



ISSN (E): 2320-3862
ISSN (P): 2394-0530
NAAS Rating: 3.53
www.plantsjournal.com
JMPS 2020; 8(6): 117-122
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Received: 17-09-2020
Accepted: 21-10-2020

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Ethno medicinal plants used for dental health care in Almora district, Uttarakhand

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Abstract

Oral diseases and dental disorders are major health problems in all over the world. The use of ethno-medicinal plants to treat dental problems has discussed previously by various researchers. Hence, the present study was done to explore the knowledge about medicinal plants used by locals of Lamgara region of Almora district. The present study include 27 plants used to cure various dental disorders such as toothache, tooth decay, pyorrhea, gingivitis, sore throat, mouth freshness etc. The present study includes 12 herbs, 6 shrubs and 9 trees belong to 17 families.

Keywords: Decoction, ethno medicinal, lesser Himalaya, oral health, toothache

Introduction

India has an enormous ecological diversity ranging from sea level to the highest mountains. It represents 2.4% of world's total geographical area with about 47,513 plant species. The total number of species of Angiosperms, Bryophytes, Pteridophytes, and Gymnosperms found in India are 18043, 2523, 1267 and 74 respectively [1]. In India, about 280 medicinal plants belonging to 79 families are used by pharmaceutical industries to prepare different formulation, of which about 175 medicinal plants are found in the Lesser Himalayan region of India [2].

Uttarakhand is well known for its herbal richness and great diversity. The state is also known as herbal state due to its herbal diversity. The Himalayan region is the treasure house of natural wealth particularly of medicinal and aromatic, timber producing plants [3, 4]. The plants are used by the traditional healers for the past many centuries to treat various ailments such as skin disorders, asthma, diabetes, snake bite, fever, pain, wound, and urinary tract disorders etc [5-7]. The present study aimed to explore the medicinal plants of Almora district of Uttarakhand, India used in the folk medicine to cure dental, oral problems. The study area of Almora district is situated in a mountainous hilly region, and having a large forest area of Pine, Oak, Rhododendron, kafal and various plants, herbs. Due to the population rise, inadequate supply of drugs, lack of medicinal facilities and side effects of allopathic drugs large segment of population is depend on ethno medicinal methods with the help of traditional healers, vaidyas [8].

Hollist (2004) [9] reported that about 10 different oral/dental conditions are treatable with plants in traditional health practices. More than half of the Malaysian aborigines (56.8%) used traditional medicine for relief of orofacial pain [9].

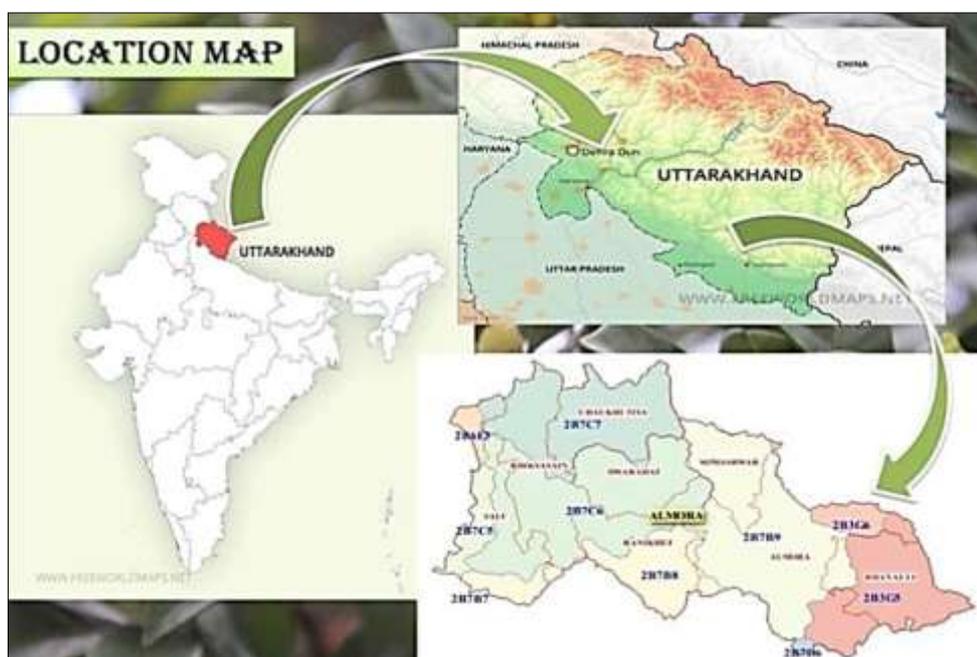
Ethno botanical and ubiquitous plants serve as a rich source of natural drug for research and development. A lot of research work has been carried out on the utilization of medicinal plants in the treatment of variety of ailments [10-12]. Plants produces chemicals as primary and secondary metabolites which have beneficial long-term health effect and also are used effectively to treat diseases. Specifically, it is the secondary metabolites that exert therapeutic actions in humans [13]. According to WHO report, over 80% of the world population relies on traditional medicine for their primary health care. The indigenous traditional knowledge of medicinal plants and therapies of various local communities has been lost due to changes in traditional culture and the introduction of modern technologies. Therefore, it is essential to explore the traditional knowledge of the indigenous medicinal plants mainly in such areas where there is a severe threat to natural vegetation owing to human inhabitation and over exploitation [5]. The present study aimed to explore the medicinal plants of Almora region, Uttarakhand, India used in the folk medicine for the management of dental problems by local persons.

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Oral diseases pose a major health problem for many countries and affect people throughout their lifetime, causing pain, discomfort, disfigurement and even death. The *Global Burden of Disease Study (2017)* estimated that oral diseases affect close to 3.5 billion people worldwide, with caries of permanent teeth being the most common condition. Globally, it is estimated that 2.3 billion people suffer from caries of permanent teeth and more than 530 million children suffer from caries of primary teeth. Some common dental problems are tooth decay, toothache, gingivitis, oral cancer, mouth sores etc. [14]. Unequal distribution of oral health professionals and a lack of appropriate health facilities in most countries mean that access to primary oral health services is often low. Overall, according to a survey of adults expressing a need for oral health services, access ranges from 35% in low-income countries to 60% in lower-middle-income countries, 75% in upper-middle income countries and 82% in high-income countries [15]. Due to lack of education and proper hygiene dental disease is most common problem among villagers. The village persons depend on traditional remedies to cure their problems due to lack of appropriate health facilities and dependence on local healers (Vaidyas).

Geography of study area

The study area of Almora is situated in the ridge of Kumaun Himalayas. It is 1,638 meters above sea level. The neighboring regions are Pithoragarh district to the east, Garhwal region to the west, Bageshwar district to the north and Nainital district to the south. Almora is situated in the latitude of 29°35'N to 29°60'N and in longitude of 79°39'E to 79°66'E. It covers 3697.2 km² geographical areas from which 1309.4km² area is covered by forests which involves moist deciduous forests and mixed coniferous forests. According to 2011 census the total population of area is 622,506 of which male and female were 291,081 and 331,425 respectively. The climate of Almora is warm and temperate. The summers here have a good deal of rainfall, while the winters have very little. The average temperature in Almora is 14.4 °C | 57.9 °F. About 1575 mm | 62.0 inch of precipitation falls annually. During summers the temperature rises from 14 to 28⁰ C while in winters the temperature falls down to 2⁰ C sometimes it goes down to freezing point or even below [16]. The Almora region consists of very deep well drained soils formed in a loamy mantle and sandy or gravelly outwash sediments.



Source: Topographic map.com

Fig 1: Location map of study area

Materials and Methods

The present study have done to determine the therapeutic methods used by traditional healers and vaidyas to cure various oral diseases. The study was conducted specially in villages of Lamgara block of Almora district.

The study included all forms of traditional healers that belong to and participate in regional activities. The information was collected through personal interview with traditional healers, local vaidyas and experienced persons of the area. The village persons have maintained a deep secrecy about their traditional knowledge, but after some subsequent visits they reveal their knowledge.

Procedure

The Study was fully based on personal interview with village persons. Meetings were conducted and purpose of the research was explained to them. Plant samples were requested

from traditional healers who could present plant sample and digital herbarium was prepared. The information about the plants and methods of use are collected by local vaidyas and with the help of various research papers [12, 17]. The plant samples were identified through various literatures and the internet sources (Flower of india.net, Wikipedia).

Result

A total of 25 traditional healers and vaidyas from 4 villages of Lamgara block participated in the present study. The majority were aged 45- 60. From which 17 are males and 8 are females. More than half had secondary education, one fourth had primary education and rest of the participants had informal education or illiterate. All of the participants resided in urban areas. The socio-demographic characters of the participants were described in Table 1.

Table 1: Socio-demographic characters of local healers

Characteristics	Male	Female	Total
Age (Years)			
<20	2	0	2
21-40	3	2	5
41-60	6	2	8
61-80	6	4	10
Educational attainment			
Informal/lliteral	2	5	7
Primary	4	2	6
Secondary	10	2	12

A total of 26 plants were identified, from which 12 are herbs, 6 are shrubs and 9 are trees. The plants belong to 17 families. The results were summarized in table 2, includes plant species

along with their local name, family, habit, disease treated, part used, method of administration and fig 1- 6.

Table 2: The plants belong to 17 families. The results were summarized in table 2.

S. No.	Scientific name	Common name	Family	Habit	Part used	Disease treated	Method of administration
1	<i>Zanthoxylum armatum</i>	Timur	Rutaceae	shrub	Stem, leaves, fruit	Toothache, pyorrhea	Young branches are used as tooth brush, powder of fruit placed on painful tooth
2	<i>Juglans regia</i>	Akhrot	Juglandaceae	Tree	Young stem	Tooth decay	Brushing with young stem
3	<i>Achyranthus aspera</i>	Saji/ Apamarja	Acanthaceae	Herb	stem	Tooth decay	Brushing with stem
4	<i>Magnifera indica</i>	Aam/ mango	Anacardiaceae	Tree	Bark, leaves, root	Toothache, pyorrhea	Gargling with decoction of bark or leaves.
5	<i>Allium sativum</i>	Lahsun	Alliaceae	Herb	Bulb	Tooth decay, cavity, toothache	Direct application of paste of bulbs
6	<i>Euphorbia royleana</i>	Khyun/ cactus	Euphorbiaceae	Herb	stem	Tooth cavity, tooth ache	Milky extract secreted by stem is directly applied on affected tooth
7	<i>Solanum xanthocarpum</i>	Kantkari	Solanaceae	Herb	Fruit, seed	Cavity	Seeds or powdered seeds are applied on affected tooth
8	<i>Ficus palmata</i>	Bedu	Moraceae	Tree	stem	Tooth decay, toothache	Milky extract secreted by stem is directly applied on affected tooth
9	<i>Artemisia nilagirica</i>	Pati	Asteraceae	Shrub	Leaves	Toothache	Decoction of leaves is directly applied, gargling also can be done
10	<i>Rubus ellipticus</i>	Hisalu	Rosaceae	Shrub	Root	Pyorrhea, tooth decay	Powder of root applied on affected tooth
11	<i>Azadirachta indica</i>	Neem	Meliaceae	Tree	Leaves, stem	Tooth decay, gingivitis, pyorrhea, mouth freshness	Young stem used as tooth brush, fruits, leaves taken directly for mouth freshness
12	<i>Aegle marmelos</i>	Bel	Rutaceae	Tree	Leaves, fruit	Toothache	gargling
13	<i>Aloe barbadensis</i>	Aloevera	Asphodelaceae	Herb	Leaves	Gingivitis, mouth ulcers	Jel applied directly on affected tooth, rubbing
14	<i>Citrus limon</i>	Nimbu	Rutaceae	tree	Root	Gingivitis, toothache	Gargling with decoction of leaves, root
15	<i>Coleus blumei</i>	Coleus	Lamiaceae	herb	Leaves	Sore mouth/ toothache	Brushing with paste prepared by leaves
16	<i>Tagetes erecta</i>	Genda/ hajari	Asteraceae	herb	Leaves	Cavity	Paste of leaves applied on painful tooth
17	<i>Psidium guajava</i>	Amrud/ guava	Myrtaceae	Tree	Leaves	Toothache/ mouth ulcer	Paste of leaves applied on painful tooth
18	<i>Chenopodium ambrasiodes</i>	_	Amaranthaceae	Herb	Whole plant	Toothache	Paste prepared of whole plant is placed on painful tooth
19	<i>Nicotiana tabacum</i>	Tabacoo	Solanaceae	Herb	Leaves	Toothache, cavity	Powder or paste prepared by leaf applied directly on affected tooth
20	<i>Allium cepa</i>	Pyaj/ onion	Alliaceae	Herb	Leaves, bulbs	Sore throat, toothache,	Applied directly for toothache, gargling for sore throat
21	<i>Gossypium arboreum</i>	Cotton	Malvaceae	Shrub	Leaves	Tooth extraction	Gargling should be done with hot decoction
22	<i>Eucalyptus saligna</i>	Eucalyptus	Myrtaceae	Tree	Leaves	Toothache, halitosis	Paste or decoction of leaves used for gargling
23	<i>Jatropha curcas</i>	Pahari arand	Euphorbiaceae	Shrub	Leaves	Gingivitis	Twigs are used as toothbrush, paste/ decoction of leaves used in gingivitis
24	<i>Ricinus communis</i>	Castor bean	Euphorbiaceae	Shrub	Leaves	Toothache	Gargling
25	<i>Ocimum basilicum</i>	tulsi	Lamiaceae	Herb	Seed, leaves, stem	Mouth freshness, toothache,	Leaves taken directly for mouth freshness, stem used as toothbrush
27	<i>Musa cavendishii</i>	Banana	Musaceae	Tree	Roots	Sore throat	Solution, decoction of root is drinkable, gargling also can be done

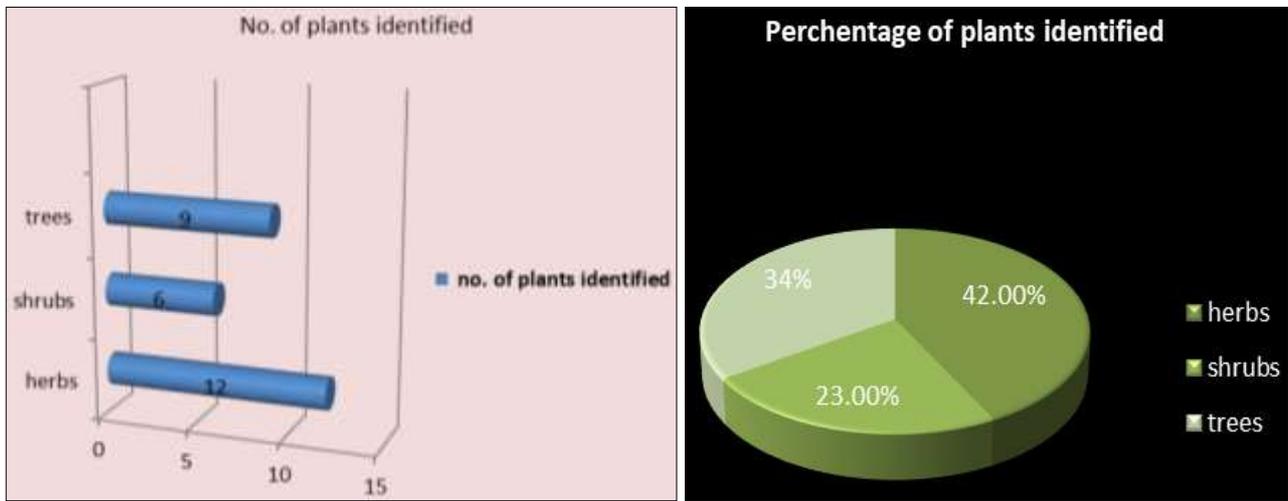


Fig 1: No. of herb, shrub and trees identified from the region

The present study includes 27 plants in total among which 9 were trees, 6 were shrubs and 12 were herbs.

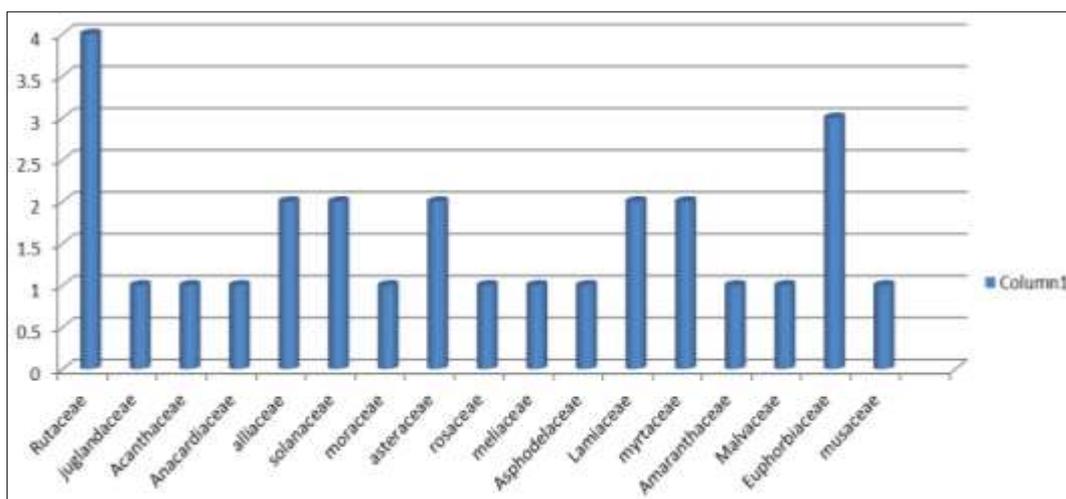


Fig 2: Dominant families of ethno-medicinal plants identified from the region

Out of 17 families the most dominant family used in treatment of various dental problems is of Rutaceae comprising of 4

species followed by Euphorbiaceae comprising of 3 species of ethno- medicinal plants.

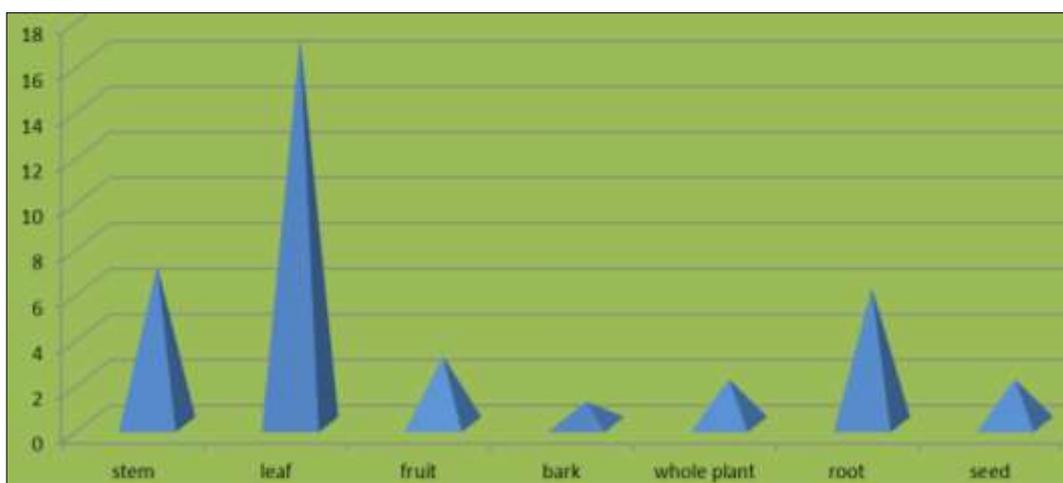


Fig 3: No. of plant part used in various dental disorders

In terms of utilization of ethno-medicinal plants the leaves used in maximum number of cases with the total of 17 plants. The stem is used in 7 plants, roots are used in 6 species, fruit is used in 3 species, seed is used in 2 species and bark and

whole plant is used only in 1 species. (Fig 3) It has been recorded that the methods of utilization of plant parts and also methods of administration are different among various local communities.

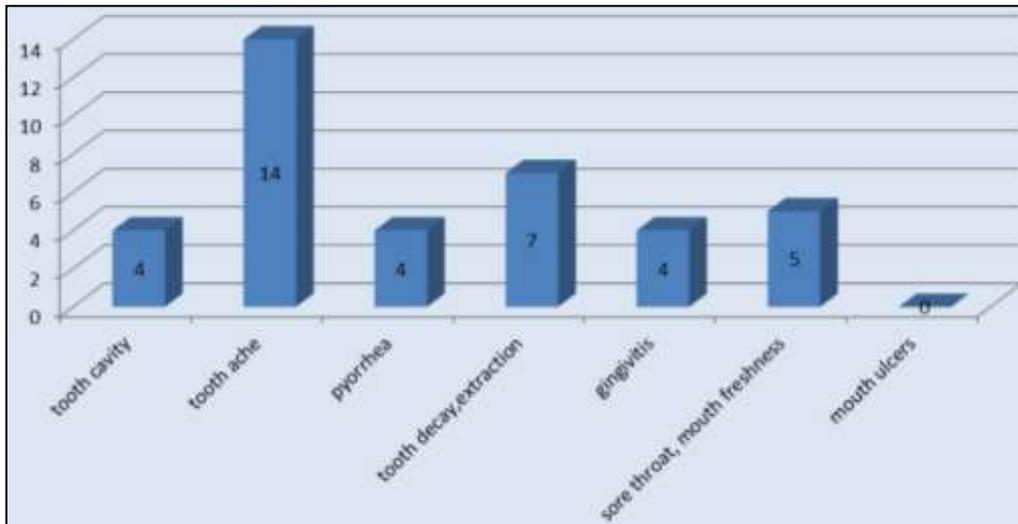


Fig 4: Various diseases treated with ethno-medicinal plants

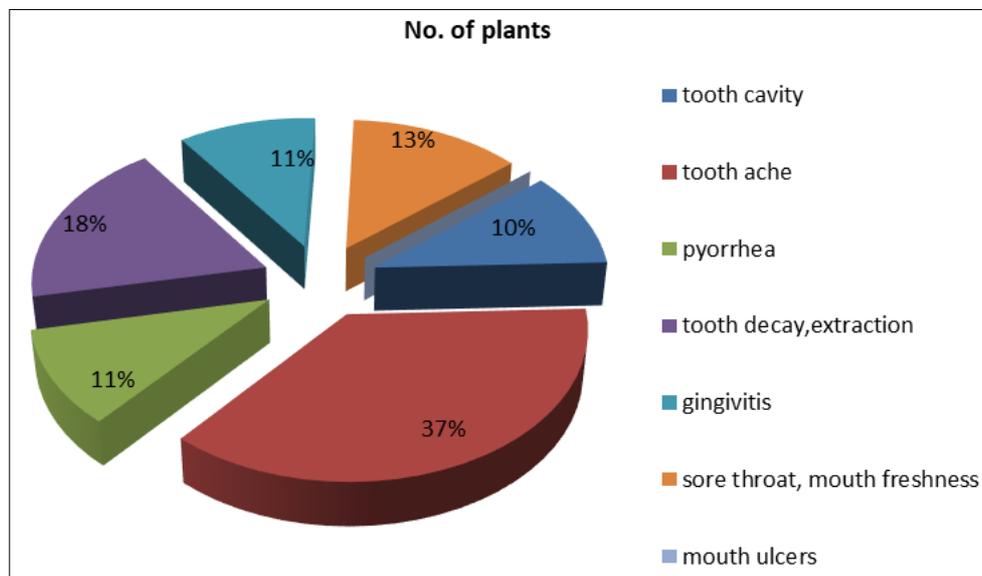


Fig 5: Percentage of various diseases treated with ethno-medicinal plants

The plant species are used to cure various dental problems such as tooth ache, tooth decay, gingivitis, sore throat, pyorrhea, mouth freshness, mouth ulcers and tooth extraction.

Discussion

A maximum of 14 species used to cure toothache, 7 species are used in tooth decay and tooth extraction. The use of some of the ethno-medicinal plants was also reported by various workers¹⁸. The use of *Gossypium arboreum* (cotton) and *Musa carvendishii* in dental disorders were also reported by workers¹². Young stems or branches of 5 species are directly used as toothbrush by local residents such as *Magnifera indica*, *Ocimum basilicum*, *Azadirachta indica*^[18-21].

Out of 27 plant species *Zanthophyllum armatum*, *Juglans regia*, *Magnifera indica*, *Allium sativum*, *Azadirachta indica*, *Psidium guajava* are previously reported as oral care by

various communities in India and all over the world^[9, 22, 23]. While 7 plant species such as *Achyranthus indica*, *Euphorbia royleana*, *Solanum xanthocarpum*, *Ficus palmate*, *Artemisia nilgirica*, *Tagetes erecta*, *Chenopodium ambrasiodes* were found to specifically used by local peoples of Almora region, therefore there is an urgent need of proper documentation of traditional knowledge from various tribal communities and local healers. Such studies will help in understanding how local communities relate to the plant resources and this ethno-botanical knowledge of medicinal plants needs to be preserved for future generation. Thus the present documentation of medicinal plants from Lamgara block of Almora district provide recognition to the existing knowledge and also help in conservation of important medicinal plants for the betterment of the society.

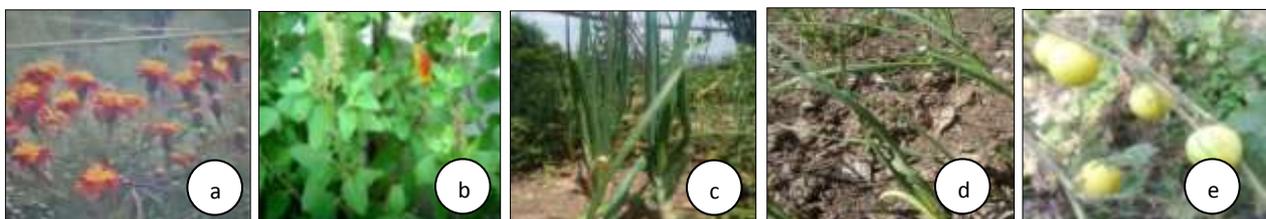




Fig 6: (a) *Tagetes erecta* (b) *Ocimum basilicum* (c) *Allium cepa* (d) *Allium sativum* (e) *Solanum xanthocarpum* (f) *Citrus limon* (g) *Ficus palmate* (h) *Artemisia nilagirica* (i) *Chenopodium ambrosioides* (j) *Aloe barbedensis*

Conclusion

A survey was conducted in Lamgara block of Almora district of Lesser Himalayan region for identification of plants used for dental care by local healers (Vaidyas) residing in the villages. A total of 27 plants were identified and herbarium was prepared and submitted in Department of Botany, S.S.J Campus Almora. Out of which 12 plant species are herbs and 6 species are shrubs and 9 are trees species, belongs to 17 families.

Acknowledgement

The authors are thankful to the Head, Department of Botany, Kumaun University, S.S.J Campus Almora for providing necessary laboratory facilities and local healers of Lamgara block of Almora district for sharing their valuable traditional knowledge.

References

- Chapman AD. No. of living species in Australia and the world, 2nd edn. Australian government, Dept. of the environment, water, heritage and the arts 2009.
- Dhar U, Rawal RS, Upreti J. Setting priorities for conservation of medicinal plants- A case study of Indian Himalayas, *Biological Conservation* 2000;95:57-65.
- Kumari P, Singh BK, Joshi GC, Tewari LM. Veterinary Ethno medicinal Plants in Uttarakhand Himalayan Region, *Ethno botanical leaflets* 2009;13:1312-27.
- Arya KR, Mishra DK. Anti- arthritic and anti- rheumatic plants of Almora and Bageshwar districts in Kumaun Region of Uttarakhand, India, *Journal of medicinal and aromatic plant sciences* 2010;32:262-267.
- Kumar A, Aswal, Chauhan A, Semwal RB, Kumar A, Semwal DK. Ethno medicinal investigation of medicinal plants of Chakrata region (UK) used in the traditional medicine for diabetes by Jaunsari tribe, *Springer.com* 2019;9:175-200.
- Tiwari H, Upadhyaya M. Ethno medicinal herbs of Almora, Uttarakhand, *Asia pacific Journal of research* 2020;1:58-65.
- Thakur S, Tashi N, Singh B, Dutt HC, Singh B. Ethno botanical plants used for gastrointestinal ailments by the inhabitants of Kishtwar plateau in northwestern Himalaya, India, *Indian journal of traditional knowledge* 2020;19(2):288-298.
- Arya D, Khan AH, Adhikari M. Plant species used by locals as ethno-medicine in kumaun region of western Himalaya (India), *Int. journal of pharmaceutical sciences and research* 2014, P3128-3132.
- Hollist NO. A collection of traditional Yoruba oral and dental medicaments, Ibadan book builders.
- Jain SK, Saklani A. Observations on Ethno-botany of the Tons Valley Region of Uttarkashi District of North-West Himalayas, *Mountain Res. Dev* 2004;1:177-183.
- Singh A, Nautiyal MC, Kunwar RM, Bussman RW. Ethno-medicinal plants used by local inhabitants of Jakholi block, Rudraprayag district, Western Himalayas, India, *Journal of ethno botany and ethno medicine* 2017, P13.
- Kumar R, Arya D, Chandra Sekhar K. Diversity, utilization patterns and conservation of ethno medicinal plants in pindari valley, Uttarakhand Himalaya; *Asia Pacific Journal of Research* 2020;1:1-11.
- Agbor MA, Naidoo S. Ethno medicinal plants used by traditional healers to treat oral health problems in Cameroon, *Evidence based complementary and alternative medicine* 2015.
- Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 2018;392:1789-8583.
- Hossienpoor AR, Itani L, Peterson PE. Socio economic inequality in oral healthcare coverage results from the world health survey, *J Dent Res* 2012;91(3):275-281. Climate.org.in
- Samant SS, Dhar U, Palni LMS. Medicinal Plants of Indian Himalaya: Diversity Distribution and Potential Value; Gyanodaya Prakashan, Nainital 1998.
- Diwan PD, Gadhikar YA, Jain SB. Traditional Ethnomedicinal plants used for oral health care by tribals of Melghat Region, Distt Amaravati (M.S.), India, *Int. J Pharm. Sci* 2013;21(1):301-304.
- Singh H, Krishna G, Baske PK. Ethno medicinal plants used for dental care in Sundargarh, Mayurbhanj, Angul and Balangir districts of Odisha, India, *Indian journal of National products Resources* 2013;4(4):419-424.
- Mussarat S, Abdel-Salam N, Jariq A, Wazir SM, Ullah R, Adnan M. Use of Ethno medicinal plants by the people living around Indus River, *Evidence-based complementary and alternative Medicine* 2014.
- Khandare MS, Mango (*Mangifera indica*). A medicinal and holy plant, *Journal of medicinal plant studies* 2010;4(4):44-46.
- Kala CP, Farooquee NA, Dhar U. Traditional uses and conservation of Timur (*Zanthoxylum armatum*) through social institutions in Uttaranchal, Himalaya, India, *Conservation & society* 2005;3(1):224-230.
- Rosa MPG, Mitchell S, Vargas S. *Psidium Guajava*: A review of its traditional uses, phytochemistry and pharmacology, *Journal of ethno pharmacology* 2008;117:1-27.