An ethnobotanical survey of medicinal plants used by tribal migratory shepherds in hills of Tungasigarh of Thunag Subdivision of district Mandi Himachal Pradesh

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Abstract

In Himachal Pradesh tribal migratory shepherds carry rich repository of traditional knowledge of wild medicinal plants and its uses, in this respect, an ethnobotanical survey was carried out in Tungasigarh and its surrounding area of Thunag Subdivision district Mandi Himachal Pradesh from 2018 to 2019. The required information on ethnomedicines used by tribal migratory shepherds was collected through personal field visits, interview method and by using a pretested questionnaire. Total 64 medicinal plant species were reported viz. Aconitum heterophyllum, Allium ursinum, Allium humile, Trillium govaninum, Bergenia ciliata, Berberis lyceum, Cannabis sativa, Dioscorea deltoidea, Rhododendron arboratum, Pistacia integerrima, Zanthoxylum armatum was recorded. Total of 64 species were documented herb species were dominant (48) followed by shrub (9), tree (7). This study shows that shepherds in tribal areas are highly dependent on ethnobotanical medicines, which evolved over generations of experience, for the healthcare. This survey can help as baseline data on ethnomedicinal plants used in Thunag subdivision of Mandi district and could be helpful in conservation of traditional knowledge as well as medicinal plants.

Keywords: Tungasigarh, Thunag, migratory shepherd, ethnomedicinal, Mandi, North Western Himalaya

Introduction

In India, it has been reported that about 90-95% collection of medicinal plants is collected from the wild area (Adhikari et al., 2010) [1]. The Indian Himalayan region is characterized by its unique ecosystem with a wide range of climates and habitat types which supports different flora and fauna. The Himalaya Hotspot is home to the world’s highest mountains. The mountains of Himalaya rise abruptly, resulting in a variety of ecosystems. Himachal Pradesh, a North Indian state, is located in the western part of the Himalaya. The state has a wide geographical area (55,673 km2) and altitudinal variation (350–7000 m amsl) with a rich assortment of biotic components. Himachal Pradesh has a forest cover of 27.72% and rich in medicinal plant species. The plant medications of inhabitants, handed down by word of mouth from one generation to the next generation, gradually became part of the knowledge of ancient civilization. Majority of the rural societies possess significant traditional knowledge of natural resources, which they have inherited from their forefather. Since long time traditional knowledge of ethnomedicines are used by our ancestors for their well-being and transferred orally to next generation (Sharma and Rana, 2016) [12]. Ethnobotanical work in different parts of Himachal Pradesh had been conducted by many workers (Dutt et al., 2014) [8]. Moreover, Himachal Pradesh has led to tribal ways of life, adherence to the primitive customs and traditions representing on enormous and difficult terrain of scattered human settlement (Chowdhery, 1999) [7]. Majority of the rural societies depend on this traditional knowledge for a variety of reasons related to the healthcare, social order, economy, shelter and food etc. Attention in herbal medicines has increased considerably as they are believed to be comparatively less toxic than the synthetic drugs and easily available from surroundings without any cost. The Migratory shepherds also take along with them few horses for carrying eatables and shelters. Often 4-5 dogs also accompany the migratory shepherds and, these dogs
are very well trained in protecting their livestock from wild animal attacks. They closely depend on this knowledge for a variety of reasons related to the social order, health care, economy, shelter, food, etc. However, if the efforts are not made with instant effect, the rich traditional knowledge possessed by these semipastoral shephards communities will vanish soon. This calls for an urgent need to document ethnomedicinal plant species of this area.

**Material and Method**

**Study area:** Himachal Pradesh (30° 22' 40" to 30° 12' 40" N latitudes and 75° 47' 55" to 79° 04' 20" E longitudes) is a North western Himalayan state of India which is a rich repository of ethnomedicinal flora. Most of these plant species find their use in traditional medicine, folk uses and also in modern industry (Singh and Thakur, 2014). Present study was carried out in the Tungasigarh area (3500m) of Thunag sub division (31.55°N, 77.17°E) at an altitude of 2052m, of district Mandi (31.5892°N,76.9182°E) Himachal Pradesh. The area is covered by dense forest of conifers and oak trees. This area is rich in medicinal flora and is having meadows which offer suitable site to perform the routine work for shephards. Soil is fertile and rich in humus and nitrogenous compounds but lacks phosphate compounds. The major soil groups are brown hill soil and red loamy soil. Most soil in this region are acidic in nature. Being a hilly valley climate is cool and temperate with three distinct season; the winter (October to March), the summer (April to June), the moonson (July to September). Highest temperature is recorded during May and June varying between 30 to 35. Lowest temperature is recorded during December and January month. The annual rainfall is around 1240mm.

**Method**

The important biodiversity of medicinal plants of Tungasigarh area of Thunag sub division was surveyed. For this survey, field trips of the entire area was undertaken between 2018 to 2019. The information on wild medicinal plants used by tribal migratory shephers in this area was collected by using pretested questionnaire, participatory observation, interviews and through discussion method. The fast acceleration of market pressure for medicinal plants, and recent disputes related to benefit sharing, the proper documentation of traditional knowledge is of vital priority (Singh and Batish, 2015; Yadav et al., 2014) [17, 19]. The continuation of traditional knowledge is risking as the transmission between the younger and older generations no longer exists (Kapoor, 2017) [11]. Therefore, proper documentation of the traditional information through ethnobotanical studies is significant for the utilization of biological resources and their conservation (Bagga et al., 2018) [4]. Difficult environmental conditions cause seasonal migration of shepherds from high hills to low hills in different parts of Himachal Pradesh. In the tribes of Himalayan region seasonal migration is a traditional process. It was notable that migration patterns of shepherds closely mirror the seasonal availability of natural fodder (Rao et al., 2011). These semipastoral shepherd carry along with them rich knowledge of traditional medicinal plants. But unfortunately there is no written documentation of ethnomedicinal plants used by shepherds in the Tungasigarh area inspite of frequent migration of shepherds. The traditional knowledge, plant biodiversity, and cultural practices of the tribal people are facing high threat due to fast urbanization.

**Table 1:** List of Ethnomedicinal plants used by semipastoral shepherd community.

| S. No. | Groups/Family/Plant species | Vernacular name | Habit | Ethnomedicinal properties |
|-------|-----------------------------|----------------|-------|--------------------------|
| 1.    | Fungi/Morchellaceae Morchella esculenta | Dunglu/ Guchhi | Herbs | Antioxidant, liver protection, edible, exhibit carcinogenic properties. |
| 2.    | Discinaeae Gyromitra esculenta | Ban dunglu | Herbs | Edible, antioxidant, exhibit carcinogenic properties. |
| 3.    | Pteridophytes/Adiantaceae Adiantum capillus | Barin | Herb | Cough, fever, menstrual problems, bronchitis. |
| 4.    | Equisetaceae/Equisetum arvense | - | Herb | Diuretic, dyspepsia |
| 5.    | Gymnosperm/Pinaceae/ Cedrus deodara | Dair | Tree | Ulcer, rheumatism, fuel and timber. |
| 6.    | Pinaus wallichiana | Kail,Bluepine | Tree | Treat wounds, sores, burns, boils, ulcer. |
| 7.    | Pinus roxburghii | Chir | Tree | Medicinal (Bone fracture, sprain, swelling, skin diseases, snake bite) |
| 8.    | Taxaceae/Taxus baccata | Rakhal | Tree | Beverages, treat asthma, bronchitis and bone fracture. |
| 9.    | Angiosperm/Aliaceae/Alium humile | Lahne | Herb | Stomachache, asthma, cold and cough. Edible. |
| 10.   | Allium ursianum | Jangli lahasun | Herb | Stomachic, infusion used against worms. Edible used as spice. |
| 11.   | Angiosperm/ Amaranthaceae Achyranthes aspera | Putkanda | Herb | Bronchitis, asthma, dysentery, cold, cough, stomachache. |
| 12.   | Anacardiaceae/ Pistacia integerrima | Kakar singhi | Tree | Cough, asthma, fever, appetite, pulmonary infection. |
| 13.   | Apiaceae/Angelica glauca | Chora | Herb | Dyspepsia, dysentery, ulcer, gastric pain. |
| 14.   | Heracleum candicans | Badiyacha | Herb | Leucoderma and menstrual complaints |
| 15.   | Selinium tenuifolium | Bhtukhesi | Herb | Nervine tonic, sedative |
| 16.   | Asteraceae/ Achilea milefolium | Fye | Herb | Cold, fever, epilepsy, gastric complaints, piles, stomulant. |
| 17.   | Ainsliea apera | Satjali | Herb | Stomach |
| 18.   | Artemisia nilagirica | Kubsh | Herb | Algesic, antiseptic, asthma, headache, nervous disorder, skin disease, sores wounds. |
| 19.   | Bidens pilosa | Bhaktumal | Herb | Cough cut ear and eye complaints, headache, leprosy, skin disease. |
| 20.   | Cirsium wallichii | Bhhrsha | Herb | Swelling, headache and pneumonia. |
| 21.   | Senecio graciliflous | Herb | Herb | Insect bite, ringworm disease and ear ache. |
| 22.   | Sonchus asper | Herb | Herb | Cuts and injuries |
| 23.   | Taraxacum officinale | Gahri phul | Herb | Blister, antioxidants, kidney diseases liver complaints, wounds. |
| 24.   | Begoniaceae/Begonia picta | Herb | Herb | Mouth ulcer, tougne bristle. |
| No. | Family                                     | Genus                  | Life Form | Parts Used | Medicinal Use                                                                 |
|-----|-------------------------------------------|------------------------|-----------|------------|-------------------------------------------------------------------------------|
| 25  | Berberidaceae/ Berberis aristata          | Kashmal                | shrub     |            | Malaria, piles, antidote to snake bite.                                        |
| 26  | Berberidaceae/ Berberis lyceum            | Kashmal                | shrub     |            | Eye disease, jaundice.                                                         |
| 27  | Betulaceae/Alnus nitida                   | Kosh                   | tree      |            | Cuts, wounds and stomachache.                                                  |
| 28  | Brassicaceae/Brassica officinalis          | Chuch                  | herb      |            | Kidney complaints, inflammation of skin, hypoglycaemic.                       |
| 29  | Cannabaceae/ Cannabis sativa              | Bhang/bijay            | herb      |            | Nerve stimulant, piles, skin diseases, cuts, dyspepsia, cramps, appetizer, sleep pills. |
| 30  | Caryophyllaceae/ Silene media             | Bariyala               | herb      |            | Bone fracture.                                                                |
| 31  | Celastraceae/ Euonymus pendulus           | Chopru                 | tree      |            | Dysentry, eye disease and headache.                                           |
| 32  | Chenopodiaceae/ Chenopodium album         | Bithu                  | herb      |            | Skin disease, uterine complaint.                                               |
| 33  | Cucurbitaceae/ Trichosanthes tricuspida   | Herb                   |           |            | Burns, diarrhoea, rheumatism, snake bite and vomiting.                         |
| 34  | Dioscoreaceae/ Dioscorea deltoidea        | Herb                   |           |            | Dysetery and pile.                                                            |
| 35  | Morinaceae/Morina longifolia              | Herb                   |           |            | Boils                                                                         |
| 36  | Fabaceae/Desmodium elegans               | Kathi                  | shrub     |            | Carminative, epilepsy.                                                        |
| 37  | Indigofera heterantha                     | Kali kathi             | shrub     |            | Veterinary disease urinary problems.                                          |
| 38  | Trifolium repens                          | Tin pati               | herb      |            | Astringent.                                                                   |
| 39  | Vigna vasillata                           | Herb                   |           |            | Cholera and ulcer.                                                            |
| 40  | Hypericaceae/ Hypericum japonicum         | Herb                   |           |            | Skin diseases.                                                                |
| 41  | H. oblongifolium                          | Kharau                 | shrub     |            | Wounds and boils.                                                            |
| 42  | H. uratum                                 | Ban wakra              | shrub     |            | Food poisoning.                                                               |
| 43  | Lamiaceae/Ajuga bracteosa                 | Neel kanth             | herb      |            | Root for diarrhoea and dysentery, ascariasis, fever.                           |
| 44  | Clinopodium ambrosam                      | Herb                   |           |            | Astringent, Carminative and Heart Tonic.                                      |
| 45  | Origanum vulgare                          | Bantulsi               | herb      |            | Cold, fever, hysteria, influenza, stimulant, tonic.                            |
| 46  | Elecraunesh coesta                        | Chichri                | herb      |            | Gastric complaint.                                                           |
| 47  | Thymus linearis                           | Madroshda              | herb      |            | Stomach ache, vermicidal, liver complaint, eye disorder.                      |
| 48  | Liliaceae/Polygonatum cirrhifolium        | Salam Mishri           | herb      |            | Appetite, nerve tonic, Edible.                                                 |
| 49  | Cardiocrinum gigantium                    | Herb                   |           |            | Leaves for wounds, bruises. Paste of roots applied for bone fracture.         |
| 50  | Loranthaceae/Viscaceae album              | Rhini                  | shrub     |            | Abortifacient, antifertility, bodyyache.                                       |
| 51  | Malvaceae/Malva verticillata              | Sochali                | herb      |            | Cough, piles, ulcer and urine complaint.                                      |
| 52  | Melanthaceae/Trillium govanianum          | Nagchatri              | herb      |            | Used to treat boils, dysentry, menstrual and sexual disorders, antiseptic and wound healing. |
| 53  | Oleaceae/Asminium                         | Banmalti               | shrub     |            | Skin disease, blood disease, and heart problem.                               |
| 54  | Podophyllaceae/Podophyllum hexandrum      | Ban kakri              | herb      |            | Cancer, cough, cuts wounds, fever, gastric ulcers, liver diseases.             |
| 55  | Polygonaceae/Fagopyrum dibotrys           | Fafra                  | herb      |            | Insect bite.                                                                  |
| 56  | Fagopyrum esculentum                      | Kathu                  | herb      |            | Typhoid, Lung disorder, urine complaint.                                     |
| 57  | Ranunculaceae/Aconitum heterophyllum      | Patish                 | herb      |            | Dyspepsia, diarrhoea, cough.                                                  |
| 58  | Rosaceae/Agrimonia pilosa                 | Kanaula                | herb      |            | Cough and urinary problem.                                                    |
| 59  | Principia utilis                          | Behkal                 | shrub     |            | Burns, cuts, wounds.                                                          |
| 60  | Urticaceae/Urtica dioica                  | Kugas                  | herb      |            | Antiseptic, dandruff and swelling.                                             |
| 61  | Valerianaceae/ Valeriana jatamansi        | Nihani                 | herb      |            | Antidot to sting of insect, hysteria, neurosis and skin diseases.             |
| 62  | Violaeneae Viola pilosa                   | Banaksha               | herb      |            | Cough, cold, fever and lung disease.                                          |
| 63  | Viola bifora                              | Banaksha               | herb      |            | Bronchitis, cold and cough.                                                   |
| 64  | Zingiberaceae/ Hedychium spicatum         | Ban haldi              | herb      |            | Asthma, bronchitis vomiting, dyspepsia.                                       |

### Life forms

Pie chart 1: depicting the life forms of study area: Herbs; 75%, Shrubs; 14%, Trees; 11%

Pie chart 2: Family 38, Genus: 57, Species: 64.
Results
The present study was carried out in the Tungasigarh area of Thunag subdivision of district Mandi, Himachal Pradesh. Documentation of the ethnomedicinal plants used by the semipastoral shepherds community was done. Concerning the ethnomedicines used by migratory shepherds in their own traditional health care system. A total of 64 ethnomedicinal plants were documented in study area. It was recorded that herb species were markedly high (48) followed by shrub (9), tree (7). Among these medicinal plant species, the maximum medicinal plants were used for cough, cold, skin, stomachache, cuts and wound healing etc. Shepherds are much dependant on forest produce for their requirement of fruits, vegetables and medicines. The fast acceleration of market pressure for medicinal plants, and recent disputes related to benefit sharing, the proper documentation of traditional knowledge is of vital priority (Singh and Batish, 2015; Yadav et al., 2014) [17, 19]. The continuation of traditional knowledge is risking as the transmission between the younger and older generations no longer exists (Kapoor, 2017) [11]. Therefore, proper documentation of the traditional information through ethnobotanical studies is significant for the utilization of biological resources and their conservation (Bagga et al., 2018) [4]. Unluckily, over exploitation of medicinal plants and the changing environmental conditions have made accessibility of medicinal plants as a scarce resource to the migratory shepherds during their seasonal migration. It is also highlighted that satisfactory attention has not been put in promoting and conserving traditional used medicinal plants. There is an urgent need to adopt large scale plantation of these medicinal plant species within the forests and roadsides so that the tribal shepherds are profited. It can be concluded that documentation of this traditional knowledge is novel information from the area of Thunag subdivision district Mandi, Himachal Pradesh.

Conclusion
Present study is the first attempt of survey in Tungasigarh area of Thunag subdivision of Mandi district, Himachal Pradesh, India. Dominant families recorded in the study areas were Asteraceae, Lamiaceae, Fabaceae, Apiaceae, Pinaceae. Angelica glauca, Allium ursanium, Hedychium spicatum, Viola specie, Trillium govanianum are well known medicinal plant species, used by shepherds and by local inhabitants contributing important role in the local health care system. Documentation of local medicinal knowledge is also essential due to outmigration of the younger. Study of ethnomedicinal knowledge helps identify the important species of the region for pharmacological importance and ecological sustainability and it also aids conservation of traditional knowledge. Migratory shepherds a tribal community of Western Himalaya were identified. They are using the plants for cough, cold, fever, stomachache, asthma, skin allergy, bone fracture, abdominal pain, jaundice, body pain, bone fracture, malaria, wound healing, tonic, etc., in various forms such as decoction, powder, paste, and juice. The foremost important thing is to give awareness and training to tribal migratory shepherds on a multidimensional basis about sustainable utilization of wild medicinal plant wealth in the hillside management for plant resources. This valuable survey may be useful to improve the pharmaceutical and application in the future.

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Shephard about to reach in the valley

Goat flocks being directed by shepherds

Horses and dogs parts of their herds

Shephards on the way towards their destination from plains to hilly region along with stud of horses.
Cardiocrinum giganteum plant and seedcases

Aesculus indica

Bergenia ciliata

Morchella esculenta

Harvested Morchella esculenta.

Gyrometra esculenta

Naustratium officinale
Fig 1: Migratory shepherd and few medicinal plants used by them

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