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Economic and medicinal properties of some medicinal plants found in Kashmir Himalaya

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Abstract

Medicinal plants have been a source of succour in the control of many diseases in developing countries and sickle cell disease is no exception. Crude extracts from plants have been used in treating an array of diseases since ancient times although, the bioactive components of such plants remain largely unknown. Various advances in scientific research on the use of plants and herbs brought the beneficial aspects of traditional medicine and the rationale for their uses to the limelight. The medicinal properties of plant species have made an outstanding contribution in the origin and evolution of many traditional herbal therapies. These traditional knowledge systems have started to disappear with the passage of time due to scarcity of written documents and relatively low income in these traditions. The medicinal properties of various plants after having been ascertained in early times passed from generation to generation as trade secrets. Many plants found in Kashmir have the folklore as being used for the treatment of many diseases like diarrhea, inflammatory disorders, Cholera, skin diseases, rheumatism, diuretics (Increasing flow of urine), cough, asthma, snake-bites and anti-cancer.

Keywords: Kashmir valley, medicinal properties, crude extracts, diseases, anti-cancer, medicinal plants.

Introduction

The medicinal properties of plant species have made an outstanding contribution in the origin and evolution of many traditional herbal therapies. These traditional knowledge systems have started to disappear with the passage of time due to scarcity of written documents and relatively low income in these traditions. Over the past few years, however, the medicinal plants have regained a wide recognition due to an escalating faith in herbal medicine in view of its lesser side effects compared to allopathic medicine in addition the necessity of meeting the requirements of medicine for an increasing human population. Knowledge of their healing power was most likely gained through a process of trial and error and handed down over generations as an integral aspect of tribal tradition. Every plant contains a large number of different groups of chemical compounds, some of which have been observed to have healing effects. In the course of evolution, methods were discovered for processing medicinal plants and using their active compounds. The use of medicinal plants can be historically divided into at least three different but overlapping philosophies and forms of application. Forests have played key roles in the lives of people living in both mountains and lowland areas by supplying fresh water and oxygen as well as providing a diversity of valuable forest products for food and medicine. The age old traditional values attached with the various forest types and the varieties of forest products (i.e., medicinal plants) have gained tremendous importance in the present century. Plants play a leading role in the introduction of novel therapeutic agents, and also drugs from the higher plants carry on dwelling in an important position in modern medicine (Dev, 1997) ^[1]. Medicinal plants have been the subjects of man's interest since time immemorial and play a key role in human health (Constable, 1990) ^[2]. Medicinal plants have been identified and used throughout human history. Almost every civilization has a history of medicinal plant use (Ensminger *et al.*, 1983) ^[3]. Plants provided the oxygen, food, forage, shelter, and medicine needed for higher life forms. Overtime and with the beginning of societies, humans learned to recognize and categorize plant materials suited for use in meeting the necessities of life. The medicinal qualities of plants are of course due to chemicals. The presence of various compounds like flavonoids, polyphenolics, tannins and steroids have been implicated in a number of medicinal properties of the plants. Many of these phytochemicals have beneficial effects on long-term health when consumed by humans, and can be used to effectively treat human diseases. Plants are rich in a variety of secondary metabolites such as tannins, terpenoids, alkaloids, flavonoids, phenols, steroids, glycosides, and volatile oils (Cowan 1999) ^[4].

The Valley of Kashmir 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. Huien Tsang, who visited, "Kashmir yields saffron, lenses and medicinal Plants." Ayurvedic medicines have been in vogue in Kashmir since early times. Dridhabala an ancient physician of Kashmir is believed to have revised "Agnivesa Sambita" a monumental work on Ayurvedic system written by Kanishka's court physician Charaka. Near 570 plant species are reported to be of medicinal importance. Kashmir valley has a great potential for establishing pharmaceutical and essential oil industry based on these high value plant species. Prominent among the aroma bearing plants are Lavender, Rose, Clarysage, Peppermint, Rosemary, Artemisia annua, Atropa acuminata, Podophyllum hexandrum, *Dioscorea deltoidea*, Melissa officinalis, Tagetes minuta. And Geranium oils. Many plants found in Kashmir have the folklore as being used for the treatment of many diseases like diarrhea, inflammatory disorders, Cholera, skin diseases, rheumatism, diuretics (Increasing flow of urine), cough, asthma and snake-bites. Many of the plant materials used in traditional medicine are generally proved more effective and relatively cheaper than modern medicine (Mann *et al.*, 2008) [5]. against certain ailments like antibacterial, anticancerous, anti-inflammatory, rheumatoid diseases. Species of the genus *Rheum* have been reported to be rich in polyphenols components, such as anthraquinones, stilbenes, flavonols and anthocyanins (Koyama *et al.*, 2007) [6], which may have bioactive effects (Zhou & Yu, 2006) [7]. Rhubarb species have been used in traditional Chinese medicine for thousands of years and have been used in the treatment of gastrointestinal dysfunction, ulceration, inflammation, renal protection and as anti-microbial agents (Huang *et al.*, 2007) [8]. Kashmir valley has a great potential for establishing pharmaceutical and essential oil industry based on these high value plant species. Prominent among the aroma bearing plants are Lavender, Rose, Clarysage, Peppermint, Rosemary, Artemisia annua, Tagetes minuta and Geranium oils. The essential oils derived from these plants form the backbone of perfumery, cosmetic industry. These oils rank among the top ten essential oils used in aromatherapy throughout the world. Lavender Oil, Clarysage Oil, Rosemary (*Rosemarinus Officinalis* Linn), Artemisia Annua Oil, Marigold (*Tagetus minuta*), Peppermint (*Mentha piperita*) etc. Ayurvedic medicines have been in vogue in Kashmir since early times. Dridhabala an ancient physician of Kashmir is believed to have revised "Agnivesa Sambita" a monumental work on Ayurvedic system written by Kanishka's court physician Charaka. *Rheum species* is a perennial stout herb. Rhubarb is the English name of the genus *Rheum* (family polygonaceae). There are about 60 species of the genus *Rheum* recorded in the world (Agarwal *et al.* 2001) [9]. Rhubarb is a plant name for the many different species of *Rheum*, distributed in the temperate and sub-tropical regions of Himalaya from Kashmir to Sikkim (B. P. Nautiyal *et al.*, 2003) [10]. And growing in the wild in the mountains of the Western and North-western provinces of China and in the adjoining Tibetan territory and in cultivation in much of Europe and the United States. In Kashmir Himalaya ranges from an altitude of 1700m to 5500m. *Rheum* root has a purgative action for use in the treatment of constipation, and many other diseases and also has an astringent effect.

Materials and Methods

Surveys

Surveys were done for the collection of three species of medicinal plants from high altitudes of Kashmir Himalaya. *R. emodi* and some other medicinal plants were collected from various altitudes like Yousmarg, Dodhpathri, Thajiwas Glacier (Sonmarg), Affarwat (Gulmarg), Dagvan (Tarsar Marsar), Aaroo (Pahalgam), Laar and Dhara. *R. webbianum* including other medicinal plants were collected from Ladakh region i.e. Tangsti, Khardungla, Panzila Top (Zanskar), Tangole (Zanskar) and Parkachik (Zanskar). *R. spiciforme* and May other medicinal plants were collected from Gurez area i.e. Dawar Hills, Dahi Nala, Chakwali, Habbakhatoon Mountain and Tragbal. All the study sites are depicted in figure 1 and table 1. The specimens were identified by consulting the Flora of China (Shu *et al.* 2003) [12]. And Alpine Flora of Kashmir Himalaya (Dhar & Kachroo 1983) [11]. The information of medicinal plants for different medicinal purposes was collected by conducting frequent field surveys. In the study, area and plants were collected from diverse habitats. The surveys and collection of *Rheum* species was mainly on high altitudes and information was taken from gujjars, bakkerwals and some local people. For gaining knowledge and information of medicinal plants these people were interviewed during the course of present study. The information and knowledge of different medicinal plants found in Kashmir Himalaya was gained by interview of local people as shown in figure 2, the interview with local people in Ladakh region is shown in figure 3 and interview with tribal people in Gurez valley is shown in figure 4.



Fig 1: Red circles denotes the survey areas of Kashmir Himalaya.



Fig 2: Interview of local people during collection of *R. emodi* and other medicinal plants from different altitudes of Kashmir Himalaya.



Fig 3: Interview of local people when collection of *R. webbianum* and other medicinal plants from different altitudes of Ladakh and Zaskar region.



Fig 4: Interview of local people during collection of *R. spiciforme* and other medicinal plants from different altitudes of Gurez valley.

Table 1: Study sites with altitudes

| Sites / Altitudes(m)/ <i>R. emodi</i> and other medicinal plants | Sites/Altitudes(m) / <i>R. webbianum</i> and other medicinal plants | Sites/Altitudes (m)/ <i>R. spiciforme</i> and other medicinal plants |
|--|---|--|
| Gulmarg/ 4476.8 | Panzila Top/4593.8 | Satni mountain/ 3962.4 |
| Dhara/ 3751.6 | Tangole/4266.1 | Dawar hills /4419.6 |
| Pahalgam/ 3962.4 | Parkachik/3938.2 | Chakwali / 4684.8 |
| Sonamarg/3462.2 | Tangsti/4725.8 | Habbakhatoon Mountain /4756.8 |
| Yousmarg 4267.2 | Khardungla/4921.5 | Dahi Nala / 3810.0 |
| Dodhpathri/ 3862.4 | - | Tragbal / 3352.8 |
| TarsarMarsar/ 4657.2 | - | - |
| Laar/ 3657.6 | - | - |

Results

Different medicinal plants from Kashmir Himalaya was collected during surveys. All the medicinal plants are used by the local people, by gujjars and bakkerwals. These medicinal plants are their first aid and can cure any illness.

The medicinal properties of various herbs and flowers growing in Kashmir need to be publicized so that the local inhabitants particularly villages would not let these plants fall in waste due to lack of awareness. And there is need for saving this God gifted natural resource of Kashmir from smugglers and a wide programme needs to be launched by the government for their proper retrieval and sale which can become useful for the economy of Kashmir.

Rhubarb is stomachic, bitter, tonic, cathartic. Useful for simple diarrhea, but not in constipation or any affection in which a continuous aperient action is necessary; Its stimulating combined with its aperients properties render it valuable in atonics dyspepsia. Best used for the ailments of children and aged persons. Combined with ginger, it may be given in the form of pill in cases where the bowels are sluggish. Ordinary dose of the powder is from 5 to 20 grains. Rhubarb is one of the more powerful herbs used in Chinese medicine. It is excellent for draining damp heat, especially when there is accompanying constipation. It moves the blood and is good for blood stagnation associated with acute stabbing pain and bruises, for which it can be taken both internally as well as externally in a liniment. It's also useful for dysenteric conditions caused by damp heat with symptoms of bleeding in the stool. It can also be taken for vomiting of

blood. It can be used both internally and topically for infections. It kills blood flukes. As an external remedy for inflammatory skin conditions such as boils and bums, rhubarb powder can be used alone or combined with other herbs with a little flour and water or honey to hold it together. Its Powdered roots are sprinkled over ulcer for healing and also used for cleaning teeth. Leaf stalks are eaten either raw or boiled, sprinkled with salt and pepper. Leaves and flowers area also edible. Some of the famous medicinal plants with their uses and remedies are are listed in Table 2. The percentage of parts of plant e.g., roots, rhizomes, stem, seeds, leaves etc., used by tribal people, bakkarwals, gujjars and some local people are shown in figure 5.

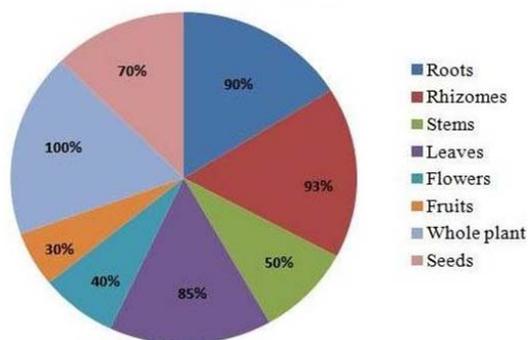


Fig 5: Percentage of plant parts used by tribal and local people in Kashmir Himalaya.

Table 2: Medicinal properties of some medicinal plants found in Kashmir Himalaya

| Rheum species | Diseases | Part used | Preparation |
|---|---------------------------|-----------|---|
| <i>R. emodi</i> (Pumbhaak, Pumbchaalan) | | | |
| 1 | Wounds and boils. | Roots | Root is powdered in the form of paste and applied on wounds directly without massage. |
| 2 | Jaundice | Leaves | Leaves are boiled in water with a pinch of salt and taken a cup orally twice a day. |
| 3 | Diahorrea/ Indigestion | Roots | 50g Root is powdered and boiled in 500 ml water and taken a cup thrice a day. |
| 4 | Cough and asthma | Leaves | Leaves are crushed and boiled in water and then taken half cup orally thrice a day. |
| 5 | Headache | Leaves | Leaves are crushed and boiled and then taken one cup twice a day. |
| 6 | Muscular pain / Body ache | Roots | The root is grinded into powdered form and mixed with some oil and then applied |

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| | | | externally on affected parts. |
| 7 | Freckle / Skin eruptions/Skin diseases | Roots | Root is crushed and grinded and mixed with vinegar and then that paste is applied externally on affected parts. Powder of root is applied with fresh milk also. |
| 8 | Swelling and Inflammation/Rheumatic pain | Leaves/Roots | Fresh leaves and fresh roots are grinded and the oil like substance came out from fresh roots and leaves and that oil is applied on affected parts. |
| 9 | Food | Leaves/ Stalks | Leaves and its stalks are cooked as a vegetable. |
| 10 | Constipation | Root | 50 g root powder is mixed with 10g ginger powder and then mixed with 200ml of water and then boiled, then taken half cup four times a day. |
| 11 | Reducing obesity, weight/ fat | Root | 10 g root and 3 g ginger is grinded paste is made. Boil the mixture in one 300ml of water and then taken two spoons morning and evening. |
| <i>R. webbianum</i> (Revandchini, Lachoo) | | | |
| 1 | Rheumatic pain/Wound | Roots | The root powder is made into fine paste and used on affected parts. |
| 2 | Piles | Leaves | Leaves are crushed and boiled with water and taken orally thrice a day. |
| 3 | Chronic bronchitis | Leaves | Leaves are boiled and then the boiled water is taken thrice a day. |
| 4 | Constipation | Roots | Roots are grinded and fine powder is made and then mixed with water and then the tea spoon are taken thrice a day. |
| <i>R. spiciforme</i> (Pumbhaak, Jarochotal) | | | |
| 1 | Wound/swelling/ | Roots | The powder form of roots is mixed with warm water for making fine paste and then applied on swellings and wounds. |
| 2 | Bone fracture/Backache/ Joint pain | Roots | The powdered form of roots are mixed with water and one spoon of turmeric, making fine paste and then applied on affected parts and two spoons taken orally our times a day. |
| 3 | Food | Leaves | Leaves are cooked as a vegetable. |
| 4 | Rheumatic pain | Roots | The root is powdered into fine paste and used against rheumatic pain and wounds. The 3-5 g powder once in a week with milk. The paste is applied on affected portion externally. |
| 5 | Stomachache/ Intestinal infections/Dysentery | Roots | Tribal people chew roots for any stomach problem. Root powder is mixed with warm water and taken orally half cup twice a day for irritation in stomach, dysentery and intestinal infections. |
| Other medicinal Plants (local names)/family | | | |
| 6 | <i>Podophyllum hexandrum</i> Royle (wanvangun)/ <i>Berberis vulgaris</i> | Leaves and Roots | Its roots are crushed and taken with two times a day with milk, morning and evening for Constipation Diarrhoea, Gynecological disorders, Hepatic stimulant, Liver ailments, Menstrual disorder, Purgativ, Tumour, Acidity, Constipation, Diarrhoea. Eczema, Hepatic disease, Liver ailments. Its leaves are also taken orally with boiled water two times a day. Its paste is also used as paste for skin diseases and boils. |
| 7 | <i>Achillea millefolium</i> (pahalgam)/ <i>Asteraceae</i> | Leaves | Its leaves are crushes and boiled with water and taken three times in a day within a cup for Astringent, Bladder/urine tract burning sensation, Cold, Eyes inflammation, Fever, Gum problem inflammation, Headache, Kidney pain, Laxative, Liver troubles, Toothache, Urinary problem. |
| 8 | <i>Artemisia absinthium</i> (tethvan)/ <i>Asteraceae</i> | Leaves and Roots | Its leaves are boiled with water and then the water is taken in the evening for Astringent, Bile, Cold, worms problem, Headache, Laxative, Liver troubles, Stimulant, Tonic, Urinary problem Fever, Headache, Kidney pain, Stomachache. Its roots are chewed for toothache and gum problem. |
| 9 | <i>Saussurea costus</i> , <i>Saussurea lappa</i> (kuth)/ <i>Asteraceae</i> | Roots | Its roots are crushed and take with boiled water two times a day. Its roots are also chewed. Its roots are useful for Anthelmintic, Arthritis, Asthma, Bronchitis, Cardiac stimulant, Cholera, Cold, Cough, Dysentery, Fever, Headache, Heart problems, Hysteria, Insect bite, Joint pain, Joint swelling, Kidneys ton, Menstrual irregularities, Rheumatism, scabies, Skin diseases, Stomach pain, Stomachic, Tonic, Toothache, Wounds. Its roots are kept in clothes for protection from insects like silver fish and moths. |
| 10 | <i>Arnebia benthamii</i> (kah zaban)/ <i>Boraginaceae</i> | Roots, Leaves, Rhizomes and flowers | Its roots and rhizomes are crushed and taken with boiled water or boiled milk takern in the evening and in morning for fever, Blood purifier, Cold, Cough, Chest infection Lung infection, Hair dye, Hair fall, Headache, Pneumonia Throat diseases, Tongue disease, Backache. Its leaves and flowers are also crushed and taken two times a day with water or milk for Blood purification, Chest and lung infection, Fever, Headache, Heart diseases, Jaundice. |
| 11 | <i>Fagopyrum</i> (traumb)/ <i>Polygonaceae</i> | Roots and seeds | Its roots and seeds are crushed and taken with warm water twice a day for Painful urination, Abdominal ailments, and Colic complaints. |
| 12 | <i>Colchicum luteum</i> (virkum)/ <i>Colchicaceae</i> | Buds | Its buds are crushed and taken with boiled water thrice a day for Cough, Dandruff, Fever, Gout, Gynecological disorders, Liver ailments, Rheumatism, Skin diseases and Spleen disorders. |
| 13 | <i>Pyrethrum pyrethroids</i> (Serpan)/ <i>Asteraceae</i> | Leaves, Flowers | Its leaves are crushed and boiled in water and then that boiled water, one cup is taken at night for Astringent, Vulnerary troubles. Its flowers are also crushed and spoon of that crushed flower is taken directly two times a day for fever. |
| 14 | <i>Viola odorata</i> (bunafsha)/ <i>Violaceae</i> | Flower, Leaves, whole plants | Its flowers are crushed and taken orally two times a day for Bronchitis, Chest congestion, Cold, Cough, Fever, Headache, Lung diseases, Muscular pain, Purgative, Respiratory infections, Sore throat, Swelling, Throat infection. Its leaves are also boiled and taken a glass of that once a day for toothache, Cold, Cough, throat ache and its roots are also crushed and taken that boiled water twice a day for Cough, Diuretic, Fever, Laxative, Purgative, Tonic, Headache, Asthma, |

| | | | Bronchitis, and Jaundice. |
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| 15 | <i>Artemisia absinthium</i> (tethvan)/ <i>Asteraceae</i> | Flowers and leaves | Its leaves are boiled and hair washed with that boiled water for Dandruff. Its leaves are boiled and then that boiled water is taken twice a day for Fever, Stomach pain, Tonic Worm intestinal, Abdominal pain, Joint pain, Roundworm, and Worms. |
| 16 | <i>Datura stramonium</i> (datur) <i>Solanaceae</i> | Oils, Leaves, Seeds, Stem stalks and whole plant | Its seeds are crushed and oil is obtained which act as an ointment for Boils, Headache, Skin disease, Dandruff, Antiseptic, and Antispasmodic. Its leaves are crushed and boiled and taken with water for the remedy of Asthma, Bronchitis, Cough, Headache, Joint pain, Rheumatism, and Tonic. Its stem and stalk are chewed for toothache, Aphrodisiac, Intestinal worms, Respiratory disorder. |
| 17 | <i>Adiantum capillus</i> (gatherer)/ <i>Pteridaceae</i> | Fronde, Rhizomes, stalks and whole plants | Its fronds are crushed and boiled and then taken thrice a day with small cup for bladder stone, Chest infections, Chest pain, Fever ⁴⁷ , Headache, Jaundice, Kidney stone Nasal catarrh, Respiratory problem, Swelling, Tumour, Urinary problem, its rhizomes are crushed and mixed with tureic and applied on wound and eczema, and taken with water for Bronchial disorder, Cough, Piles, Stomach pain, Tonic its stalks are used for making Toothsticks. |
| 18 | <i>Saussurea stoliczkae</i> (jogibadshah)/ <i>Asteraceae</i> | Flower, leaves and whole plant. | Its leaves and flowers even whole plant is boiled and taken with water twice a day especially before break fat one glass for Asthma, Astringent, Gynecological disorders, Stimulant, Tonic, Toothache, Headache and Fever. |
| 19 | <i>Taraxacum campyloides</i> (hund)/ <i>Asteraceae</i> | Leaves, roots, whole plant. | Its roots are crushed and boiled in water and taken taken twice a day for abdominal pain. Blood diseases, Blood purifier, Chest infection, Cold, Dyspepsia, Fever, Gastro-intestinal troubles, Headache, Indigestion, Intestinal worms, Jaundice, Kidney complaints, Laxative, Liver ailments, Rheumatism, Skin diseases, Stomach disorders, Tonic, Worms, Its whole plant is used for purpose of Abdominal swelling, Acidity, Asthma, Cough, Fever., Burning sensation of urine, Regulates urine discharge, Its leaves and flowers are crushed and then cooked as a vegetable which is useful for Fever, warts, anemia. |
| 20 | <i>Nymphaea nouchali</i> Burm (bumposh)/ <i>Nymphaeaceae</i> | Leaves, roots, flowers, seeds, whole plant | Its seeds and flowers are crushed and taken two spoons twice a day for Whooping cough, Stomach problems, Its flowers and leaves after crushing is also used on Boils, Its rhizome after crushing is taken with warm water for Diarrhoea and the whole plant is useful for Anthelmintic. |
| 21 | <i>Fumaria indica</i> (shahtaar)/ <i>Papaveraceae</i> | Shoots and whole plants | Its shoots are crushed and boiled with water and then taken one glass once a day for Diarrhoea. The whole plant is crushed and boiled and taken twice a day within a cup for Asthma, Blood purifier, Breathing problem, Digestive ailments, Dyspepsia, Fever, Jaundice, Liver ailments, Liver tonic, Nausea, Skin diseases, Skin rashes, Vomiting. |
| 22 | <i>Descurainia sophia</i> (chari lachij)/ <i>Brassicaceae</i> | Leaves and seeds | Its leaves are crushed and boiled with water and taken twice a day within a cup for Fever. Its seeds are crushed and then the oil obtained are mixed with boiled water and taken two spoons twice a day for Bronchitis, Chickenpox, Dysentery, Gastric disorders, Intestinal disorder, Measles, Stomachache, Tonic. |
| 23 | <i>Acorus calamus</i> (vai)/ <i>Acoraceae</i> | Leaf and rhizome | Its leaves are crushed and applied on Wounds, its leaves are also boiled and then taken once a day for Worms. its Rhizomes are crushed and taken with warm water twice a day for Abdominal pain, Acidity, Anthelmintic, Antiallergic, Asthma, Bronchitis, Chest congestion, Cold, Cough, Diarrhoea, Dyspepsia, Fever ⁵⁸ , Lung diseases, Rheumatism, Stomach ailments, Tonic, Toothache and Intestinal worms. |
| 24 | <i>Berberis aristata</i> (kaudach)/ <i>Berberidaceae</i> | Roots and buds | Its roots and buds are crushed and mixed with turmeric and then applied for Backache, Eye ailments, Fracture, Joint pain. Its also taken orally two spoons a day for Jaundice and Malarial fever. |
| 25 | <i>Hyoscyamus niger</i> (bazarbangh) / <i>Solanaceae</i> | Flowers and leaves | Its flowers and leaves are boiled in water and taken one cup of it once a day for Asthma, Nervousness, Whooping cough. |
| 26 | <i>Urtica dioica</i> (soi)/ <i>Urticaceae</i> | Leaves | Its leaves are crushed and then applied once a day for Anthelmintic, Blood purifier, Boils, Dandruff, Rheumatism, Skin infections, Wounds. |
| 27 | <i>Viburnum cotinifolium</i> (kulmosh)/ <i>Adoxaceae</i> | fruits and aerial parts | Its fruits and aerial parts are crushed and applied on wounds and also taken orally two times a day within spoon for Kwashiorkor, Marasmus, and used as Laxative. |
| 28 | <i>Rumex nepalensis</i> Spreng. (abuj)/ <i>Polygonaceae</i> | Leaf, root and whole plants | Its leaves are cooked as a vegetable as it's good for health and also beneficial for Cuts, Skin eruptions, Wounds, Constipation, Cough, Dislocated joints, Skin diseases and Skin sores. |
| 29 | <i>Barleria cristata</i> (brenkad)/ <i>Acanthaceae</i> | Leaves and roots | Its leaves and roots are crushed and boiled and then that boiled water is taken one cup twice a day for Cough, Snakebite, Anemia, Whooping, Asthma and its roots and leaves are also chewed for toothache. |
| 30 | <i>Valeriana hardwickii</i> (mushakbala)/ <i>Caprifoliaceae</i> | Roots | Its roots are crushed and boiled and taken a glass once a day for Antispasmodic, Carminative, Hysteria, Stimulant. |
| 31 | <i>Dipsacus inermis</i> (vopal haak)/ <i>Caprifoliaceae</i> | Leaves | Its leaves are cooked and used as vegetable as it is beneficial for Cough, Swelling, Body ache, Sore throat. |
| 32 | <i>Malva neglecta</i> (sochal)/ <i>Malvaceae</i> | Leaves | Its leaves are cooked as a vegetable as it is useful for Appetizer, Constipation, Cough, Laxative, Stomach cramps, Ulcers, Wounds. |
| 33 | <i>Canabis sativa</i> (bhanga)/ <i>Cannabaceae</i> | Flowers and leaves | Its flowers and leaves are crushed and taken as Narcotic. Its leaves and flowers and leaves are boiled and taken a cup of it once a day for reedy of Anthelmintic, Appetizer, Arthritis, Blood purifier, Cholera, Dandruff, Diarrhoea, Gastroenteritis Piles, Rheumatism, Skin diseases, Urinary infection and Wormicide. |
| 34 | <i>Aconitum heterophyllum</i> (patrees)/ <i>Ranunculaceae</i> | Roots | Its roots are boiled in water and then that boiled water glass is taken once a day for Abdominal ailments, Cough, Diabetes, Diarrhoea, Dysentery, Dyspepsia, |

| | | | |
|----|---|-----------------------------|--|
| | | | Fever, Gastric disorders, Headache, Intestinal inflammation, Intestinal worms, Joint pain, Malarial fever, Piles, Skin problems, Spleen enlargement, Stomach ailments, Stomachache, Throat infection, Tonic, Toothache, Urinary infection, and Vomiting. |
| 35 | <i>Celtis australis</i> (brimij)/ <i>Cannabaceae</i> | Flowers and seeds | Its seeds and flowers are crushed and the oil obtained are o mixed with water and two spoons twice a day for Amenorrhoea, Colic complaints and Rheumatism. |
| 36 | <i>Origanum vulgare</i> (tul)/ <i>Lamiaceae</i> | Fruit | Its fruits are taken directly and is beneficial for Diarrhoea, Rheumatism, Tonic and Toothache. |
| 37 | <i>Acacia nilotica</i> (keekar)/ <i>Fabaceae</i> | Leaves, roots, gum and pods | Its leaves, flowers and pods are crushed and boiled and the one cup of that boiled water is taken once a week for Dysentery, Diarrhoea, Tonic, Sore throat and Urinogenital disorder. Its gum is mixed with warm water and taken two spoons once a day for Asthma. The paste of its roots are mixed with turmeric and used on Itching and Wounds. |
| 38 | <i>Taxus wallichiana</i> (barmi)/ <i>Taxaceae</i> | Fruit and leaf | Its fruits are taken directly as they are beneficial for Antiseptic and Sedative. Its leaves are boiled and the boiled water is taken in a cup twice a day for Asthma, Bronchitis, Cough and Indigestion. |
| 39 | <i>Cinnamomum tamala</i> (tejpattar)/ <i>Lauraceae</i> | Leaf | Its leaves are crushed and boil and one cup of that boiled water is taken once a week for Carminative and Rheumatic pain. |
| 40 | <i>Prunella vulgari</i> (kalvuth)/ <i>Lamiaceae</i> | Leaves and fruits | Its leaves are cooked and taken as vegetable as it is beneficial for stomach. Its leaves are crushed and applies on wounds and boiled with water ad taken for stomach and intestinal infections. |
| 41 | <i>Ocimum basilicum</i> (babire baeol)/ <i>Lamiaceae</i> | seeds and leaves | Its leaves are boiled and a cup of boiled water is taken twice a day in a cup for Fever, Hair fall, Headache, Stomachache, Vomiting and its seeds are also so ked for one hour, the seeds swells in the water and then milk and sugar is mixed with that water having seed as it is beneficial for Anthelmintic, Constipation, Cooling effect, Fatigue, Fever, Kidney stone and Urinary problem. |
| 42 | <i>Bergenia pacumbis</i> (patharchuri)/ <i>Saxifragaceae</i> | Leaves and roots | Its leaves are boiled and the cup of the boiled water is taken twice a day for remedy of wounds, Intestinal complaints, Stomach ulcers. Its roots are also crushed and boiled and the cup of that boiled water is taken twice a day for Acidity, Cough, Dysentery, Fever, Kidney stone, Diarrhoea, Headache, Internal injuries, and Intestinal complaints. |

Discussion

The medicinal plants are used by tribal people, local people who live on hilly areas and on high altitudes. They consume the medicinal plants for their daily lives. There are many medicinal plants whose leaves are used as vegetables and they dry the roots of these plants for different purposes, e.g. wounds, boils, scars, intestinal infection and digestion problems.

Conclusion

Plants play an important and vital role in our daily lives. All living creatures are directly and indirectly dependent on plants. The plants are micro-biosynthetic factories for a variety of compounds which are their secondary metabolites. The medicinal properties are attributed to specific combination of bioactive phytochemicals. The medicinal plants are being used by human being since time immemorial and we get reference to these in ancient literature. As per WHO estimates, about 80% world population still relies on traditional system of medicine. Plant based drugs are preferred over synthetic ones because these are cheap, with less side effects and biocompatibilities with the human bodies. Due to recent resurgence in interest in plant-based drugs, their demand has increased manifold. Further, most of these plants are collected from the wild source in unplanned and unscientific way with destructive harvesting without following for sustainable supply. Information regarding local uses of medicinal plants was collected by interacting with local and tribal people. Different parts of all the medicinal plants are being used by local people to control many diseases like, piles, constipation, skin eruptions, intestinal infection, wounds, joint pains and also used as food.

Ethno-botanical information when coupled with modern phytochemical methods can result to produce drugs for more uses.

Author's contributions

All authors equally participated in designing experiments analysis and interpretation of data. All authors read and approved the final manuscript.

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