

Medicinal plants of cold desert Ladakh used in the treatment of stomach disorders

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The paper deals with 57 plants species belonging to 24 families used in the treatment of stomach disorders by the *Boto* (the Buddhists) tribal community of Ladakh, Jammu & Kashmir state. Plants parts used in the treatment of stomach disorders along with methods of preparation, dose of administration and duration of treatment is described. The traditional practitioners are called *Amchis* in Ladakh and the traditional medical system is principally based on Tibetan System of Medicine. The local people of the region still rely on traditional systems of medicine for curing stomach disorders and more than 60% tribal population is dependant on herbal remedies.

Keywords: Stomach disorders, Cold desert, *Amchi*, *Boto* tribes, Herbal remedies, Ethnomedicine, Medicinal plants

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Ladakh covers more than 70,000 sq km geographical area of Jammu & Kashmir state, which lies between 31°44'57"-32°59'57"N latitude and 76°46'29"-8°41'34"E longitude. Commonly referred as the land of Lamé, the high mountain land, a piece of land between earth & sky, etc. remains landlocked for more than 6-7 months every year, when temperature touches below -30°C to -70°C at various localities¹. The Ladakh region can be divided into 5 different valleys on the basis of location, river sites and geographical conditions, viz. Indus, Nubra, Changthang, Zaskar and Suru valley^{2,3}. The Himalayan region is well known for its valuable herbal wealth since ancient time. Similarly, the Ladakh Himalaya, which seems barren and devoid of vegetation at the first sight is very rich in herbal resources. India is a country of different traditional culture & tribes, and follow different custom and systems of medicine. *Ladakhi* medical practitioners popularly known as *Amchis*, follow the Tibetan System of Medicine, use numerous herbs for various ailments in their prescriptions and still looking after more than 60% of population⁴. Stomach disorders are usually found among every common men of Ladakh, which is mainly due to harsh climatic conditions, high altitudes region, low oxygen pressure and water related problems. Local herbal practitioners are successfully looking after these problems and curing

them. 57 medical plants species belonging to 24 families commonly used against stomach related problems by *Amchis* have been found in Ladakh region⁵. Some species of this region were also highlighted in some reports⁶⁻⁷.

Methodology

An ethno-medico-botanical survey of the region has been carried out for collection of specimen, traditional information and anthropological aspects in different seasons of the year for last 10 yrs. The queries were verified from well versed person like *Amchis*, aged person, village heads, etc., and data has been cross checked. Botanical specimens were identified with the help of various flora, monograms and herbaria of BSD, DD and J & K. Ethnobotanical information gathered during survey has been verified with the help of literature of Tibetan & Buddhists scholars, researchers and traditional practitioners. The practice of prescription, preparation of medicine by using medicinal herbs, has been observed at various locations in villages and cities.

Observations

The floral diversity of Ladakh has a great importance in ancient traditional systems of medicine due its multifarious uses among tribal society. The harsh climate, low oxygen pressure, high altitude conditions are the major factors, which creates many stomach related problems in human being. Local

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herbal practitioners are well versed with the use of plants along with minerals, salts and animal products, and curing efficiently more than half of the entire population. The plants of cold desert Ladakh used against stomach problems are described here and arranged alphabetically along with botanical name, family, vernacular name followed by uses.

Achillea millefolium L. (Asteraceae), *Gandana* (H), *Milfoli* (E), *Chuang* (L).

Uses: Leaf infusion is given thrice a day or is taken in the form of tea without milk and sugar against stomachache.

Aconitum heterophyllum wall. ex Royle. (Ranunculaceae), *Attees* (H), *Aconite* (E), *Bona-karpo* (L).

Uses: Root decoction one to two teaspoonful daily is given against stomachache. Two or three gm root powder mixed with other herbs, minerals & rock salt are taken thrice a day against stomachache, gastric, inflammation of intestine, abdominal pain, vomiting and as antidiabetic for 4-5 days.

Allium cepa L. (Alliaceae), *Piyaz* (H), *Onion* (E), *tSong* (L).

Uses: paste of fresh bulbs mixed with local mint, minerals and slats is used in small doses as appetizer and against vomiting.

A. przewalskianum Regel. (Alliaceae), *Jangali Lahsun* (H), *Wild garlic* (E), *Skotche* (L).

Uses: Ground leaf decoction is recommended against dysentery and stomachache twice a day in small doses directly with or without meal for 3-4 days.

A. sativum L. (Alliaceae), *Lahsum* (H), *Garlic* (E), *Sogpa* (L).

Uses: Two or three segments are usually taken in a routine with hot water twice daily to improve digestion and appetite.

Anemone rivularis Buch. (Ranunculaceae), *Kikisorng* or *Srub-kb* (L).

Uses: Fruits restore digestive heat of the stomach. One teaspoonful fruit powder is recommended with hot water in the treatment of indigestion twice daily for 3-4 days.

Arabidopsis himalaica (Edgew.) Schulz (Brassicaceae), *Byi'u laphug* (L).

Uses: One or two teaspoonful of whole plant extract is given twice a day to treat indigestion and to control appetite for a week.

Arabis glandulosa Kar & Kir. (Brassicaceae), *Umakno* (L).

Uses: One to two teaspoonful leaf extract is given for 5-7 days to treat abdominal pain and as digestive. It is used as a substitute of *Arabidopsis himalaica* (Edgew.) Schulz.

Artemisia brevifolia Wall. ex DC. (Asteraceae), *Kirmala* (H), *Worm seed* (E), *Khamchu* or *Phur-nag* (L).

Uses: Paste of leaves mixed with other herbs, minerals and rock salt is given twice or thrice a day against stomach problems and worms of intestine mainly in children for 5-7 days by *Amchis*. Two teaspoonful leaf extract is given twice a day for 5-7 days to treat worms of intestine and intestinal disorders. The bitter principal is reported to be an appetite stimulating.

A. dracuncululus L. (Asteraceae), *Little Dragon Mugwort* (E), *tsa-chheh* or *Shersing* or *Burtse* (L).

Uses: One to two teaspoonful leaf & flower extract is given twice a day to treat indigestion and intestinal disorders for 4-5 days.

A. gmelinii Web ex. Stechm. (Asteraceae), *Nurcha* or *Burtse* or *Khamchu* or *Burmak* or *Khampa shridi* (L).

Uses: One teaspoonful extract of leaves and flowers is given twice or thrice a day for 4-5 days against stomachache and abdominal upsets.

Berberis lyceum Royle. (Berberidaceae), *Daruhaldi* (H), *Berberry* (E).

Uses: Two to three teaspoonful fresh fruit extract is recommended against stomachache, intestinal problems and diarrhoea for 4-5 days.

Bergenia stracheyi (Hk. F. & T.) Engl. (Saxifragaceae), *Pashanbhed* (H); *Tiang* or *gatilas* (L).

Uses: In Zanskar areas, fresh and dry roots are directly chewed against stomachache.

Bunium persicum (Boiss.) Fedtsch. (Apiaceae), *Sahi Zeera* or *Kala Zeera* (H), Caraway black (E), Zeur (L).

Uses: Seeds are highly fragrant; taken directly with fresh water twice a day at the time of indigestion, dysentery and as carminative.

Carum carvi L. var. *gracile* (Apiaceae), *Kala Jeera* (H) *Umbu*, *Kosnyot* or *Go-nyod* or *Go- sNyod* (L).

Uses: Few seeds are taken directly with fresh water before sleeping and found useful as febrifuge, carminative and to promote digestion.

Clematis orientalis L. var. *acutifolia* Hk. f. et T. (Ranunculaceae), *Clematis* (E) *Tiktikma* or *dByi-mong dkar-po* (L).

Uses: Decoction of twigs and branches is given twice daily for 3-4 days for restoring digestive heat and against indigestion.

C. tibetana Kuntze. (Ranunculaceae), *Clematis* (E), *Zakgic* or *Bichho* or *Imong* or *dByi-mong nag-po* (L).

Uses: The twigs and branches promote digestion and are used as substitute of *C. orientalis*.

Dactylorhiza hatagirea (D. Don.) Soo. (Orchidaceae), *Salam Panja* (H), Spotted Heart Orchid (E), *ambolakpa* (L).

Uses: The tubers are powdered, mixed with powder of other herbs, minerals and soaked overnight in water. The mucilaginous mass is given twice or thrice a day to treat round worm of stomach for 4-5 days.

Daucus carota L. (Apiaceae), *Gajar* (H), Carrot (E), *Sarakhturam* (L).

Uses: Roots are eaten either raw or cooked, and considered useful against stomachache and dysentery.

Epilobium angustifolium L. (Onagraceae), Rose way willow herb (E), *Utpalwenabo* (L).

Uses: Decoction of whole herb is given twice a day up to 4-5 days against stomachache. The plant is also used in abdominal pain, intestinal and renal complaints.

Geranium pratense L. (Geraniaceae), Meadow Cranesbill (E), *Gugchuk* or *Ga-dur* (L).

Uses: Two or three teaspoonful fresh or dried leaf extract is given twice a day against dysentery and diarrhoea in *Amchis* System of Medicine for 4-5 days.

Herminium monorchis (L.) R. Br. (Orchidaceae), *Monorchis* (E), *Peo* (L).

Uses: Bulbs are used as a substitute of *Dactylorhiza hatagirea* (D. Don.) Soo.

Hippophae rhamnoides L. spp. *turkestanica* Rousi. (Elaeagnaceae), Seabuckthorn (E), *Tsermang* or *Sastalulu* or *Cherker* or *sTar-bu* (L).

Uses: Two or three teaspoonful fruit juice mixed with equal quantity of boiled cool water is taken orally to improve digestion.

Hypecoum leptocarpum Hk. f. et T. (Papaveraceae), Little Poppy (E), *Parpata* (L).

Uses: Whole plant is cooling in nature, bitter in taste. One teaspoonful decoction of fresh or dried plant is used twice a day to treat stomachache. Tablets prepared from the plant along with other herbs, minerals & rock salt are given twice a day for 3-4 days to control stomachache.

Meconopsis aculeata Royle. (Papaveraceae), Himalayan blue poppy (E), *Landrementok* or *Ut-Pal sngon-po* or *Achatsarmum* (L).

Uses: Whole plant extract is given twice a day in small doses against stomachache for 4-5 days.

Mentha longifolia L. (Lamiaceae), *Jangali Pudina* (H), Horse Mint (E), *Pholoing* (L).

Uses: Paste of leaves and tender shoots mixed with garlic and little salt is given thrice a day to control dysentery, diarrhoea, stomachache and vomiting.

Morina longifolia Wall. (Dipsacaceae), *Kim* (L).

Uses: One teaspoonful whole plant decoction is given twice a day for 3-4 days against indigestion.

Nepeta coeruleascens Maxim. (Lamiaceae), Catmint (E), *Neimlo* or *Khora* (L).

Uses: One teaspoonful whole plants decoction is used twice a day for 3-4 days against dysentery and stomachache.

N. erecta Benth. (Lamiaceae), *Eripantso* (L).

Uses: Whole herb decoction is used as a substitute of *Nepeta coeruleascens* Maxim.

N. glutinosa Beth. (Lamiaceae), *Jatukpa* (L).

Uses: One to two teaspoonful extract or decoction prepared from dried flowers and leaves is used twice a day for 3-4 days against diarrhoea, dysentery and stomachache.

Ocimum basilicum L. (Lamiaceae), *Van Tulsi* (H); Wild mint (E).

Uses: Leaves mixed with local mint and salt are made into round balls; 1-2 balls are taken directly with boiled water against stomachache and vomiting.

Origanum vulgare L. (Lamiaceae), Wild Marjorum or Wild origano (E.).

Uses: A strongly scent plant, is sometimes used as a substitute of *Thymus serpyllum* L.

Oxyria digyna (L.) Hill. (Polygonaceae), Mountain Sorrel (E), *Lamanchu* or *Chu-Lchum* (L).

Uses: Two teaspoonful leaf decoction prepared in hot water is taken thrice a day for 4-5 days to improve digestion and gastritis.

Pedicularis cheilanthifolia Schrenk. (Scrophulariaceae), *Zunmar* or *Monomosing* or *Kikimo* or *Lug-ru-ser-po* (L).

Uses: One teaspoonful extract of whole herbs is used twice a day for 2-3 days against stomachache.

Peganum harmala L. (Zygophyllaceae), Wild Rue (E), *Sepan* (L).

Uses: Powdered seeds are given twice a day in small doses to treat stomachache for 2-3 days.

Picrorhiza kurrooa Royle ex Benth. (Scrophulariaceae), *Kutki* (H), *Hanglang* (L).

Uses: Roots are best sources of bitter tonic; used in small doses against stomachache up to one week.

Plantago depressa Willd. (Plantaginaceae), *Tharam* or *Rambusuk* (L).

Uses: Two teaspoonful infusion of whole plant is given twice a day up to one week against stomach pain, dysentery and as antidiarrhoeal.

P. major L. (Plantaginaceae), Ripple Grass (E).

Uses: Whole plant infusion is used as a substitute of *Plantago depressa* Willd.

Polygonatum verticillatum (L.) All. (Liliaceae), *Mitha dudia* or *Salam dana* (H), Whorled Solomon's seal (E), *Ra-mnye* (L).

Uses: Roots are appetizer and stores digestive heat. Roots mixed with other herbs, minerals & salts are powdered and made into round tablets. Either three tablets or 2-3 gm powder is taken with boiled water for a week to promote appetite.

Prangos pabularia Lindl. (Apiaceae), Prangos (E); *Prangs* or *Palano* (L).

Uses: Root infusion is given twice a day in small doses up to one week or more to cure indigestion. Seeds are considered as carminative.

Ranunculus trichophyllus Chaix. (Ranunculaceae), Water Crowfoot or Water fennel (E), *Rengo* (L).

Uses: Whole plant decoction is used twice daily for 3-4 days against diarrhoea.

Raphanus sativus L. (Brassicaceae), *Muli* (H), Radish (E), *Labook* (L).

Uses: Roots are eaten either raw or cooked with common salt, and are considered useful against chronic diarrhoea.

Rheum webbianum Royle. (Polygonaceae), Himalayan Rhubarb (E), *Lachhu* or *Chu-rtsa* (L).

Uses: Powdered roots, leaves and leaf-stalk are considered laxative and sometimes given in small doses against indigestion and abdominal disorders.

Rubia coradifolia L. (Rubiaceae), *Manjith* (H), Indian Madder (E), *bTsod* (L).

Uses: Powdered stems and roots given in small doses with water for 3-4 days are found effective against stomachache and indigestion.

Saussurea jacea (Klotz.) Cl. (Asteraceae), *Pashuk* or *Shirut* (L).

Uses: One teaspoonful whole plant extract is given twice a day for 2-3 days to overcome stomachache.

Sedum ewersii Ledeb. (Crassulaceae), Stone Crop (E), *Shurupa* or *Gomni* (L).

Uses: Decoction of young shoots and leaves with little salt is given twice or thrice a day for 3-4 days or more to control dysentery.

Senecio chrysanthemoides DC. (Asteraceae), *Trubelamindho* or *Heching rGu-drus* (L).

Uses: Whole plant extract is given in small doses twice a day for 2-3 days against dysentery.

Sisymbrium sophia L. (Brassicaceae)

Uses: One teaspoonful powdered seeds are given thrice a day for 4-5 days with fresh water against stomachache.

Solanum nigrum L. (Solanaceae), *Makoi* (H), Black nightshade (E), *Tsigma* (L).

Uses: One teaspoonful fresh decoction of young leaves is used twice a day for 2-3 days to treat stomachache.

Sorghum vulgare Pers. (Poaceae), *Jawar* (H), Sorghum (E), *Toue* (L).

Uses: Grains having cooling properties; eaten boiled improve constipation, appetite and taste. Decoction is also used twice or thrice a day for 3-4 days.

Swertia thomsonii Cl. ex Hk. f. & T. (Gentianaceae), *Tikta* (L).

Uses: One teaspoonful whole plant decoction is given thrice a day for a week or more against stomachache.

Tanacetum dolichophyllum (Kitam.) Kitam. (Asteraceae), *Tansy* (E), *Khampaserpo* (L).

Uses: Decoction of leaves and flowers are given in little doses for 7-8 days against intestinal worms.

T. gracile Hk. f. & T. (Asteraceae), *Khamchu* or *Thorshokma* (L).

Uses: Decoction of leaves and flowers is given in small doses against intestinal worms mainly in children.

Taraxacum officinale Wigg. (Asteraceae), Common Dandelion (E), *Han* or *Khurmano* or *Sanma* or *Yamngi* (L.)

Uses: A small quantity of root extract or powder is taken two or three times daily to treat disorders of stomach and intestine caused by intestinal worms and due to indigestion. Tablets are prepared from the plant combined with other herbs, minerals & rock salt. Two three tablets are taken with boiled water thrice a day for 4-5 days against stomachache.

Thlaspi alpestre L. ex Hk. f. & T. (Brassicaceae), vern: *Bumbuk* or *Bre-ga* (L).

Uses: Whole plant decoction is consumed with little salt to improve digestion.

Thymus serpyllum L. (Lamiaceae), *Jangli Ajwain* (H), Creeping thyme (E), *Tumbrak* (L).

Uses: Whole plant infusion is quite effective against stomachache and gastrointestinal problems.

Zea mays L. (Poaceae), *Makka* (H), Maize or Corn (E), *Manmeselotok* (L).

Uses: Fresh or dried boiled grains eaten with salt are considered to be useful against stomachache.

Discussion

Ladakh is very harsh and cold region of our country which remains cut off from rest of the country for more than 6-7 months every year thus, communication is not easy and local people depend upon wild resources for their daily needs. Although good medical facilities are available but local population of different villages still depend on traditional system of medicine. The stomach related problems among local population are cured by traditional *Amchis* with the help of medicinal plants. *Amchis* are skilled in the treatment of various stomach related problems such as stomachache, gastritis, indigestion, dysentery, diarrhoea, constipation, vomiting, appetite stimulating, internal worms, etc. 57 plants species belonging to 24 families are used in treatment of various stomach related disorders. Out of 27 species used against stomachache, 16 species are used against indigestion, 12 against dysentery, 8 against diarrhoea, 6 species each against internal worms and as appetizer, 4 species each against intestinal disorders, vomiting, 3 species each against gastritis and as carminative, single species *Sorghum vulgare* against constipation and *Aconitum heterophyllum* against diabetes. The traditional systems rely on potentiality of wild herbs for the treatment; the cultivation is almost negligible however, few species were found to be grown in house gardens of *Amchis*. Due to over exploitation, the valuable resources of Ladakh is on the verge of extinction. Therefore, conservation of rare and endangered species of cold desert by involving research institutions and state departments through establishment of medicinal park, herbal gardens, *ex-situ* and *in-situ* conservation, and cultivation will be beneficial for overall development of the region and sustainable utilization of these wild resources in future.

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