



Asian Journal of Plant Sciences

ISSN 1682-3974

science
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Ethnobotany of Medicinal Plants from Tian Mu Shan Biosphere Reserve, Zhejiang-Province, China

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Abstract: This study comprises of results of an ethnobotanical survey of Tian Mu Shan Biosphere Reserve ethnic region of Zhejiang Province, China, conducted in year 2005. Various folklore recipes of sixty seven medicinal plants of thirty six families of the area were recorded and their ethnopharmacological aspects were discussed. The most common families were Ranunculaceae 13.43%, Rosaceae 7.46% and Poaceae 5.97% and most frequent plant parts used are; roots 34%, leaf 26% and whole plant 18%. This survey reveals that these traditional medicines, being major source of treatment of different diseases still hold great importance in lives of various ethnic groups of the area. It will be appropriate to document these herbal medicinal folklore informations as this survey can prove to be an invaluable guide in present day screening of new drugs and incentive clue for phytochemical and pharmacological analysis and it can enhance the conservation of plant biodiversity of the area as well.

Key words: Tian Mu Shan, Zhejiang, ethnobotany, traditional Chinese medicines, biosphere reserve, biodiversity

INTRODUCTION

Since time immemorial man had been using various natural materials as a source of medicines. The value of medicinal plants to human livelihoods is essentially infinite. They obviously make fundamental contributions to human health. Popular knowledge of plants used by humans is based on thousands of years experience. By trial and error, people learnt how to recognize and use plants, including those with a magic-religious function and this ethnomedicinal knowledge transmitted from generation to generation (Lev and Amar, 2000). But this knowledge and transmission is in danger because transmission between older and younger generation is not always assured (Anyinam, 1995). Also interest in ethnobotany has increased dramatically in recent years. Medicinal folklore over the years has proved to be an invaluable guide in present day screening of drugs. In recent years, use of ethnobotanical information in medicinal plant research has gained considerable attention in segments of the scientific community (Heinrich, 2000).

Plants that are used for traditional herbal medicine in different countries are an important part of these studies. In general, experiences gained from ethnobotanical

approaches of traditional medicinal studies in China and Himalayan countries have helped drug production and new drug development. However, in some countries in recent years, ethnobotanical studies have been used for the discovery of new drugs and new drug development. China has rich culture and long history of traditions and use of traditional medicines of plants and other sources, for thousand of years. It is estimated that 70-80% of people worldwide rely chiefly on traditional, largely herbal; medicine to meet their primary healthcare needs (Farnsworth and Soejarto, 1991; Pei Shengji, 2001). Traditional systems of medicine in China, may be classified into 3 broad categories: (1) Traditional Medical Systems, with written traditions of documentation of knowledge, pharmacopoeias for doctors and institutions for training doctors; (2) Traditional Medical Knowledge (Folk Medicine), which is orally transmitted and associated with households, communities or ethnic groups and (3) Shamanistic Medicine, with a strong spiritual element and which can only be applied by specialist practitioners. Traditional Medical Systems more widely familiar are Chinese Traditional Medicine, Tibetan Medicine, Ayurveda, Siddha, Unani and Western Herbal Medicine, the latter being rather ill-defined. The great majority of species of medicinal plants are used only in

Folk Medicine. Traditional Medical Systems employ relatively few: 500-600 commonly in Traditional Chinese Medicine (but 6000 overall) (Pei Shengji, 2001); 1430 in Mongolian Medicine (Pei Shengji, 2002b); 1106-3600 in Tibetan Medicine (Pei Shengji, 2001, 2002b); 1250-1400 in Ayurveda (Dev, 1999); 342 in Unani and 328 in Siddha (Shiva, 1996). Some researchers have collected traditional ethnopharmacopeia and medicinal usages of Chinese herbal medicines, which in some way had assisted in new drug development. This ethnobotanical field survey will also be a step ahead towards the direction in field of pharmacology. Some ethnobotanical work being conducted in China (Bai, 1990; Chen, 1998; Dai and Li, 1995; Dai and Qiu, 1997; Huang, 1992; Luo, 1987; Li, 1994; Mo, 1991; Pei and Long, 1998; Xu *et al.*, 1989; Zeng, 1984; Li *et al.*, 1996; Huai, 2000; Huai *et al.*, 2000a). As medicinal plants are providing a significant source of income for rural people in the area, especially through the sale of wild-harvested material, herbal medicines. The collectors are often herders, shepherds or other economically marginalised sections of the population, such as poor landless people and women. There is also the question of how best to develop traditional systems to meet modern challenges. The environment in which traditional medical practitioners are operating today is not the same as in the past (Craig, 2002). So to collect the ethnomedicinal and ethnopharmacological informations, new and rare medicinal uses of plants of Chinese traditional herbs, this ethnobotanical exploration was made in the TMSBR. But as far as we know, no ethnobotanical study has been yet performed to collect the ethno-medico herbal data from TMSBR study area. This study deals with the first part of research, mainly comprising of uses of herbs by local mandarin ethnic groups. The aims of this study are:

- Collection of all possible folklore informations about traditional herbs being used in their daily life.
- Assessment of uses of micro-flora of the area.
- The assessment of most frequently used medicinal plants and their most common usages.
- Assessment of biotic pressure on flora.
- Sustainable collection of medicinal herbs.

Study area and ethnic groups: Tian Mu Shan Biosphere Reserve is located 30.19°-30.25°N, 119.23°-119.29°E between the Yellow mountain and east China, at an altitude of 300-1506 m above sea level, in Zhejiang province. TMSBR area was listed as one the earliest forest forbidden felling in China in 1956. It was protected as a national nature reserve in 1986 and in 1996; it was approved as an international Biosphere Reserve in UNESCO's Man and Biosphere Programme. TMSBR has 15 villages and covers an area of ca. 42.84 km². The

biosphere represents the tropical monsoon climate with annual rain fall ca. 1390-1879 mm, with 159.2-183.1 rainy days and 10-30 snowing days. The av. temperature of area is 14.8-8.8°C, while minimum and maximum temperature is -13.1°C and 38.2°C respectively. TMSBR is famous for its splendid, rare and wonderful evergreen trees, which provide beautiful scene. TMSBR is also known as, 'the kingdom of giant trees', 'a clean cool world' and 'a green jewel on Yangtse River's Gold Delta.

The population of various ethnic groups in the TMSBR area is ca. 12650 and communities inhabit in scattered zones. The residents of Baojia village and Dongguan village out of total fifteen villages live within TMSBR region. The villagers traditionally live on planting and processing economic crops, such as bamboo shoots, tea, Qingdao beans and other local products. Their main source of income is agriculture, forest products and selling of medicinal herbs. So this area is core potential source of livelihood, food, fodder, fuels and medicaments for native communities.

MATERIALS AND METHODS

This ethnobotanical expedition was conducted during year 2005. The ethnomedicinal informations about their traditional herbal knowledge were collected from 62 interviewees (30 traditional herbal practitioners, 7 village heads, 20 women and 5 forest workers) in 15 villages. Most of interviewees (50) were more than 55 years old, belonging to the families which still have a strong connection with traditional agriculture and herbs collecting and selling for their day-to-day needs and necessities. The data were obtained through direct interviews using a selected and random interview methodology, following classical indications in the ethnopharmacological research proposed by Waller (1993). The collected plant specimens were properly identified by comparison with the specimens of Herbarium of Zhejiang University, Hangzhou, China.

RESULTS

Ethnobotany, as a prospering research field of science, has been widely used for the documentation of indigenous knowledge on the use of plants and for providing an inventory of useful plants from local flora. The data obtained were arranged in alphabetical synopsis of family of the plant. The common names are given in local language for each species. The botanical name, accession number and medicinal uses are given to each species. The medicinal uses include plant parts used, methods of preparation and administration. This exploration documented the TCM knowledge of study

area. The herbal medicine healers are mostly, older men and women and they earned good respect in the society. Generally, the patients are examined in morning and evening. The day time is assigned for other activities as collection of herbs, farming, construction and caring for domestication animals etc. The patients pay fee in shape of goods, vegetables, chicken, beer and other domestic animals and its quantity varies depending on economic status of patient. So it is very convenient and affordable for every patient, besides they traditional belief in TCM ailment system.

This study mentioned sixty seven species of plants used to treat various types of diseases, by local healers. The treatment of various diseases as fever, liver, lung, flu, cough, kidney pain, diabetes, typhoid, stomach problems, tuberculosis, enlarged spleen, menstrual disorders, penis irritation and cardiac problems is carried out primarily by oral administration, while for ailments like boils, bruises, tumors and acne plant material is applied externally on affected part and whereas in epilepsy, leprosy and snake bite, jaundice, allergy both oral and ectodermic application of herbal medicines is common. Different plant parts are used in various forms of powder, paste, juice, decoction, extraction and tea. The catalogue embodies informations is arranged in alphabetically by family names, scientific name, local names, voucher specimens and mode of usage.

Amaranthaceae (Xian ke)

Achyranthus bidentata Bl. (Niu xi) TMS 22: Its leaves are cooked and eaten as vegetable and roots decoction is used as ethnomedicine for activating blood, relieving inflammation, enrich liver, relieve kidney stone pain, anti tumor and strengthen bones and muscles.

Apiaceae (San xing ke)

Bupleurum chinensis D.C. (Bei cai hu) TMS, 55: Root and leaf decoction is used as cure of flu, fever, cold and cough.

Angelica biserrata (Shan et Yuan) Yuan et. Shan (Dang gui) TMS 36: The plant root is powdered and taken with extract of rose to be efficient activator of blood and it also relieves from constipation.

Changium smyrnioides Wolff. (Dang shen) TMS 38: The extract of plant is used to improve functioning of liver, spleen and lungs, it also improves blood production.

Araliaceae (Wu jia ke)

Acathopanax garacilistylus W.W. Smith. (Wu jia) TMS, 56: It root decoction is mixed with wine and taken to make body powerful and vigorous.

Aquifoliaceae (Dong qing ke)

Ilex chinensis Sims (*I. purpurea* Hassk.) (Dong qiang)

TMS, 43: Its leaves are crushed and applied to burnt parts of body and it removes heat of burnt place very quickly and enhance coolness, soothing and rapid healing of wounds.

Araceae (Tian nan xing ke)

Pinellia ternata (Thunb.) Briet. (Ban xia) TMS 33: Its leaves and flowers with some parts of *Magnolia officinalis* and *Zingiber officinale* are considered to be effective against depressant effects and it is also used to treat seasonal flu, cold and cough, as an extract in tea form in winter.

Acorus tatarinowii Schott. (Shi chang pu) TMS 58: Its seeds are crushed with seeds of papaver (*Papaver somniferum* L.) and taken with hot milk to invigorate brain and to improve intelligence.

Arisaema heterophyllum Bl. (Tian nan xing) TMS 59: Root decoction gives relief of dampness, dissolve phlegm, pain and it also diminishes inflammation.

Aristolochiaceae (Ma duo ling ke)

Aristolochia sieboldii Miq. (Xi xing) TMS, 210: Its juice of leaves is used as to cure headache and toothache.

Asteraceae (Ju ke)

Artemisia caruifolia Buch. Ham. (Qing hao) TMS, 76: Its root decoction of root is used as anti malarial remedy.

Artemisia scoparia Waldet Kit. (Zhu mao hao) TMS 82: Its root infusion is taken to cure hyperacid stomach, high sugar level and to lower high blood pressure. Its decoction of leaves is used as against phlegm and typhoid. Its flowers are boiled and used as anti-jaundice, in folklore recipes.

Artemisia stolonifera (Maxim.) Kom. (Bai lian hao) TMS 83: Its aerial parts are used in form of juice to treat rheumatism. While its root decoction is considered effective against epilepsy and leprosy.

Taraxacum mongolicum (Pu gong ying) TMS 86: Its root infusion is orally taken in treatment of phlebitis, diabetes, tuberculosis and malaria. Its aerial parts are crushed in water to take bath for curing acne, scarlet, fever, measles and herpes simplex. Flowers are used as tea; it is used in treating breast cancer, chronic hepatitis and diabetes and other disorders of breast as poor milk flow.

***Xanthium sibiricum* Ptrin.ex. Widder. (Cang er)TMS 88:**

Its leaf extract is used to cure hepatitis and gastric problems. while root decoction is used for bath to relieve of fever and hypertension.

Campanulaceae (Ju geng ke)

***Adenophora stricta* Miq. (*A. hunanensis* Nannf. ssp. *Huadungensis* Hong. (Sha sheng) TMS 88:** Its root extract is good against lung problems as asthma and to cure whooping cough. Its seeds decoction is good expectorant and it cures chronic bronchitis.

Caprifoliaceae (Ren dong ke)

***Lonicera maackii* (Rupr.) Maxim.(Jing ying ren dong) TMS, 45:** Its root decoction is effective against inflammation due to germs and is used as antiviral for viral infections.

Caryophyllaceae (Shi zu ke)

***Dianthus superbus* L. (Qu mai) TMS 23:** Its extract of whole plant is used to promote urination and activate blood flow in blocked vessels. Its roots decoction is taken orally as anti tumor ailment.

Commelinaceae (Ya tuo ke)

***Commelina bengalensis* L. (Huo cai tou) TMS 09:** Extract of whole plant is used to cure constipation and remove intestinal parasites.

Curcubitaceae (Hu lu ke)

***Momordica charantia* L. (Ku gua) TMS 79:** Its leaf extract is used to cure diabetes. While it's powdered seeds are effective as anthelmintics, used on daily basis.

Eriocaulaceae (Gu jing cao)

***Eriocaulon buergerianum* Koern. (Guo jing cao)TMS 61:** Leaf decoction is used as reliever of liver heat and rheumatic pains, its root infusion is effective to improve eye sight.

Eucomiaceae (Du Zhong)

***Eucommia ulmoides* Olive. (Du zhong) TMS, 88:** Its seeds and roots decoctions are used to make back bone and knee joints strong and remove pain from these joints. Its leaf extract is used as suppression of tumors.

Euphorbiaceae (Da ji ke)

***Euphorbia pekinensis* Rupr. (Da ji) TMS 34:** The whole plant is used as vegetable and considered as laxative and it relieves inflammation of stomach and intestines.

Fabaceae (Dou ke)

***Sophora flavescens* Ait. (Ku shen) TMS 32:** Decoction of root is used as cleansing of stomach heat and as anthelmintic also.

Gentianeae (Long dan ke)

***Gentiana scabra* Bunge. (Long dan) TMS 41:** Decoction of whole plant is used to treat internal heat and it is used to cure headache and dizziness. Its extract of root is used as intestinal worm repeller.

Lamiaceae (Chun xing ke)

***Lycopus lucidus* Turcz. var. *hirtus* Regel. (Dan shen)TMS 111:** Extract of whole plant is used as lowering of high blood pressure. It provides strength to heart muscles and regulates cardiac impulse rate. Its root decoction is good tonic against anti allergy used by local ethnic people. Leaf paste is applied to wounds to stop bleeding.

***Salvia multiorrhiza* Bunge (Dan shen) TMS 44:** Root and leaves decoction is used as activating blood and it provides soothing and comfortness to brain nerves. It is used in indigestion and liver disorders by boiling it in water and taken orally.

***Lycium chinense* Mill (Guo qi) TMS 45:** The plant extract is considered to be effective as strengthening of liver, kidney and it enriches blood and more important is that it improves eyesight.

Liliaceae (Bai he ke)

***Allium macrostemon* Bunge. (Tu fu ling)TMS 66:** Its root decoction is used against heat of stomach and cure intestine pain.

***Allium cepa* L. (Yang cun) TMS 100:** Bulb scales are raw eaten with Ghee (Oil) for snake bite treatment and juice of bulb is used to cure pain of scorpion sting by rubbing on infected part of body. It is also used with whole plant extract of *Clematis huchouensis* Tamura as antitumor.

Luaraceae (Zhang ke)

***Lindera aggregata* (Sims.) Kosterm. (Wu yao) TMS, 67:** Whole plant is used to cure rheumatism and backbone pain due to injury and old age.

Magnoliaceae (Mu lan ke)

***Magnolia officinale* Rhed. et. Wils. ssp. *biloba* (Rhed. et. Wils) Law. (Chou pu)TMS 25:** Its root extraction is used expelling damp, anti asthma and to promote flow of Qi in body.

Schisandra elongate (Bl.) Baill. (*S. sphenanthera* Rhed. et. Wils. ; *S. viridis* A. C. Smith.) (Wu Wei zi) TMS 26: The plant tang (extract) of leaves and roots is used to cure cough, diarrhoea and it provide relief to mind.

Kadsura japonica (L.) Dunal (*Kadsura longipedunculata* Finet et Gagn.) (Nan wu wei zhi) TMS, 38: It is very effective against hepatitis and other liver diseases.

Meliaceae (Lian ke)

Melia azadarach L. (Lian shu) TMS, 68: Its seeds are used as anti diabetes. While its leaves juices are used to kill stomach worms and cure heat of it. It is also used as blood cleansing agent to cure pimples and acne from faces.

Orchidaceae (Lan ke)

Gastrodia elata Bl (Tian ma) TMS 69: The root and bark decoction is used as anti convulsion.

Papaveraceae (Ying shu ke)

Corydalis humosa Migo. (Yuan hu) TMS 27: The seeds of plant are used with milk as pain killer.

Poaceae (He ben ke)

Coix lacryma-jobi L.(Yi ren): Its extract of whole plant is effective against edema, spleen enlarge-ness and fever.

Letpochloa chinensis (L.) Nees. (Qian Jin zi) TMS 56: The plant extract is considered as cathartic, diminishes inflammation.

Setaria italica (L.) Beauv. (Su Xiao mei)TMS 95: The seeds of plant are crushed and mixed with some sugar and taken for making body strong and healthy.

Hordeum vulgare L. (Da mei) TMS 92: The seeds of plant are roasted, crushed with sugar to make juice for relief of stomach heat and fever, particularly in summer.

Polygonaceae (Liao ke)

Fallopia multiflora (Thunb.) Harald (*Polygonum multiflorum* Thunb.) (He shuo wu) TMS, 172: Its fruit and root decoction is taken to blacken the white hairs. While women use it after delivery as tonic for rapid blood production and get vigour.

Portulacaceae (Ma chi xian ke)

Portulaca oleracea L. (Ma chi qian) TMS, 129: Its leaf and shoot is used as vegetable for nephrolthiasis and root is crushed in water is used in jaundice, fever and stomachic.

Reynoutria japonica Houltt. (*Polygonum cuspidatum* Sieb. et Zucc.) (Hu zhang) TMS, 34: It is eaten to make body stronger and powerful.

Ranunculaceae (Mao ge ke)

Aconitum carmichaeli Debex. (Wu tou) TMS, 55: Its root extract is used to cure heart problems and it makes heart muscles powerful and strong.

Clematis chinensis Osbeck (Wei xing xian) TMS 24: The infusion of whole plant is used as anti rheumatism, pain killer and unblock the vessels and promotes blood circulation.

C. henryi Oliv. (Dan ye tie xian lian) TMS 201: Its root extract is used as antiseptic and it eliminates inflammation, promotes blood flow, relieves pain of body. Its leaf and stem decoction is used to promote Qi (A Vital energy) to activate blood flow in body.

C. apiifolia D.C. (Nu wei) TMS 202: Extract of whole plant is used as removing heat to brighten vision, inducing diuresis to reduce edema and it is lactogenesis.

C. apiifolia D.C. var. *obtusidentata* Rehd. et Wils. (Nu wei sp.) TMS 203: Stem infusion is used to cure urinary tract infection, nephritis, amenorrhea and scanty of lactation.

C. heracleifolia KOMAROV. (Da ye tie xian lian) TMS 225: The root of plant is used against treating boils and tumors. It is also effective in HIV treatment by local herbal healers.

C. argentilucida (Level. et. Vant.) W.T. Wang. (Cu chi tie xian lian)TMS 204: Whole decoction is used for promoting Qi to activate blood, dispelling wind and relieving pain. While its leaves extract is effective as anthelmintic.

Clematis finetiana Level. et. Vant.(Shan mu tang) TMS. 205: Root extract is used as dispelling wind and eliminating dampness, its stem decoction is used to relief brain, promote urination and leaf is considered to provide effective relief of joint pain.

C. courtoisii. H. Mazz (Da hua wei ling xian) TMS 207: Whole plant infusion is used for cooling heat and detoxication, eliminating phlegm and relieving cough, inducing diuresis to reduce edema and purgative.

Rosaceae (Qiang ke)

Cerasus japonica (Thunb.) Lois. (*Prunus japonica* Thunb.) (Yu xi ren) TMS 28: Its decoction of root is used as anti constipation, it is also used to promote urination and subsides swellings.

Chaenomeles sinensis (Thouin) Koehne. (Mu gua) TMS 29: The plant infusion is used to relieve rheumatism and dampness.

Sanguisorba officinalis L. (Di yu) TMS 30: Leaf juice is considered as haemostatic and its roots extract is used against snake bite as antidote.

Rosa laevigata Michx. (Jin ying zi) TMS 31: Its leaves decoction is used as laxative for relieve of stomachache.

Paonia lactiflora Pall. (Shao Yao) TMS, 65: Its decoction of root and leaves is used as anti inflammation and anticoagulant in joints pain and rheumatism.

Rubiaceae (Qian cao ke)

Galium aparine L. var. *echinospermon* (Waller.) Cufod. (Lala tang) TMS 73: The infusion of whole plant is used to cure renal pain, while its dried root powdered with *Capsicum annum* L. leaf extract made as small tablet and taken with milk of goat/sheep twice a day to cure night blindness.

Rutaceae (Yun xiang ke)

Euodia rutaecarpa (Juss.) Benth. (Wu zhu yu) TMS 33: Plant soup is used to cure cold, flu and cough.

Saururaceae (San bai cao ke)

Saururus chinensis (Lour.) Baill. (Yu xing cao) TMS, 190: Its roots decoction is used as anti bacteria.

Solanaceae (Qie ke)

Solanum nigrum L. (Long kui) TMS 232: Boiled leaves are eaten to cure kidney stone pain while its root decoction is effective against snake bite, with some other herbs. The fruit juice is used for relief of penis irritation.

Solanum melongena (Qie) TMS 212: Leaves are roasted in oil and applied on boils and barnacles for quick relief of pain and its root extract is used to cure scanty menstrual problems.

Stemonaceae (Bai bu ke)

Stemona japonica (Bl.) Miq. (Bai bu) TMS, 22: It is used as antihelminthic and cure stomach ach and flatulence of intestines.

Zingiberaceae (Jiang ke)

Zingiber officinale Rosc. (Jiang) TMS 101: Its tuber extract is used to cure stomachic, flatulence and treatment of cough.

Atractylodes lancea (Thunb.) D.C. (Bai zhu) TMS 52: Plant root extract is used against enlarged spleen and to promote urination for relieving inflammation. The leaf juice is used as anti perspirant.

Atractylodes macrocephala Koidz. (Pie lan) TMS 55: Root and bark decoction is used to relieve dampness and pathogenic factors.

DISCUSSION

In the study, main focus is paid to those sixty seven plants species reported by inhabitants for their traditional medicinal uses. From these fifty plants species are cited by three or more informants, but it does not mean that uses described by two or less informants are meaningless, but it may simply reflect that folklore knowledge about medicinal plants is gradually disappearing. Family Ranunculaceae (13.43%) is most predominant family of medicinal plants and it may be due to that easy availability or common distributed. Other predominant families are Rosaceae (7.46%) and Poaceae (5.97 %) etc. The most frequent medicinal plants are used to cure flu, fever, cough (8.51%), stomach problems (7.09%), joints pain and intestinal disorders/parasites (4.94%) each, (Fig. 2).

Medications forms and plant parts used: Roots are mostly widely used evenly solely or mixed with other plant parts followed by leaves, whole plant, seeds and stem (Fig. 1). The active use of roots is due to easy availability, massive storage of food (compounds) and leaves are second commonly used in daily treatments that may be as leaves are active in photosynthesis and production of various metabolic compounds. The most common mode of preparation and application was decoction, extraction, powder and pills and syrup and external usage was in form of poultice and demulcent. However some these folklore herbal uses are interesting and may be subjected to further research to find there chemical constituents to discover and develop new drugs.

Medicinal plants habitats and mode of collection: Most of plants are collected from wild sources. Only few are cultivated in home gardens and in farming plots as *Allium cepa*, *Setaria italica*, *Hordeum vulgare*, *Solanum melongena*, *Zingiber officinale* and some species as *Melia azadarach*, *Portulaca oleracea*, *Solanum nigrum*, *Magnolia officinale*, *Momordica charantia*, *Commelina bengalensis* and *Artemisia scoparia* were transferred

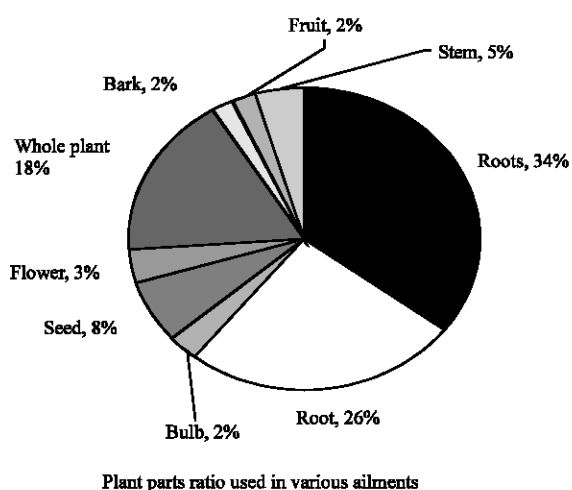


Fig.1: Plants parts usage in %age for different diseases

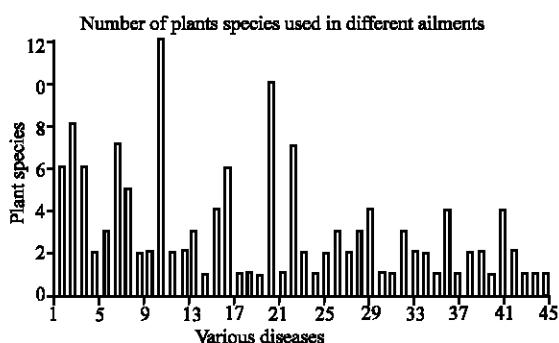


Fig. 2: Various diseases treated by different plant species:

1. Inflammation, 2. Liver/lungs problems, 3. Kidney stone, 4. Bone and muscle strengthening, 5. Head and tooth ach, 6. Constipation, 7. wound healing, 8. Depression, 9. IQ, 10. Flu/fever/cough, 11. Malaria, 12. Diabetes, 13. Typhoid, 14. Jaundice, 15. Rheumatism, 16. Epilepsy, 17. Leprosy, 18. T.B., 19. Viral infection, 20. Stomach problems, 21. Intestinal parasites, 22. Eye sight, 23. Boils, 24. Allergy, 25. Heart problems, 26. Snake/scorpion stung, 27. Anti tumors, 28. Asthma, 29. Flow of qi, 30. Diarrhoea, 31. Anticonvulsant, 32. Joint pain, 33. Enlarged spleen, 34. Edema, 35. Blackening of hair, 36. Diuresis, 37. Amenorrhoea, 38. Pimples, 39. Dispel wind, 40. night blind-ness, 41. Dampness, 42. Antibacteria, 43. Penis irritation, 44. Menstrual problems, 45. Antiperspirant

from wild area to home gardens and care was given to propagate it for easy availability and usage. The roots, being more frequently used (Fig. 1) are dug out from soil for local medicinal use and also sold in local market which has created a big threat for certain medicinal plant species.

Generally, mixtures of herbs are used as folk lore medicines and few times singly herb is also effective remedy against some disease. So usually, it is difficult to ascertain which herbal plant is effective against particular disease.

In present reported survey, we observed that twelve species are used against fever/flu/cough, ten plants are used for stomach disorders, seven species are used against different types of body pain, six species for curing inflammation, four species each are thought to be effective for hepatitis and spleen enlargement, three species each for diabetes, renal disorders, constipation and two species each for snake bite and malaria while in rest of diseases mentioned only one or two plant species are used (Fig. 2). The herbal prescriptions mentioned by local inhabitants have some interesting folklore recipes reported as; *Achyranthus bidentata* is used to cure renal calculi, *Acorus tatarinowii* is used is used to activate, sharpen brain and improve intelligence, *Taraxacum mongolicum* is effective as anti diabetes and cure of measles, *Artemisia scoparia* is used as anti hyperacid, anti diabetes and blood pressure moderator, *Melia azadarach* for cancer and diabetes, *Coix lacryma-jobi* and *Atractylodes macrocephala* for cure of enlarged spleen, *Aconitum carmichaeli* for treatment of heart problems, *Gallium aparine* for night blindness, *Solanum melongena* for scanty menses, *Clematis* genus species for lung disorders, edema, dispelling of wind and relief of brain hypertension. The acceptability and reliability on the local herbal medicines is quite high and common in inhabitants of TMSBR. The medicinal folklore of TMSBR as TCM seems to be developed by age-old, trial and error methods prolonging back to thousands of old traditional Chinese history which is being passed from generation to generation by oral ways and means. Moreover, the informants were quite happy to share their TCM knowledge, hopeful of helping to accelerate the development of medicinal activities in their area. As well as these local informants exchange their knowledge about different examples of various herbs among themselves, so co-operative views and ideas will be helpful to document the local skills and to involve their participation in development programmes of plant biodiversity conservation of the area.

Thus, the study ascertains the importance of these folk medicinal herbs being used in the ethnic communities of TMSBR, this ethnobotanical study project could be interesting step towards the isolation and pharmacological testing of single constituents from these herbs to discover new drug and develop drugs and evaluates the need of crucial and immediate steps for conservation of plant biodiversity in the area.

ACKNOWLEDGMENTS

Author is thankful to Prof. Chen J.H. for his kind help in plant identification and Prof. He Q and Prof. Zhu for conducting interview in local dialect and all the ethnic people of the area for sharing their traditional knowledge with us.

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