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Ethno-taxonomy of some useful plants in district Haridwar, Uttarakhand

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Abstract

The district Haridwar in Uttarakhand state has been the reservoir of enormous natural resources including vegetational wealth. The present work reveals the status of ethno-medicinal flora and their various importance preserved by native people in Haridwar region. Since inhabitants and tribal communities have strong faith and belief in traditional health care system. The people in remote villages and tribal areas depend upon the plants for their basic requirements, myths, customs and cultural rituals. For the present study on intensive field survey was made for district Haridwar. Local inhabitant have been interviewed along with herbal practioners, vaidhyas, cowherds, shepherds, farmers, ojhhas, sadhu-saint during the entire study for identification of plant species and to explore the traditional knowledge.

Keywords: Ethno-medicine, traditional knowledge, Haridwar region, local inhabitant

Introduction

Uttarakhand state is the newly state located in the Northern part of India crossed by the Himalayas, is the famous for its Hindu temples and pilgrimage sites. It is commonly known as Devbhoomi for its natural beauty of the Himalaya accompanied natural assets. The newly state was separated from the state Uttar Pradesh on 9th November, 2000. This is the 27th state of the Republic of India was created from the Himalaya and adjoining North-Western district of Uttar Pradesh. The holy district Haridwar came into existence on December 28, 1988 and separated from Saharanpur district. That time it was a part of the state Uttar Pradesh. Now it is a part of state Uttarakhand. Haridwar district is commonly termed as "Gateway of God" and also termed as Mayapuri, Kapila as well as Gangdwara. The followers of lord Shiva (Har) and followers of lord Vishnu (Hari) pronounce this place Haridwar. It is also an entrance to Devbhoomi and Chardham Yatra *i.e.* Badarinath, Kedarnath, Gangotri, Yamunotri etc. The holy district is generally famous for its natural vegetation, herbal practioners and traditional methods of applications. The term Ethno-taxonomy refers to sub-discipline within ethnology which studies the taxonomic systems defined and used by individual ethnic groups or to the operative individual taxonomy itself which is the object of the ethnologist's immediate study. J.W. Harshberger (1896) for the first time used the term "Ethno-botany" indicates plants used by the aborigines being an interdisciplinary science. Ethno-botany has been variably defined and elaborated by several plants explorers in the Uttarakhand Himalaya as well as other part of the country *i.e.* Schultes 1962^[1]; Jain 1986; Gaur and Tiwari 1999^[3]; Arora 1997. Hooker (1872-1897); Atkinson (1882); E.K. Janki Ammal (1954); Kanjilal (1901); Raizada (1976); Duthie's (1901-1903) and Babu (1977) worked on ethno-botanical plants in Uttarakhand Himalaya. Some interesting ethno-medicinal plants in Western Himalaya have been carried out by several plant explorers (Aswal 1993; Negi and Gaur 1994^[14]; Gaur 1999^[3]; Khajuria and Bisht 2017a)^[16]. Ethno-taxonomy of Haridwar district were studied by several plant explorers time to time *i.e.* (Uniyal 1962-63; 1977; Dhiman 1993-97; Kaushik and Dhiman 2000)^[17, 19, 18]. Recently, some plant explorers (Dangwal *et al.* 1993; 1994; 1995; 2000; Maikhuri *et al.* 2000; Kala 2007; Dhyani *et al.* 2007; Semwal *et al.* 2010; Tiwari *et al.* 2010; Rana *et al.* 2013; Ballabha *et al.* 2013; Sharma *et al.* 2014; Khajuria *et al.* 2017b)^[23, 28, 29, 21, 30, 31, 39, 32, 33, 27] etc. has been worked on ethno-medicinal plants in the different parts of Garhwal Himalaya. But there are only a few reports on the ethno-medicinal plant resources from the district Haridwar (Uttarakhand). Therefore, keeping in view the aforesaid facts, it is necessary to record the traditional knowledge about the utilization of ethno-medicinal plants and their general habit in various form of Haridwar district of Uttarakhand. Since, the incarnation of the life on earth, the plants are in existence in the world. Nature has provided bountiful gifts in the form of biodiversity and the human has been experiments and using the plants and their products according to his need.

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Plants yield flower, fruits, woods, timber, food, cloths, shelter, medicine, fuel, etc. The large human population with diverse life style beliefs, traditional and cultural heritage inhabiting Haridwar district has learnt to utilize natural resource and product in various ways. (Kaushik and Dhiman 1997; Mukesh and Shukla 2014). This paper attempts to present detailed information about a few plants being used by the people in this study area for their value.

Study area

The present study of Ethno-taxonomy of the plants has been carried out at Haridwar district, Uttarakhand, (India). The district covering several hills and plain with an area of about 2360 km² in South-Western part of Uttarakhand (India). It is situated in 29^o 96' Latitude in North and 78^o 16' degree longitude in East, and about 249.7 M.A.S.L.



Fig 1: Location Map of District Haridwar, Uttarakhand

Material and Methods

Extensive and intensive field survey was conducted in the study area in different months and seasons during the period 2014-2016, to collect ethno-taxonomical plants. Ethno-medicinal data was through personal interviews with the local inhabitants, especially with local vaidhyas or herbal medicinal practitioners. However, the information also gathered from housewives, rural old folk and grazers of long experience. Standard methods of collection, preservation and maintenance of specimens were followed by (Jain and Rao 1977; Subramaniam 2008). All the collected plant specimens were identified with the help of recent and relevant floras and identity was confirmed matching with the authentic specimens housed in the herbaria of Botanical Survey of

India, Northern Circle, (BSD), Dehradun, Forest Research Institute, Herbarium (DD), Dehradun and H.N.B. Garhwal Central University, Herbarium (GUH), Srinagar Garhwal. The plant specimens are deposited in the H.N.B. Garhwal Central University, S.R.T. Campus, Badshahi Thaul, Herbarium, Tehri Garhwal.

Enumeration of Taxa

For the systematic enumeration, plant names have been arranged in alphabetical order. The correct botanical name is followed by citation, family name (in parentheses), vernacular name, general habit of the plant, types of leaves, types of inflorescence, flower, fruit and flowering and fruiting season,

distribution with association ship, and ethno-medicinal uses have also been included in the text.

Mangifera indica L., Sp. Pl. 200. 1753; Hook. F. in Fl. Brit. India 2: 13. 1876; Duthie, Fl. U. Gang. Pl. 1: 189. 1903. (Anacardiaceae), Vern. Name- Aam, Ambi.

Perennial tree up to 45m long. Leaves petiolate, simple. Inflorescence large panicle. Flower staminate, yellowish green in colour. Fruit drupe. Flowering & Fruiting: Flowering- Dec. to February. Fruiting-March to May. Distribution upto 1200m.a.s.l.; collected from village Jwalapur, district Haridwar, associated with *Adathoda vasica*, *Dalbergia sissoo*, *Cassia occidentalis*, *Ricinus communis*, *Eucalyptus citriodora* etc.

Ethno-Medicinal Uses: Fresh leaves dry in shady places and make powder, powder of the leaves taken one teaspoon with water, useful for diabetic patients. Fresh flower mixed with castor-oil, and after boiling the oil it cold, 1-2 drop of the oil used in earache. Unripe fruit juice is taken with water in sunstroke. Ripened fruit juice is best tonic to make strong nervous system, liver, and used in infertility. Mature keystone crush with water is useful for amoebiasis.

Calotropis procera (Aiton) Dryander in Aiton f., Hort. Kew. Ed. 2.2: 78. 1811; Hook. F. in Fl. Brit. India 4: 18. 1823; Duthie, Fl. U. Gang. Pl. 2: 48. 1922; Babu, Herb. D. Dun 304. 1977. *Asclepias procera* Aiton, Hort. Kew. 1: 305. 1789. (Asclepiadaceae), Vern. Name-Aak, Aakha, Madar.

Perennial shrub up to 2m height. Leaves cauline, simple, opposite. Inflorescence umbellate, cyme. Flower pedicellate, purplish red to white. Fruit paired in follicles. Flowering & Fruiting: Flowering-Dec. to February. Fruiting-February to April. Distribution upto 1000m.a.s.l. collected from village Pathri, district Haridwar; associated with *Ricinus communis*, *Desmostachya bipinnata*, *Achyranthus aspera*, *Agave wightii* etc.

Ethno-Medicinal Uses: Soft and fresh leaves taken orally with jaggery in piles. Leaves with butter bind on buffalo neck wound. Flower mixed with honey is useful in cough, cold and asthma. Latex used for wound to expel puss. Root bark paste make with water and applied for leprosy.

Tagetes erecta L. Sp. Pl. 887. 1753; Babu, Herb. Fl. D. Dun 284. 1977. (Asteraceae), Vern. Name-Genda.

Annual herb upto 50-60cm height. Leaves cauline, simple, alternate. Inflorescence capitulum. Flower solitary, raceme, yellow to orange in colour. Fruit achene. Flowering & Fruiting: Flowering-Aug. to Nov. Fruiting-Jan. to March. Distribution on 300-1800m.a.s.l. collected from village Sherpur Khelmau, district Haridwar; associated with *Catheranthus roseus*, *Cascabela thevetia*, *Rosa indica*, *Cynadon dactylone* etc.

Ethno-Medicinal Uses: Fresh leaves crush with water and make the paste applied on face to protect sun burn. Leaves boiled with water and to gargle used for toothache. Fresh leaves 20gm + 100ml water + 50gm honey useful in leucorrhoea. Shoot and leaf paste applied on skin disease. 100gm flower petal juice mixed with equally desi ghee useful in piles bleeding. Seed oil used for hair tonic.

Cannabis sativa L. Sp. Pl. 1027. 1753; Hook. F. in Fl. Brit. India 5: 487. 1888; Babu, Herb. Fl. D. Dun 474. 1977. *C.indica* Lam., Encycl. 1: 695. 1783. (Cannabinaceae), Vern. Name-Bhang.

Annual herb up to 150cm high. Leaves simple. Inflorescence pistillate. Flower axillary cluster in greenish white colour.

Fruit achene. Flowering & Fruiting: Flowering-March to July, Fruiting-June to September. Distribution up to 1900m.a.s.l. collected from village Bashwakhedi, district Haridwar; associated with *Sida cordifolia*, *Cyanodon dactylon*, *Achyranthus aspera*, *Desmostachya bipinnata* etc.

Ethno-Medicinal Uses: Leaves crushed with cold water and applied on skin disease. Leaves dried in shady place and make powdered, 5gm powder with water taken orally useful in cough & cold. Leaves and flower dry in shady place, and rub on palm for bhang, charas, ganja, it is supposed to be useful in insomnia, depression and pain. Leaves juice mixed with sugar applied to cut and wounds. Seed oil useful in rheumatism.

Brassica rapa L. ssp. *campestris* (L.) Clapham in Fl. Brit. Isles ed. 2: 124. 1962; Hajra & Chowdhery in B.D. Sharma *et al.* Fl. India 2; 138. 1993. *B. campestris* L. Sp. Pl. 666. 1753; Hook. f. & Anderson in Fl. Brit. India 1: 156. 1872; Babu, Herb. Fl. D. Dun 54. 1977. *B. rapa* L. var. *campestris* (L.) Petermann, Fl. Lips. 491. 1838. (Brassicaceae) Vern. Name-Sirson, Sarson, Kali Sarsoon.

Annual herb upto 1m long. Leaves simple, sessile. Inflorescence axillary, terminal raceme. Flower pedicellate, complete, yellow in colour. Fruit siliqua (pod). Flowering & Fruiting: Flowering-Dec. to March, Fruiting-Jan. to April. Distribution on 500-2800m.a.s.l. collected from village Tikola Kalan, district Haridwar; associated with *Triticum aestivum*, *Saccharum officinarum* etc.

Ethno-Medical Uses: Seed oil mixed with turmeric powder and applied on cut and wounds. Garlic boiled with seed oil and after cold 2-3 drops used in earache. Oil mixed with saindhaw salt useful in tooth problem. Seed oil and wax boiled used for cracking skin. Seed oil massage useful for headache and hair growth. Seed oil applied on navel before taken bath for crack lips.

Ricinus communis L., Sp. Pl. 1007. 1753; Hook. F. in Fl. Brit. India 5: 457. 1888; Babu, Herb. Fl. D. Dun 464. 1977; Naithani, Fl. Chamoli 2: 572. 1985. (Euphorbiaceae), Vern. Name-Arand, Arandi, Andi.

Perennial shrub upto 6m long. Leaves simple, alternate, serrate, palmately 5-11 lobed. Inflorescence terminal subpanicked, racemes. Flower born in spike, yellowish-green in colour. Fruit capsule regma with spine. Flowering & Fruiting: Flowering-February to March, Fruiting- Aug. to Dec. Distribution upto 1400m.a.s.l. collected from Bahadradabad, district Haridwar; associated with *Calotropis procera*, *Achyranthus aspera*, *Solanum nigrum*, *Amaranthus spinosus* etc.

Ethno-Medicinal Uses: Fresh leaves juice useful for intestinal worm, night blindness. Leaves with mustered oil bind on body swelling. Fruit powder with water useful in piles and liver diseases. Seed oil 5-10 drop mixed with milk and drink for constipation.

Ocimum tenuiflorum L. Sp. Pl. 597. 1753; Naithani, Fl. Chamoli 2: 514. 1985. *O.sanctum* L. Mant. Pl. 1: 85. 1767; Hook. F. in Fl. Brit. India 609. 1885. (Lamiaceae), Vern. Name-Tulsi, Tulsa.

Biennial or Triennial herb. Upto 75cm high. Leaves simple, opposite. Inflorescence verticillaster. Flower pedicellate, bracteates purplish in colour. Fruit corcerulus (drynutlets). Flowering & Fruiting: Flowering-July to Oct. Fruiting-Oct. to Dec. Distribution on 1200m.a.s.l. collected from village Gadarjudda, district Haridwar; associated with *Rosa indica*,

Sansevieria trifasciata, *Aloe barbadensis*, *Majorana hortensis* etc.

Ethno-Medicinal Uses: Fresh leaves decoction with turmeric powder and salt is useful for cough and cold. Fresh leaves 20gm with 1 garlic bud used to treat ringworm. Leaves juice with ginger juice mixed and hot which is useful in stomach pain of child. Leaves juice with honey is useful for kidney stone. Seeds and *Betula* leaves crushed and taken orally for increase the rate of fertility in women. 6gm seeds kept in water for some hour and mixed mishri, taken orally for treat to urinary disease and genital weakness. Root crushed with water and given in snake and scorpion bite.

Azadirachta indica A.H.L. Juss. In Mem. Mus. Nat. Hist. Paris 19: 221. t. 2. f. 5. 1830. *Melia azadirachta* L., Sp. Pl. 385. 1753; Hiern in Hook. f. Fl. Brit. India 1: 544. 1855; Duthie, Fl. U. Gang. Pl. 1: 150. 1903. (Meliaceae), Vern. Name-Neem.

Perennial tree up to 25m height. Leaves compound, alternative, pinnate. Inflorescence axillary, panicle. Flower pedicillate, white coloured. Fruit berry. Flowering & Fruiting: Flowering-March to April, Fruiting-June to July. Distribution on 1000m.a.s.l. collected from village Shyampur district Haridwar; associated with *Dalbergia sissoo*, *Eugenia jambolana*, *Toona ciliata* etc.

Ethno-Medicinal Uses: Leaves boiled with water and to taken bath for relief in itching, allergy. Fresh leaves juice is useful for stomach worm, blood purifier, fever, wound, achne, pimple, leucorrhoea, diabetes. Soft twig use as brush for cleaning teeth and healthy gums. Fruits with *Ocimum sanctum* root crush and take with curd in piles. Seed oil use on hair for treatment to louse.

Albizia lebbek (L.) Benth. In Hook, London J. Bot. 3: 87. 1844; Baker in Hook. F. Fl. Brit. India 2: 298. 1878; Duthie, Fl. U. Gang. Pl. 1: 320. 1903; Naithani, Fl. Chamoli 1: 185. 1984. *Mimosa lebbek* L., Sp. Pl. 516. 1753. *Acacia lebbek* (L.) Willd. Sp. Pl. 4: 1066. 1806. (Mimosaceae), Vern. Name-Siris, Siras.

Perennial tree 20m height. Leaves compound, bipinnate, alternate. Inflorescence corymbiform, panicles. Flower globose umbellate, greenish white in colour. Fruit pod. Flowering & Fruiting: Flowering-April to June, Fruiting-Aug. to Dec. Distribution upto 1200m.a.s.l. collected from village Saidpura, district Haridwar; associated with *Eucoalyptus utriodora*, *Dalbergia sissoo*, *Terminalia arjuna*, *Ziziphus jujube* etc.

Ethno-Medicinal Uses: Flower decoction is useful in Asthma. Bark decoction is useful for skin disease, piles, toothache. Root bark powder us a dental powder. Seed powder (1 teaspoon) with water taken in dysentery, blindness, increase to fertility. The root bark powdered with root gum is uses as a dental powder for strengthening the gums.

Ficus benghalensis L. Sp. Pl. 1059. 1753; Hook. F. in Brit. India 5: 499. 1888; Naithani, Fl. Chamoli 2: 579. 1985. (Moraceae), Vern. Name-Bargad, Bar, Vata.

Perennial tree upto 30m height. Leaves simple, alternate spinally arranged coriaceous elliptic to ovate. Inflorescence hypanthodium. Flower sessile, pink to black in colour. Fruit figs.

Flowering & Fruiting: Flowering-March to May, Fruiting-June to Oct. Distriution about 1200m.a.s.l. collected from Mohand, district Haridwar; associated with *Toona ciliate*, *Dalbergia sissoo* etc.

Ethno-Medicinal Uses: Leaves paste useful for wound and leprosy. Leaves paste with cow ghee use for relief to burn pain. Young tips of aerial root crushed and boil with cow milk and drink treat to piles. Aerial root used as brush treat to pyorrhea in teeth. Plant leaf latex paste on joint to relief pain and 5-10 drop latex with 2 pieces of jaggery taken in empty stomach at morning for nightfall.

Ficus religiosa L. Sp. Pl. 1059. 1753; Hook. F. in Fl. Brit. India 5: 513. 1888; Naithani, Fl. Chamoli 2: 581. 1985 *Urostigma religiosum* (L.) Gasparini, Ric. Caprifico. 82. t. 8. 1845. Vern. Name-Pipal, Pippal, Bahaman.

Deciduous tree upto 35m height. Leaves simple, alternate, spinally arranged broadly elliptic obovate or suborbicular. Inflorescece hypanthodium. Flower sessile or pedicillate, pink to black in color. Fruit figs. Flowering & fruiting: Flowering-April to May, Fruiting-May to September. Distribution on 1400m.a.s.l. collected from village Daulatpur, district Haridwar; associated with *Mangifera indica*, *Hibiscus-rosasinesis*, *Bombax ceiba* etc.

Ethno-Medicinal Uses: Leaves juice is useful for skin disease. Fruit eaten for menstrual disorder. Stem bark powder with water useful for leucorrhoea, vaginal disease, diabetes. Bark powder mixed with water and made paste, applied on ulcer inflammation, burn wound. Rhizome kept in water for some hour and drink the water for increase fertility in male.

Musa balbisiana Colla, Mem. Gen. Musac. 56. 1820; Cheesman in Kew Bull. 1948: 14. 1948; Hara in Ohashi, Fl. E. Himal. 3: 136. 1975. *M. sapientum auct. Non L.*, Syst. Pl. 1303. 1759; *sensu* Baker in Hook. F. Fl. Brit. India 6: 262. 1892 *p.p.* *M. paradisiaca* L. Sp. Pl. 1043. 1753 ssp. *sapientum* (L.) K.Schumann in Engler. Pflanzenr. 45: 20. 1900. (Musaceae), Vern. Name-Kela.

Annual, shrub upto 2.5m high. Leaves oblong and narrowed at base. Inflorescence compound spadix. Flower cymose cluster of flower in bluish colour. Fruit berries. Flowering & Fruiting: Flowering-Throughout the year, Fruiting-Throughout the year. Distribution on 300-2000m.a.s.l. collected from village Narsan, district Haridwar; associated with *Eugenia jambolana*, *Azadirachata indica* etc.

Ethno-Medicinal Uses: Flower extract are useful treat to diabetes, and dropsy. Fruit with 5gm desi ghee increase the fertility in male. Fruit juice used for removes to kidney stone. Fruit are useful in tuberculosis. Fruit pulp used in burn and avoid to postulates. Root and stem decoction about 20ml is treatment of blood purification and venereal disease.

Nelumbo nucifera Gaertner, Fruct. Sem. 1: 73. t. 19. 1788; Babu, Herb. Fl. D. Dun 48. 1977. *Nelumbium speciosum* Willd. Sp. Pl. 2: 1258. 1799; Hook. F. & Thomson in Fl. Brit. India 1: 116. 1872. (Nelumbonaceae), Vern. Name-Kamal.

Perennial aquatic herb upto 10cm height. Leaves simple long petiole. Inflorescence cymose type. Flower pedicillate, solitary, pinkish- red in colour. Fruit indehiscent follicle. Flowering & Fruiting: July to Aug. Distribution on upto 1500m.a.s.l. collected from village Lakhnaouta, district Haridwar; associated with *Trapa bispinosa*, *Chara*, *Ipomea carnea* etc.

Ethno-Medicinal Uses: Androecium of the flower mixed with butter given to pregnant lady for uterus tonic. Flower 50-150gm boiled with water and drink for control to heart beat. Flower and white sandal powder (*Santalum album*) mixed with mulathi (*Glycyrrhiza glabra*) and nagar-motha (*Cyperus scarioscus*) made mixture and the extract is useful for heart

attack, mental stress, sleepness. Flower boiled with goat milk and drink for eye disease and pain. Gulkand (sugar + flower mixed) used for constipation.

Cortaderia sellona (Schultes & Schultes F.) Ascherson & Graebner, syn. *Mitteleur*. Fl. 2(1): 325. 1900 (Poaceae), Vern. Name-Bind, Ikkadsara.

Annual shrub upto 3m high. Leaves alternate simple, serrate, parallel. Inflorescence large silky and plummy like panicle. Flower dense white panicle (spikelet), silvery white in colour. Fruit caryopsis. Flowering & Fruiting: Flowering-February to April, Fruiting- Aug to Dec. Distribution on 1900m.a.s.l. collected from village Khanpur, district Haridwar associated with *Capparis zeylanica*, *Acacia farnesiana*, *Acacia arabica*, *Lantana camara* etc.

Ethno-Medicinal Uses: Root decoction is used to treat allergy. Root ash with mattha (lassi) give to buffalos, avoid to abortion.

Cynodon dactylon (L.) Persoon, Syn. Pl. 85. 1805; Hook. F. in Fl. Brit. India 7: 288. 1896; Bor,

GBCIP 469. 1960; Babu, Herb. Fl. D. Dun 598. 1977; Naithani, Fl. Chamoli 2: 738. 1985. *Panicum dactylon* L. Sp. Pl. 58. 1753. Vern. Name-Doob, Doobda, Doobadwa, Dobbad. Perennial herb, 30cm high. Leaves distichously narrowly linear or lanceolate glaucous. Inflorescence raceme. Flower spikelet, green purplish in colour. Flowering & Fruiting: Flowering-Aug. to Sept. Fruiting-Sept. to Dec. Distribution on 2500m.a.s.l. collected from village Bandarjud, district Haridwar; associated with *Trianthema portulacastrum*, *Amaranthus spinosus*, *Sida cordifolia* etc.

Ethno-Medicinal Uses: Plant poultice used on wound. Root decoction with honey is useful for urolithiasis. Infusion of roots used for stopping bleeding from piles. Hot stem is chewed in cough and also useful in menstrual disorder.

Desmostachya bipinnata (L.) Stapf in Dyer, Fl. Cap. 7: 632. 1900; Bor, GBCIP 491. 1960; Babu, Herb. Fl. D. Dun 600. 1977. *Briza bipinnata* L. Syst. Nat. 10: 875. 1759. *Eragrostis cynosuroides* P. Beauv. Ess. Agrost. 71, 162. 1812; Hook. F. in Fl. Brit. India 7: 324. 1896. Vern. Name-Daab, Dabbi.

Perennial herb up to 35-150cm. Leaves with filiform tips, with hispid margins. Inflorescence Sessile, imbricating spikelets. Flower erect, spike like panicle, purple brown in colour. Fruit grain. Flowering & Fruiting: July to Nov. Distribution on up to 1200m.a.s.l. collected from village Latherdeva Hoon, district Haridwar; associated with *Kirganelia reticulata*, *Digera muiricata*, *Xanthium indicum* etc.

Ethno-Medicinal Uses: Culms are useful in dysentery, jaundice in form of decoction. Root powder mixed with starch, cumin (*Cuminum cyminum*) powder and sugar is useful in Leucorrhoea. Root decoction is beneficial to arrested and scanty urination. Root and culms decoction given in asthma.

Hordeum vulgare L., Sp. Pl. 84. 1753; Hook. f. in Brit. India 7: 371. 1896; Naithani, Fl. Chamoli 2: 755: 1985. Vern. Name-Jaun.

Annual herb 70-80cm in height. Leaves flaccid, linear with smooth sheath and short membranous ligules. Inflorescence spike flattened. Flower sessile, green in color Fruit achenes, elliptic. Flowering & Fruiting: Flowering-February to March, Fruiting- March to April. Distribution on 300-2600m.a.s.l. collected from Jhabrera, district Haridwar; associated with

Triticum aestivum, *Brassica campestris*, *Chenopodium album*, *Stellaria media* etc.

Ethno-Medicinal Uses: Seed flour is useful in high blood pressure, inflammation, immune disorder, cancer, indigestion, constipation. Seed flour mixed with jaggery and taken one teaspoon then drink water for coldness in summer. Seed powder boiled with water and applied on scabies and itching.

Oryza sativa L. Sp. Pl. 333. 1753; Hook. F. in Fl. Brit. India 7: 92. 1896; Bor, GBCIP 605. 1960; Babu, Herb. Fl. D. Dun 627. 1977; Naithani, Fl. Chamoli 2; 751. 1985. Vern. Name-Chawal, Munji, Dhaan.

Annual herb upto 60cm in height. Leaves alternate, cauline, sessile. Inflorescence a terminal panicle. Flower sessile, bracteates, yellow in color. Fruit caryopsis. Flowering & Fruiting: Flowering-August to Sept. Fruiting-August to October, Distribution on upto 1200m.a.s.l. collected from Alawalpur, district Haridwar, associated with *Cyperus rotunds*, *Alternanthera sessilis*, *Dactyloctenium aegygium* etc.

Ethno-Medicinal Uses: Seed after boiled is useful for control to cardiac disease, excess cholesterol, hypertension. After boiled to rice, the remaining rice water (maand) mixed with deshi ghee and Cumin, used for increase to weight and feeling strong. Rice water with deshi ghee is used as a refried and drink treat to inflammatory disease and in dysuria.

Saccharum officinarum L. Sp. Pl. 1: 54. 1753; Bor, GBCIP 212. 1960. Vern. Name- Ganna. Ganda, Enkh, Ponde.

Mostly biennial, herb, 2-5m in height. Leaves erect, lanceolate linear margins scabrid. Inflorescence terminal, panicle raceme. Flower panicle whitish pink colour. Fruit-Grain. Flowering & Fruiting: Flowering- April to May, Fruit- April to May. Distribution on up to 1400m.a.s.l; collected from village Lakshar, district Haridwar; associated with, *Zea mays*, *Convolvulus arvensis*, *Cyperus rotundus*, *Cyperus iria*, *Mukia maderaspatana*, *Cajanus cajan*, *Melochia corchorifolia* etc.

Ethno-Medicinal Uses: Leaf juice 5-10ml useful in bronchitis and cough. Leaf juice mixed with Limon juice applied on joint pain. Stem buds chewed for expel to cough. Stem chewed in jaundice, anemia, hepatitis, fatigue, seminal weakness, urinary disorder etc. Root decoction useful for urinary disorder.

Triticum aestivum L. Sp. Pl. 85. 1753; Bor, GBCIP 679. 1960. *T. vulgare* Villars, Hist. Pl. Dauphine 2: 153. 1787. Vern. Name-Genhu, Naaj, Saadhi.

Annual herb upto 40-70cm high. Leaves alternate, simple distichously. Inflorescence a spike of spikelets. Flower inconspicuous, sessile, yellow in color. Fruit caryopsis. Flowering & Fruiting; Flowering-February to March, Fruiting- March to April. Distribution on 1500m.a.s.l. collected from village Bhagwanpur, Haridwar; associated with *Brassica campestris*, *Chenopodium album*, *Rumex obtusifolius*, *Stellaria media* etc.

Ethno-Medicinal Uses: Infusion of leaves drunk like tea for constipation. Immature plant juice is taken for anti-ageing and to purified blood and increase immunity. Seeds kept in water for 5-6 hour and chewed to increase fertility in women. Seed flour mixed with jaggery, milk and ghee and then boiled, after cold it is useful for increase the fertility rate of male. Seed sprouted and used to treat sore throat, cough and muscular pain.

Ziziphus mauritiana Lam., Encycl. 3: 319. 1789; Santapau in J. Bomb. Nat. Hist. Soc. 51: 802. 1953; Naithani, Fl. Chamoli 1: 123. 1984. *Z. jujube* (L.) Gaertner, Fruct. Sem. Pl. 1: 203. 1788; Lam, Encycl. 3: 318. 1789; Lawson in Hook. f., Brit. India 1: 632. 1875; Duthie, Fl. U. Gang. Pl. 1: 163. 1903. *Rhamnus jujuba* L. Sp. Pl. 197. 1753. (Rhamnaceae), Vern. Name-Ber, Beri.

Perennial shrub or small tree 5-10m height. Leaves alternate, variable, ovate oblong. Inflorescence axillary, sessile, cymes or fascicles. Flower axillary, cymose, greenish in colour. Fruits drupes. Flowering & Fruiting: Flowering-April to Oct. Fruiting-Oct. to March. Distribution on upto 1500m.a.s.l. collected from village Gaidikhata, district Haridwar; associated with *Lantana camara*, *Tribulus terrestris* etc.

Ethno-Medicinal Uses: Leaves paste used on scorpion bite. Leaves boiled with water and wash hair for treat to hair loss. Bark boiled in water and used as like soup against, dysentery, diarrhea. Bark powder 2.5gm mixed with jaggery, is useful in leucorrhoea. Dried fruit powder is anti-cancerous and increase fertility. Root powder use in ulcer, wound.

Rosa indica L. Sp. Pl. 492. 1753. (Rosaceae), Vern. Name-Gulab.

Perennial shrub up to 95cm height Leaves compound, alternate. Inflorescence axillary solitary raceme. Flower pedicillate, actinomorphic, reddish in colour. Fruit pom. Flowering & Fruiting: Flowering- Jan. to March, Fruiting-April to July. Distribution up to 1500-3000m.a.s.l. collected from Roorkee, district Haridwar; associated with *Tagetes erecta*, *Catharanthus roseus*, *Sansevieria trifasciata*, *Mirabilis jalapa* etc.

Ethno-Medicinal Uses: Flower catch-up useful for heartbeat control and anxiety. Dry powder of flower petals is mixed with water and mishri used to treat piles and leucorrhoea. Gulkand (mixture of flower petals and sugar) mixed with milk useful for constipation. Gulabjal with glycerine 25ml and 1 Citrus lime juice mixture applied on face for skin softness.

Aegle marmelos (L.) Correa in Trans. Linn. Soc. 5: 222. 1800; Hook. F. in Fl. Brit. India 1: 516. 1874; Raizada & Saxena, Fl. Muss. 98. 1978. *Crateva marmelos* L. Sp. Pl. 444. 1753. (Rutaceae), Vern. Name-Bel, Belpatra.

Deciduous tree 6-15m long. Leaves alternate attenuate, compound, trifoliolate. Inflorescence axillary, panicle cyme. Flower pedicillate, panicle, greenish white in colour. Fruit berry Flowering & Fruiting: Flowering-February to March, Fruiting- May to Aug. Distribution on 1200m.a.s.l. collected from Imlikhera, district Haridwar; associated with *Codridia dichotoma*, *Acacia farnesiana*, *Acalypha fruticosa* etc.

Ethno-Medicinal Uses: Poultice of leaves useful for ulcer, ophthalmia. Leaves 50gm crushed in water and mixed with mishri is useful for acidity. Leaves juice and butter is useful in the treatment of mouth sores. Root decoction is used in intermittent fever. Ripened fruit is best source for healthy digestive system.

Citrus medica L., Sp. Pl. 782. 1753; Hook. F. in Fl. Brit. India 1: 515. 1875; Naithani, Fl. Chamoli 1: 111. 1984. Vern. Name-Nimboo, Nimmu.

Perennial shrub 4-5m long. Leaves simple, alternates. Inflorescence axillary cymose. Flower Pedicillate, pinkish white in color. Fruit berry (hesperidium). Flowering & fruiting: Flowering-March to April, Fruiting-Oct. to Dec. Distribution on 1000m.a.s.l. collected from village Jhabreri Kalan, district Haridwar; associated with *Carica papaya*, *Embllica nucifera*, *Mangifera indica* etc.

Ethno-Medicinal Uses: Fruit juice mixed with water and black salt, is drink for stomach pain, constipation and indigestion, gastric problem. Fruit juice, cumin (*Cuminum cyminum*) extract, cardamom (*Coriandrum sativum*) fruit boiled with water and is taken in vomiting. Two teaspoon of lemon juice and 1 teaspoon of honey mixture is used for dandruff and hair loss problem. Fruit juice with naushadar applied on ringworm. One teaspoon fruit juice with 1-2 teaspoon honey and one glass water is useful for loss fat.

Curcuma domestica Valetton, Bull. Jard. Bot. Buitenzorg ser. 2.27: 31. 1918; B.L. Burtt & R.M. Smith, Notes Royal Bot. Gard. Edinb 31: 185. 1972. *C.longa* non L. Sp. Pl. 2. 1753; *sensu* Baker in Hook. F. Fl. Brit. India 6: 214. 1890; Naithani, Fl. Chamoli 2: 638. 1985. (Zingiberaceae), Vern. Name-Haldi.

Perennial herb, 60-150cm long. Leaves oblong, simple, lanceolate, tapering to the base. Inflorescence terminal spike. Flower sessile. Fruit rhizome. Flowering & Fruiting: April to June. Distributed on 1500m.a.s.l; collected from village Susada, district Haridwar; associated with *Zingiber officinale*, *Ciliata toona*, *Capsicum annum*, *Ageratum conyzoides*, *Pseudognaphalium luleo album* etc.

Ethno-Medicinal Uses: Rhizome and goat milk mixed and drink in estoppels. Rhizome powder and salt mixed with water and after hot make its paste used to dissolve blood clot. Rhizome powder in butter applied on skin in itching and ringworm. Rhizome powder mixed with gram seed (*Cicer arietinum*) powder and Lemon juice, the mixture useful in face pack. Powder of rhizome mixed with hot milk and sugar, drink in sinusitis, heart pain, arthritis, cough etc.



Mangifera indica



Calotropis procera



Tagetes erecta



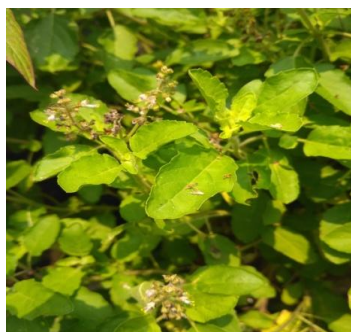
Cannabis sativa



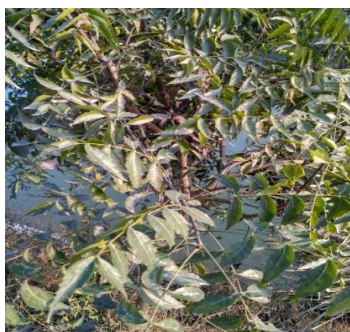
Brassic rapa



Ricinus communis



Ocimum tenuiflorum



Azadirachta indica



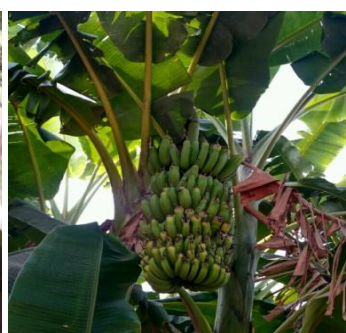
Albizia lebeck



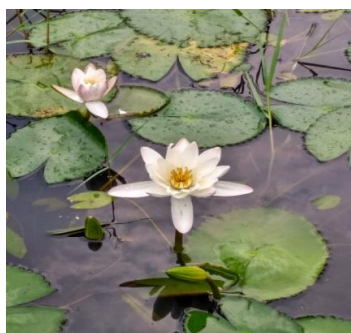
Ficus benghalensis



Ficus religiosa



Musa balbisiana



Nelumbo nucifera



Cortaderia sellona



Cynodon dactylon



Desmostachya bipinnata



Hordeum vulgare



Oryza sativa



Saccharum officinarum



Triticum aestivum



Ziziphus mauritiana



Rosa indica



Aegle marmelos



Citrus medica



Curcuma domestica

Result and Discussion

The present work has yielded some promising results for some unknown or lesser known ethnomedicinal plants, which belongs to some 25 plants species 17 families. There is variety of plant population in the study area but some of the ethno-taxonomically high population of 6 plant species has been mentioned in the present text. These are *Brassica rapa*, *Cannabis sativa*, *Cynodon dactylon*, *Oryza sativa*, *Saccharum officinarum*, *Triticum aestivum*. 7 species are common *Albizia lebbek*, *Azadirachta indica*, *Citrus medica*, *Mangifera indica*, *Ocimum tenuiflorum*, *Rosa indica*, *Tagetes erecta* etc. But in the study area population of these 10 plant species uncommon. These species are *Aegle marmelos*, *Calotropis procera*, *Cortaderia sellona* *Curcuma domestica*, *Desmostachya bipinnata*, *Ficus religioisa*, *Hordeum vulgare*, *Musa balbisiana*, *Ricinus communis*, *Ziziphus mauritiana*, and 1 species is rare i.e. *Ficus benghalensis*, and 1 species *Nelumbo nucifera* is threatened. The use of plant species as remedies is probably as ancient as men himself. The medicinal preparation has been practiced in day to day life of people living in villages. The use of ethno-medicine is wide spread in the study area with higher percentage of the tribal as well as non-tribal population relying on it. This is due to lack of awareness and lack of modern medical facilities available in the region and the high cost of medical system for treatment are unaffordable by villagers. Present study focuses

on the utilization of plants available with the people of the district Haridwar. They are using traditional knowledge as well as herbal remedies for the treatment of several diseases like amenorrhea, anemia, kidney stones, infertility, blood pressure, urinary complaints, swelling, tumor, skin diseases, wounds, cold and cough, arthritis, piles etc. It is hoped that the detailed observation on the traditional uses of plants in Ethno-medicine by the native people of this region will result in strengthening our knowledge and inspired to conserve the plant species. The study provides suffering ground to believe that the traditional using of plant is alive and well functioning in the study area, but there are requirement to conserve the plant species for their existence and human welfare.

Conclusion

The modern civilization is at high pedestals in the field of medicine and treatment to various ailments. Moreover, qualified allopathic practioners are not available to aborigines in the study area, thus these societies still use the traditional method for treatment of common ailments. In some case our modern science is not able to treat some of the chronic ailments and still depends upon indigenous system of medicine. Most of the traditional doctor (vaidhyas) who posses this traditional knowledge and wisdom are in old age. This precious knowledge will be lost irretrievably with the passing away of such people the traditional knowledge of

plants is therefore, very necessary for younger generation. Thus it is expected that this investigation will be helpful to conserve the heritable knowledge in the field of herbal treatment and general uses of plants.

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