962
<i>Lepidium latifolium</i>	Against rheumatism	As a fodder in Kashmir	Ann. Vol. VI, 1962
<i>Morina longifolia</i>	As a tonic	As an incense	Ann. Vol. VI, 1962
<i>Myricaria germanica</i>	As a blood purifier	As fuel/fodder in Northern India	Jain, 1980
<i>Nepeta brachypetala</i>	Against hyperacidity	Against hyperacidity in Eastern India	Vishnu-Mittre 1980 Gupta, 1980
<i>Onosma hispidum</i>	As a blood purifier	Cardiac stimulant For coloring food stuffs	Ann. Vol. VIII, 1969
<i>Oxyria digyna</i>	As an appetizer	As a salad plant	Ann. Vol. VII 1966
<i>Pedicularis oederi</i>	Against food poisoning	Not reported	—
<i>Plantago asiatica</i>	As a blood purifier	Against inflamatory conditions of urine/ genital tract	Ann. Vol. VIII, 1969
<i>P. himaliaca</i>	Against diarrhoea	Not reported	—

Table 1. Comparison of uses of plants in Ladakh and other parts of India. (continued)

(1) Plant Species	(2) Use in Ladakh (Present study)	(3) Use in other parts of India	(4) Reference
<i>Polygonum hydropiper</i>	As a diuretic and to decrease obesity	For fishing in Eastern India As a diuretic	Joseph & Khar-kongor, 1980 Ann. Vol. VIII, 1969
<i>Prunus armeniaca</i>	For energy and to stimulate growth of long hair	As a fruit and for extraction of oil	Ann. Vol. VIII, 1969
<i>Saussuria taraxicifolia</i>	As a remedy for fever	Not reported	—
<i>Saxifraga flagellaris</i>	As an antiseptic	Not reported	—
<i>Scutellaria heydei</i>	Against eye trouble and as a diuretic	Not reported	—
<i>Sedum tibeticum</i>	As a diuretic	As a pot herb	Ann. Vol. IX, 1972
<i>Senecio kraschennikovii</i>	To relieve pain and headache	Not reported	—
<i>Sisymbrium orientale</i>	As a carminative and appetizer	Not reported	—
<i>Swertia petiolata</i>	Against headache and bodyache	Not reported	—
<i>Thalictrum minus</i>	As an eye sterilizer and against gout and rheumatism	As a source of dye As a conjunctivitis in several parts	Vishnu-Mittre 1980
<i>Waldhemia stoliczkai</i>	Against headache, vomiting, fever, cold, cough and a blood purifier	Not reported	—
<i>W. tomentosa</i>	Against acidity and in arthritis	Not reported	—

CONCLUSION

The Amchi system is an age-old medicinal system developed in Tibet. The literature is in Tibetan language and is not printed. The people have more faith in this system than the allopathic system of medicine. Large numbers of herbs are used for the purpose and are often accompanied by certain specific rituals. The herbs listed in this paper give a mere indication of the association of a particular herb with a particular ailment. Like other systems, the Amchi system of medicine may have its merits and demerits, but it is very rich and offers an interesting study. Some of its

more important aspects may be tested in the light of modern scientific knowledge. Botanists can play an important role in establishing the correct identity of drugs. This may bring to light some very rare and unknown medicinal plants which grow wild here. The development, conservation and utilization on a scientific basis can help in socio-economic development of the region.

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