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Original Research Article

Ethnobotanical Study of the Plants Used by the Local People of Gulmarg and its Allied Areas, Jammu & Kashmir, India

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Abstract

Ethnobotany is the scientific study of the relationships that exist between people and the plants. Ethnobotany aims to document the valuable knowledge of the tribal regarding the use of plants. The tribal people use the plants in their unique ways for various purposes mostly for the treatment of various diseases. There is a need to document this valuable knowledge as it is draining off at a rapid speed. An initiative was taken to document the ethnic knowledge regarding the medicinal plants in the Gulmarg and its allied areas in Kashmir Division of Jammy and Kashmir. During the survey about 80 plants, used for treatment of various diseases and aliments were documented. These plants are used for the treatment of various diseases like headache, toothache, epilepsy, gastric problems, skin disorders, pneumonia, jaundice, etc.

Keywords

Endangered

Ethnic

Ethnomedicinal plants

Tribal people

Introduction

Ethno botany is the study of how people of a particular culture and region make use of indigenous plants. Ethno botanists explore how plants are used for such things as food, shelter, medicine, clothing, hunting and religious ceremonies. Ethno botany, in its totality, is virtually an old field with new dimensions of research, and if this field is investigated thoroughly and systematically, it will yield results of great value missing the ethnologists, archaeologists, botanists and linguists and ultimately to pharmacologists and phytochemists. It appears to be a bridge between botany and medicinal plants (Rehman, 2013). Ethno botanical information on medicinal plants and their use by indigenous cultures is useful not only in conservation of traditional cultures, but also for community health care and drug development (Farooq et al., 2014). Historically the knowledge of the medicinal plants was restricted to few specialized herbal healers in rural communities, thus much of their use was seen as being primarily of local interest. For the past 2 decades medicinal plants has been increasingly recognized for their role in improving the economic status of rural people, who sell these plants in markets worldwide. Threatened medicinal plants have become the focus of world attention because they represent an extending flora which need protection and conservation and because of their role as an essential commodity for health care. The use of plants in modern medicine has considerably increased, on the other hand, traditional knowledge is gradually decreasing due to rapid urbanization and dependence of man on modern health

care systems, but this folk system still prevails in the rural communities (Ahmad et al., 2014). The use of medicinal plants for the treatment of diseases and infection is as old as mankind. Therefore many indigenous plants are used in traditional medicine to cure diseases and infections. These ancient and indigenous medicinal practices were discovered but then could not be proven by scientific theories, but the results have been beneficial and efficient to the people (Adachukwu and Yusuf, 2014). Now due to the zeal and zest of the workers the present demand for the ethno medicinal plants is approximately $14 billion per year (Sharma, 2004).

India is one of the 17 mega biodiversity countries in the world. It has 45000 plant species, out of which 15000-20000 plants have medicinal values (Arti et al., 2014). India has 10 of the world's biodiversity wealth which is distributed across 16 agro climatic zones (Rout et al., 2010). India and China are two of the largest countries in Asia which have the richest arrays of registered and relatively well known medicinal plants. India has a rich wealth of medicinal plants and is unique in that these plants are used by all sections of people either directly as folk remedies or in different indigenous systems of medicine or indirectly in the pharmaceutical preparations of modern medicine. The knowledge of medicinal plants has been accumulated in the course of many centuries based on different Indian systems of medicine such as Ayurveda, Unani and Siddha (Lone et al., 2013). WHO has listed over 21000 plant species used around the world for medicinal purposes. In India, about 2500 plant species are being used in indigenous systems of medicine. The Red Data Book lists 427 Indian medicinal plant entries on endangered species, of which 28 are considered extinct, 124 endangered, 81 rare and 34 insufficiently known (Akshay et al., 2014). In India a large population known as tribal lives in forests. Tribal people are ecosystem people who live in harmony with nature and maintain close link between man and environment (Himangshu Bikash Das et al., 2009).

Kashmir Himalaya, perched at the North- Western tip of the Himalayan Biodiversity Hotspot, supports a rich and spectacular biodiversity of great scientific curiosity and promising economic benefits chiefly owing to its topographical variations spanning from valley floor through terraced lands and dense forests up to snow capped alpine peaks (Khuroo et al., 2007). In western Himalayas, indigenous species are traditionally used by the locals for problems including acne (16%), hair growth (11%), bad teeth (12%), facial spots (9%), fairness (18%), wrinkles (8%) and eyes and lip care (9%) (Shaheen et al., 2014). Koushalya Nandan Singh (2013), conducted ethno botanical surveys in the entire Lahaul- Spiti region of Indian Western Himalayas to highlight the traditional uses of medicinal plants by the native people. The results revealed that tribal communities of both Lahaul – Spiti valley have a great respect for and faith in Amchi system of medicine practiced in the entire region. Since ages through trial and error, people in the Himalayan region have learned and practiced the medicinal usage of plants growing in their close vicinity for treating various ailments. The priced ancient wisdom usually been disseminated verbally requires to be documented urgently. Kashmir has been occasionally been explored by a number of botanists prominent among them are Victor Jacquement (1801-1832), Baron Von Huegal and Godfrey Thomas (1836-1838), Royals Collectors (1833-1839), W. Moorcroft and G. Trebeck(1841), J. E. Winterbottom(1846), Thomas(1847), Schalgintweit brothers (1854-1857), G.Handerson and A. O. Hume (1873), William Hey (1862), J. L. Stewart(1868) and J. F .Duthie (1892-1893). The early 20th century saw the work of A. Meebold (1905), F. Hallbarg (1921). B. O. Coventry(1925), E. Blatter (1927-28), Walter Koelz (1930), S. k. Mukherji (1940) and W. J .Lambert(1933) who published their work in the form of manuals and floras. Their work was followed by that of F. W. Pennel (1943) and F. Ludlow (1951). In recent years R. R. Stewart and T.A Rao from BSI extensively explored many places with a view to prepare comprehensive flora of the region. While R. N. Chopra and his co-workers published a series of papers on the medicinal and aromatic plants of the area (Dutt et al., 1963 and 2015). During the last half century only few studies have been carried out to document the ethno medicinal plant species growing in the region particularly in the remote and difficult terrains (Malik, 2010).

The valley of Kashmir is known for its beauty all over the world is also rich in herbal and floral wealth. The interest in knowing and admiring the plants in Kashmir has existed since times immemorial. In Kalhana's Rajtarangini (1149-50 A.D), we find mention of preservation of plants and plant products for medicinal purposes. Sir Walter Lawrence in his 'Valley of Kashmir' has observed that 'Kashmiris turn nearly every plant to some use and attribute medicinal properties to every growing thing'.

Kashmir Himalaya harbours diverse habitats which support a rich floristic wealth that has been used as a source base by its people since times immemorial, Kashmir valley provides home to a large number of plant species. The hospitable approach is not only restricted to native species but to exotic as well (Aslam et al., 2010).

Indeed Kashmir is known for its economically valued plants and their products such as medicine, fodder, fibre etc. Owing to the rich and unique floristic diversity a good proportion of plants are used as medicine in one form or other. The ethnic use of some of these herbs in medicine through folklore as well as in the document form dates back to 3000-1000 B. C and was in all probability the only means of curing and protecting the human population from various diseases. The shrinking population of some plants on account of very high demand for medicinal purposes is a matter of great concern as these plants are the backbone of our traditional medicinal system with a large population still depending on traditional medicine.

Therefore, the need to conserve these plants is of utmost importance because if necessary conservation measures are not taken at the earliest, the day will not be far away when these God gifted resources will completely deplete from their natural habitats (Lone et al., 2014).

The Kashmir Himalaya has rich diversity and many medicinal plants grown in this area. But about 70% of the identified medicinal plants are exposed to destructive harvesting (Dar et al., 2004). In J & K, India, law enforcement has banned the collection of the medicinal plants from the wild except for the Gaddi, Gujjars and Bakarwal tribes who are permitted to collect the species for their personal uses only. As a consequence, knowledge of medicinal plants lies with tribes only. (Dutt et al., 2015).

In recent times serious threats of bio-piracy and intellectual property rights with huge economy at stake, have necessitated the early bio-prospecting of the potential medicinal plants used in the folklore. In this process the first and foremost step would be the documentation of ethno medicinal uses of plants. Simultaneously this indigenous knowledge could be translated into commercial products on industrial scale with benefit sharing with all stake holders. Such a strategy would ensure that our bio resources are not pirated (Wagay, 2014).

Materials and methods

Study site (Fig. 1)

Country--------- India
State---------- Jammu & Kashmir
District--------- Bara Mullah
Elevation------- 2, 690 m (8,830 ft)
Language------- Kashmiri, English, Urdu and Pahari.

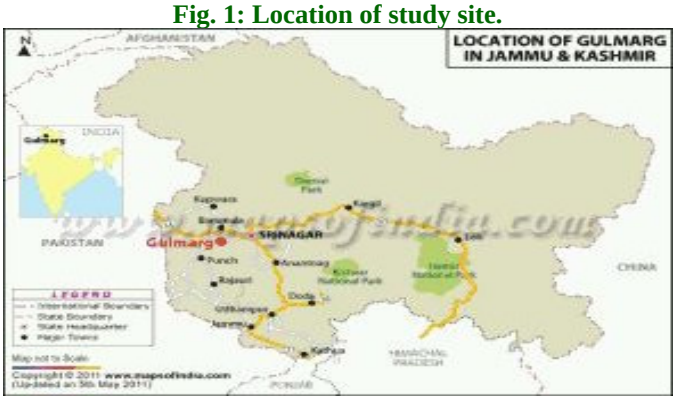
Gulmarg *(meadow of flowers) is a town, a hill station, a popular skiing destination and a notified area committee in Bara mullah district in the Indian administration state of J & K. The town is within the Himalayas and is within miles of the loc between India and Pakistan.*

Geography

Gulmarg is located 52 km from Srinagar. It has an average elevation of 8, 825 ft. Gulmarg is easily accessible from Srinagar, the capital of j & k in less than 2 hours by bus or car. Just 1 hour on the way is the town of Tangmarg. The adjoining areas of Gulmarg are *Tangmarg, Khilanmarg, Ferozpora, Drang and Baba Reshi.*

The local people have a good knowledge of the use of plants. The people still use many plants as medicines. The knowledge of the medicinal uses of plants is has been transmitted from one generation to next orally. It is mandatory to document the knowledge of these local people before the knowledge will drain off.

Fig. 1: Location of study site.



Methodology

The field trips were conducted in the area of study during March-April 2015. Many elderly people were consulted from the area. They provided us with ethnic knowledge regarding the medicinal plants and we noted

their information in a notebook. Also, hakeems were consulted who also gave some information to us. The information given by these persons were verified by confirming it from at least five other persons. The plants listed were searched with the help of volunteers' and the photographs of the plants were taken in their natural habitat with a digital camera and documented. Some of the data have been taken from internet and the library of Uttaranchal College of Science and Technology, Dehradun.

Results and discussion

A list of 59 plants belonging to 32 families was documented. These plants are used for various diseases and ailments like jaundice, rheumatism, headache, kidney stones, toothaches, constipations, skin disorders etc. The ethnomedicinal plants used by the local people of the Gulmarg and its allied areas are given in Table 1 and some important ethnomedicinal plants are given in Fig. 2.

Table 1. The ethnomedicinal plants used by the local people of the Gulmarg and its allied areas.

Botanical name	Local name	Family	Part used	Ailment/ disease	Method of use
Allium cepa	Ghande	Liliaceae	Bulb	Bee sting	Cut the onion into pieces and rub the pieces on the affected parts.
				Sprain	Chop raw onion and tie over the sprain with a cloth.
				Headache	The paste of the onion bulb is applied on the forehead to cure headache.
Juglans regia	Doon	Juglandaceae	Bark of root	Plaque	Rub the bark of the root on the teeth, it kills germs and reduces plaque.
			Kernal	Bed wetting	Give 2-3 kernels long with few raisins to the child before sleeping for 10-15 days.
			Leaves	Ulcers and freezing injury of feet	The leaves are boiled in water and the mixture is used to wash the feet.
Lavetera kashmeriana	Saz-posh	Malvaceae	Flower	Sore throat	Make the paste of the flowers and tie it on the throat with the help of a cloth.
Prunus dulcus	Badam	Rosaceae	Fruit	Toothache	Burn the shells of almond and use the ash as tooth powder.
Datura stramonium	Datur	Solanaceae	Seeds	Toothache	Treat the affected tooth with the smoke of the burning seeds.
Taraxaccum officinale	Haend	Astreaceae	Shoot	Fracture	Tie the fried shoot on the affected part.
				Weakness after delivery	The plant is cooked and is served to the women after their deliveries.
Pinus wallichiana	Kayur	Pinaceae	Resin	Influenza	Resin mixed with milk is taken twice a day for 5-10 days.
				Cracked heels	The resin is applied on the heels after cleaning with warm water.
Achillea millifolium	Pahail-gasseh	Asteraceae	Leaves	Tooth ache	Fresh leaves are chewed to cure the tooth ache.

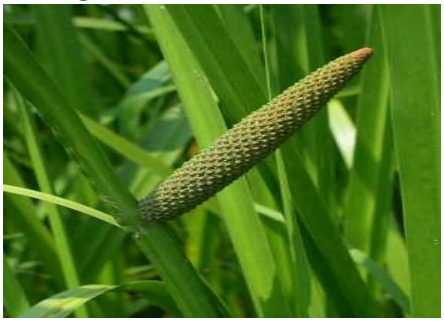
Botanical name	Local name	Family	Part used	Ailment/ disease	Method of use
Prunus aremeniaca	Chaire kuj	Rosaceae	Kernal	Skin disease and rheumatism	Kernel is heated and then pressed to obtain the oil which is used against skin disease & rheumatism
Cedrus deodara	Deodar	Pinaceae	Headache and rheumatic pain	Stem and bark	Oil extracted from the stem and bark is use to massage the body to get relief from rheumatic pain & headache.
Corriandrum sativum	Dhanival	Apiaceae	Leaves Leaves	Insomnia Jaundice	Paste of the leaves is applied on fore head to induce sleep. 1-2 teaspoon fresh juice of leaves is mixed in 1 cup butter milk and taken 2-3 times daily.
Prunus vulgaris	Kulwauth	Lamiaceae	Flower tops	Headache	The flower tops are boiled in water and the mixture is used to cure headache and fever.
Hyoscyamus niger	Bazaar bhang	Solanaceae	Seeds	Toothache	The seeds are burned and the ash is used as tooth paste.
Vitis vinefera	Daech	Vitaceae	Leaves	Skin rashes	Fresh leaves are tightly tied with a cloth on the skin rashes and sores.
Cannabia sativa	Bhang	Cannabaceae	Leaves	Lice and dandruff	Leaf juice applied on hair removes lice and dandruff.
Allium cepa var.aggregatum	Pran	Liliaceae	Leaves	Fracture	Tie the fried leaves on the affected part.
Urtica dioica	Soi	Urticaceae	Roots	Pain in joints and cysts of feet	The roots are grinded and then boiled in mustard oil. The mixture is used against cysts of feet and against pain in joints.
Rumex dentatus	Abej	Polygonaceae	Roots	Constipation	Extract of roots is taken in quality of 2 teaspoons in a cup of tea, 2 times a day for 15-20 days for curing constipation.
Dioscorrea deltoidea	Kraeth	Dioscoraceae	Leaves	Weak eye sight	The juice obtained from the leaves is used as eye drops to treat weak eye sight and infection of eyes.
Podophyllum hexandrum	Wan wangun	Berberidaceae	Fruit	Gastric problems	Fruit is eaten in gastric problems.
Arnebia benthami	Kah zabaan	Boraginaceae	Roots	Pneumonia	The roots are added to tea and the tea is given to persons suffering from pneumonia.
Foeniculum vulgare	Badiyan	Apiaceae	Seeds	Abdominal pain	Tea prepared from the seeds is used to cure abdominal pain in children.
Capsicum annum	Wazul marchivangun	Solanaceae	Fruit	Dog bites	The fruit is rubbed on the affected part.
Papaver somniferum	Khash khaash	Paperveraceae	Seeds	Weak memory	The seeds are mixed with warm milk and taken early in morning for 15-20 days.
Morus alba	Tul	Moraceae	Leaves	Wounds	Chew the leaves and then tie on the wound.
Trigonella foenum-graecum	Meth	Fabaceae	Seeds	Fever	Tea made by boiling the seeds of fenugreek is effective against fever.
Cuscuta parastica	Koekli poth	Cuscutaceae	Whole plant	Cold	The soup made by boiling the plant in water is used.

Botanical name	Local name	Family	Part used	Ailment/ disease	Method of use
Artemesia absinthium	Tethwan	Asteraceae	Leaves & inflorescence	Stomach pain	Paste of dried leaves and inflorescences mixed with warm milk is used to cure stomach pain.
Saussurea simpsoni	Jogi Badshah	Asteraceae	Shoot	Boils	The paste of the shoot is applied on the boils.
Acorus calamus	Vai-gander	Acoraceae	Rhizome	Gastric problems	Paste of the rhizome mixed with small quantity of sugar is used to cure gastric problems.
Calendula officinalis	Hamesh bahar	Asteraceae	Shoot Leaves	Wounds Earache	The shoot is grinded and the paste is then applied on the wounds. In case of earache, the juice of the leaves is put into the ears.
Cydonia oblonga	Bomi chounte	Rosaceae	Seeds	Boils	Boil the seeds in water & wash the affected part with the mixture,
Allium sativa	Rohun	Liliaceae	Clove	Hyper tension	Eat roasted garlic cloves regularly.
Helianthus annum	Gul aftab	Asteraceae	Seeds	High cholesterol	Eating of seeds regularly reduces the cholesterol level in the arteries.
Rheum emodi	Pumchalan	Polygonaceae	Rhizome	Foot ulcers and boils	Apply the paste on the affected part.
Malva sylvestris	Sochal	Malvaceae	Ariel portion	Weak eye sight	Recipe of herb is given to increase eye sight,
Veronica persica	Poeatkaich	Scrophulariaceae	Whole plant	Dermatitis	The plant is crushed into powder and the powder is mixed with mustard oil to make a paste. The paste is applied on the affected part.
Viscum album	Kaw khoor	Loranthaceae	Fruit	Epilepsy	The fruit is dried and powdered. The powder is added in milk and taken twice a day for 10 days.
Zea mays	Makai	Poaceae	Stigma	Kidney stones	The silk of the corn is made into tea and the tea is taken twice a day for 2 weeks.
Cotula anthemoides	Thul bobul	Asteraceae	Shoot	Fracture	Poultice of the shoot is applied on fractured bones and tied with woollen cloth at night for 5-10days.
Triticum aestivum	Kaenak	Poaceae	Seeds	Worms	Seed decoction is given to children for the treatment of worms.
Viburnum grandiforum	Kulmanch	Caprifoliaceae	Seeds	Typhoid	Seed juice is used to treat typhoid and whooping cough.
Jurienea dolomiaea	Jhari Dhoop	Asteraceae	Roots	Fever	The decoction of roots is given in case of fever after child birth.
Valeriana jatamansi	Jatamansi	Caprifoliaceae	Roots	Headache and wounds	Paste of the roots is mixed in water and is applied on forehead to relieve the pain. The paste of the roots is applied on wounds for better healing.
Aconitum heterophyllum	Patris	Rannunculaceae	Seeds	Tonsillitis	The crushed seeds are mixed with honey and applied on throat.
Solanum niger	Kambai	Solanaceae	Leaves	Swollen testicles	Hot leaves are applied with gratifying results over swollen scrotum and testicles.
Galinsoga parviflora	Marchiwangan ghaseh	Asteraceae	Whole plant	Joint pain	Fresh plants are crushed and the poultice is tied on the joints.

Botanical name	Local name	Family	Part used	Ailment/ disease	Method of use
Conyza Canadensis	Shallut	Asteraceae	Shoot	Stomach gases	Fresh leaves are eaten to relieve stomach gases.
Codonopsis ovate	Bidli	Campanulaceae	Ariel part	Ulcers and wounds	The poultice of the aerial plant is applied on the affected areas.
Lychnis coronaria	Shosh-gasseh	Caryophyllaceae	Roots and flowers	Lung and liver disorders.	Extract of roots and flowers is used to cure lung and liver disorders.
Plactranthus regosis	Sloi	Lamiaceae	Leaves	Snake bites	Leaf extract is mixed with water or milk to form syrup which is orally taken against snake bites.
Dactyorhiza hatagirea	Salem panja	Orchidaceae	Tuber	Pyorrhea	The juice extract from the tuber is used for the treatment of pyorrhea i.e. inflammation of gums.
Inula recemosa	Poshkar	Asteraceae	Root	Hypertension	Extract of the root is taken orally
Digitalis lanata	Dastana	Schrophuilaraceae	Leaves	Cardiac and urinary disorders.	The extract of the leaves is used to cure cardiac and urinary disorders.
Crataegus songarica	Reng kul	Rosaceae	Fruit	Hypertension	Fruits are eaten in case of hypertension.
Trifolium pretense	Bataknur	Fabaceae	Leaves	Irregular menses	Leaves are cooked and then eaten to restore irregular menses.
Linum unistatissimum	Alshi	Linaceae	Seed	Rheumatic pain	The oil extracted from the seeds is applied on the joints.
Platanus orientalis-kashmiriana	Boonye	Platanaceae	Bark	Diarrhoea and dysentery	The bark is grinded and mixed with vinegar and lemon and is used for the treatment of diarrhoea and dysentery.
Plantago lanceolata	Gul	Plantaginaceae	Leaves	Urinary disorders	Extract from the boiled leaves is used.

Fig. 2: Some ethnomedicinal plants of the study area (A) *Malva sylvestris* (B) *Acorus calamus* (C) *Achillea millifolium* (D) *Hyoscyamus niger*

A



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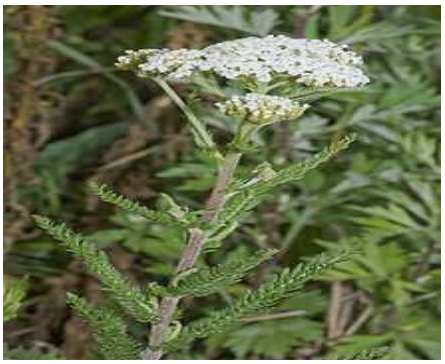

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Conclusion

Keeping in view the high cost and side effects of allopathic medicines, the use of the medicinal plants against different ailments plays a significant role in meeting the primary health care of the rural communities of Gulmarg and its allied areas. Gulmarg is fairly rich not only in medicinal plants but has also deeply rooted traditional of these medicinal plants among the people. An immensely valuable database could be the outcome of this knowledge which in turn can provide baseline information for the commercial exploitation of bio resources. This information could also be useful for the industry, pharmacologists, physicians, phytochemistry, botanists and alike interested in the development of the alternative therapies. But the traditional knowledge is draining off due to the urbanization. Thus the need of the hour is to speedily document this valuable information of ethnobotany.

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