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Ethnobotanical Knowledge and Market Value of Medicinal and Aromatic Plants in Joshimath Block of Chamoli Uttarakhand, India

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Abstract

The present study has been carried out during 2021 to 2022 in Joshimath block of district Chamoli, Uttarakhand, India to document the ethnomedicinal uses of medicinal and aromatic plants and their marketing patterns. Of 54 plant species, 47 herb, 4 shrubs, and 3 trees specieswere used for curing a total 21 diseases such as fever, rheumatism, jaundice, intestinal problems etc. Rhizome/tuber/roots (34.48%), followed by leaves (20.68%), fruits/seeds (17.24%), whole plant (6.89%), flower (5.17%), stem/bark (5.17%), root and leaf (5.17%), leaves and flower (1.72%), leaves and stem (1.72%), root and fruit (1.72%) were used for curing different ailments.A total 13 MAPs and 5 MAPs products were recorded in use and marketed during the survey.The maximum retail price (Rs 2000/Kg) was observed in *Potentilla fulgens* whereas, the minimum retail prize (Rs 125/Kg) was observed in *Saussureacostus* . Oil of *Rosa damascena* had maximum retail price (Rs 7000-8000/Litter) and the minimum retail price (Rs 210/L) was observed in Rose water . Among 54 medicinal plants, 6 species were critically endangered, 7 endangered, 6 near threatened, and 5 vulnerable species showed high demand in the market and greater potential towards curing of different ailments.

Keywords: Medicinal plant, ethnobotany, market value, Garhwal Himalaya

1. Introduction

Plant based resources have remain an integral part of human society throughout history. Man had been depended upon plants since ancient time. They fulfill the basic needs of human beings like food, cloths, shelter and medicine (Anonymous2002). Medicinal plants are essential and rich sources of efficient and safe medicines. They play a vigorous role in the formulation and development of new drugs as well as traditional herbal system (Russellet al., 2006).

India has a rich heritage of herbal medicines and an ethnomedicinal tradition which has developed into an established scientific faculty dealing in plants-based Medicare (Singh et al., 2005; Mahapatra and Panda, 2002; Uniyal et al., 2002). India is known for its traditional medicinal systems viz, Ayurveda, Unani and Siddha commonly known as Indian system of medicine a large number of treaties recognized on system of medicine. The Ayurvedic systems of medicine, which provide to the health needs of a major segments of inhabitantspresently consume as 1000 single drugs and over 8000 compounds of formulations of recognized merit. Other systems of medicines viz, Siddha, Unani and Tibetan systems of medicines together utilize about 1800–1900 medicinal plant species. (Peter, 2007).

The Himalayan region shows great diversity in vegetation with 21 forest types and more than 18,440 species of plants (Singh and Hajra, 1996). Among these plant species, 1,748 species are medicinal plants including 118 species of essential oil yielding medicinal plants (Samant et al., 1998). It also contributes to a large percentage of crude drugs in the Indian and global market. The ethnobotanical species also comprise economical, nutritional, aesthetic, cultural as well the sacred value and are an important part of life and livelihood of the indigenous Himalayan communities (Samant et al., 1998; Maikhuriet al., 1998).

Uttarakhand is a part of North-Western Himalayas with rich in vegetation wealth, which comprises of animmense range of important medicinal plants in the natural conditions. There are also huge opportunity and prospects to cultivation of these important medicinal and Aromatic plants (Singh et al.,

2005). Sudden rise in the demand of herbal products recent years and plant-based drugs across the world resulting in the heavy exploitation to meet the demands, illegal trade in medicinal plants have already led to the extinction of more than 150 plant species in the wild (Singh and Rawat, 2011). Uttarakhand declared as herbal state and the government has formulated the strategies for cultivation and marketing of medicinal plants (Singh et al., 2005, Kuniyal et al., 2014).

The collection and marketing of medicinal and aromatic plants provides an important source of income for communities living in rural areas. Medicinal and aromatic plants are traded both as raw materials and as processed finished products. Demand for varieties of species is increasing day by day as more and more people are turning towards Ayurvedic treatment for complex ailments. The WHO estimates that by 2050 the trade of medicinal plants will be up to USD $ 5 Trillion globally (Pangriya, 2015).

Medicinal plants, traditionally established as a major source of curing diseases, at present, not only use in curing various ailments but also offer a wide range of subsistence and monetary benefits to the people across the world (Anonymous, 2003; Kala, 2005). Recent past witnessed the substantial growth in the herbal product's market. According to the World Health Organization, 30% of the drugs sold worldwide contain compounds derived from plant material. The world trade figures suggest that India is next to China as it exports 32,600 tons of medicinal raw material worth US$ 46 million annually (Lange, 1997). The exponential growth in human population, unemployment, desire to earn more money, and increasing acceptability of herbal medicine are among few stimulating factors for rising trade in medicinal plants (Kala, 2003).

2. Materials and Methods

The present study was conducted during 2021 to 2022 in Joshimath block of Chamoli district of Uttarakhand with latitude and longitude of 30º33'1.9872" N and 79º33'57.4704" E. Total area of Joshimath block is 3,883 km² and the block has 95 villages. The study area covers an altitudinal range from 1500–4500 m asl. The region has very rich diversity of medicinal and aromatic Plants species with both temperate to and sub alpine forests.

The survey was conduct on September 2020 to September 2021 with a view to study medicinal plants, ethnomedicinal importance and their marketing. Ethnobotanical and marketing data may be collected in different manners i.e. by enquiry, observation, interview and participation. The methodology used for collection the information was put into following three major categories: -

• *Direct Approach*: This included the intensive field surveys among tribal and remote areas of a region.

• *Indirect Approach*: It included collection of information from literature, museums, herbarium etc.

• *Miscellaneous:* Some information was also collected after discussion with the non- tribal e.g. village headman, spiritual leader, social workers, forest officers etc.

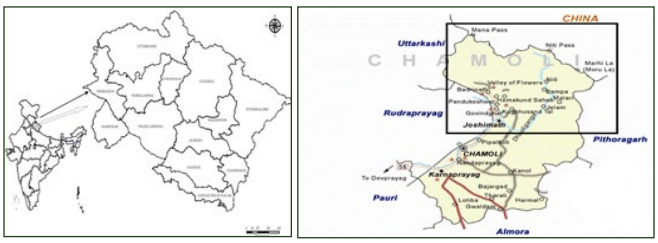

Figure 1: Location map of study area

3. Results and Discussion

This study is based on an ethno-medicinal survey of MAPs and their marketing within the 13 villages of Joshimath block from June to September in the year 2020–2021. The villages of study area are named Gamsali, Bampa, Farkiya, Malari, Tolma, Reni, Badagaon, Merag, Auli lagaJohimath, Saloor Dungra, Pandukeshwar, Pulana, and Mana. Most of the villages dominated by the Bhotiya community. Among the various life forms of medicinal plant species found in the study area, herbs are the most dominant, as out of 54 medicinal plant species, 47 was herbs, 4 was shrubs and 3 was trees species. A total of 54 plant species belonging to 27 families were documented to be used in treating various ailments by local inhabitants. Maximum recorded species belongs to the family Asteraceae (9 spices), followed by the family Polygonaceae (6 species), Apiaceae (5 spices), Lamiaceae (5 species), Ranunculaceae (3 species), Alliaceae (2 species), Berberdiaceae (2species), Liliaceae (2 species), Zingiberaceae (2 species) and the remaining 18 families were represented by one species each (Table 1). Commonly used plant parts were root (34.48%), followed by leaves (20.68%), fruit (17.24%), whole plant (6.89%) and stem (5.17%) for curing different human ailments. There are some plants whose root and leaves (5.17%) are used, some plants are those whose leaves and flower (1.72%) are used, some plants are those whose leaves and stem (1.72%) are used and some plants are those whose root and fruit (1.72%) is used (Figure 2).

Various plants are used to cure different diseases. The type of ailments treated by the local inhabitant indicates most of them are of common and simple ones. Out of 54 plants recorded in the present study, 12.30% were reported to cure fever followed by cold and cough 10.76%, stomach disorder 10%, cut and wounds 9.23%, rheumatism 8.46%, gastrointestinal problem 6.92%, diarrhoea 6.15%, jaundice 6.15%, sexual dysfunction 4.61%, respiratory disorder 3.84%, kidney disorder 3.07%, bronchitis 3.07%, toothache, liver disorder, blood purification, headache, skin disease (2.30% plants for each disease), internal injury 1.53%, baldness, anemia and menstrual disorder (0.76% plants for each disease).

3.1. Status of plants

Out of 54 species studies here, 24 plant species encountered

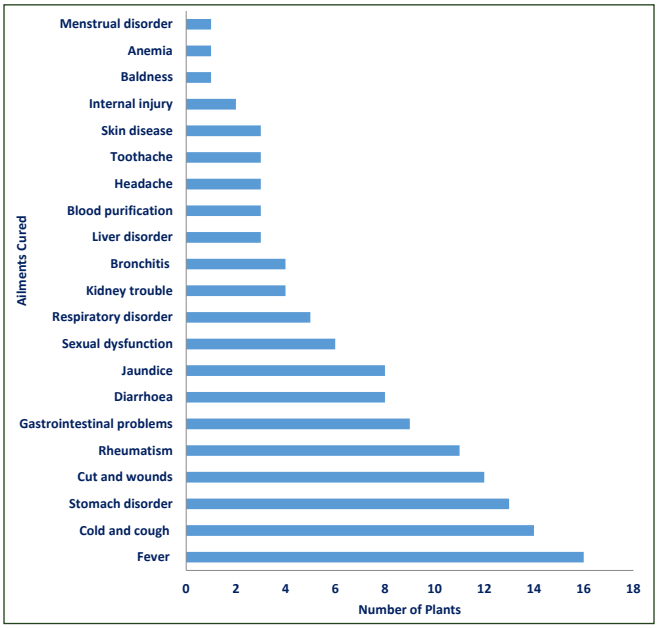

Figure 2: Medicinal plants used for different ailments by local inhabitants

have been classified as, critically endangered, endangered, near threatened, vulnerable and data deficient. *Aconitum heterophyllum*, *Nardostachys jatamansi*, *Saussurea costos* (Gopi et al., 2018), *Aconitum balfouri*,*Arnebia benthamii* and *Dactylorhiza hatagirea* (Jaiyati et al., 2016) have been reported as critically endangered. *Allium humile, Angelica glacua*, ,*Picrorhiza kurrooa*, *Podophyllum hexandrum*,*Rheum emodi*, *Saussurea obvallata* and *Taxus baccata* (Jaiyati et al., 2016) have been reported as endangered. *Berginia ciliata*, *Paeonia emodi*, *Berberis aristata* (Jaiyati et al., 2016), *Betula utilis*,*Hippophae salicifolia* and *Rheum moorcroftianum* (Kumar et al., 2015) have been reported as near threatened. *Acorus calmaus*(Gopi et al. 2018), *Allium stracheyi*, *Polygonatum veticillatum* (Kumar et al., 2015), *Hedychium spicatum* (Butola and Badola, 2008), and *Swertia chirayita* (Nautiyal and Nautiyal, 2004) have been reported as vulnerable.

The Bhotiya communities of the study area possess the immense knowledge of traditional plant species and used 30 medicinal plant species belonging 18 families for curing 48 different kinds of ailments. The medicinal plants, used in traditional health care system are categorized into

Table 1: Ethnomedicinal uses of medicinal and aromatic plants species in Study area

Sl. No.	Botanical name	Local name	Family	Status	Part used	Disease cured	Method of uses
1	*Aconitum balfourii* Stapf.	Meetha, Bish	Ranunculaceae	CR	Tuber	Rheumatism	Paste of tuber with ghee apply in joint pains.
2	*Aconitum heterophyllum* Wall.	Atees	Ranunculaceae	CR	Tuber	Fever, cold, diarrhea, piles wound healing	Paste of dries tuber mixed with water.
3	*Acorus calmaus* L.	Vach	Araceae	VU	Rizome	fever, brochitis, rheumatism and diarrhoes	Rhizome paste given orally
4	*Allium humile* Kunth	Faran	Alliaceae	EN	Bulb and leaf	Jaundice, cold and cough	Dried leaves and bulbs are taken orally
5	*Allium stracheyi* Baker	Jambu faran	Alliaceae	VU	Bulb and leaf	Jaundice, cold and cough	Decoction of leaves paste mixed with honey
6	*Anemone rivularis* Buch.-Ham.	Kakad phool	Ranunculaceae		Root and leaf	Cuts and wounds	Leaf paste applied on cut and wounds
7	*Angelica glacua* Edgew.	Choru	Apiaceae	EN	Root	Stomach disorder, diarrhea, bronchitis cold and cough	Roots powder is given orally with warm water
8	*Arnebia benthamii* (Wall. Ex G.Don)	Bal chadi	Boraginaceae	CR	Root	Asthma, fever and hair fall	Root paste is given orally and root kept with musturd oil and applied in hair
9	*Artemisia vulgaris* Linn.	Kunj	Asteraceae		Leaf, root	Stomach disorder, Fever, rheumatism, jaundice, wounds	The leaves are used fresh. Dried root powder is used in epilepsy.

Table 1: Continue...

Sl. No.	Botanical name	Local name	Family	Status	Part used	Disease cured	Method of uses
10	*Aster albescens* (DC.) Wall.ex Hand.- Mazz.	Lilac Himalayan Aster	Asteraceae		Leaf	Cut and wounds	Leaf paste is applied on wounds
11	*Berberis aristata* DC.	Kingod	Berberidaceae	NT	Root and fruit	Indigestion, tiredness and eye flu	Juice and extract are given orally
12	*Berginia ciliata* (Haw.) Sternb.	Silpadu	Saxifragaceae	NT	Rizhome	Kidney stone and ache	The rizomes is used in dried powderd form or fresh too.
13	*Betula utilis* D. Don	Bhojpatra	Betulaceae	NT	Bark	Rheumatism, cuts and wounds	Paste is applied on wounds and muscles
14	*Carum carvi* L.	Kala zeera	Apiaceae		Seed	Fever, stomach problems, Sexual dysfunction	Seeds are used as spice and roast seed is eaten with salt
15	*Cannabis sativa* Linn.	Bhang	Cannabaceae		Seed and leaf	Bronchitis, fever indigestion and impotence	Roasted seeds are used with foods and leaves are consumed with smoke
16	*Curcuma longa* L.	Haldi	Zingiberaceae		Rhizome	Digestion, improve liver function	Rhizome powder used as spices, & also taken orally with milk
17	*Cyananthus lobatus* Wall. ex Benth.	Trailing Balliflower	Campanulaceae		Root and flower	Constipation disorders and ulcers.	Root and flower decoction taken orally
18	*Dactylorhiza hatagirea* (D.DON) Soo	Hatha jadi	Orchidaceae	CR	Tuber	Diarrhea, external wounds and sexual dysfunction	Powder of tuber with warm water or milk is given orally and paste is applied on the wounds.
19	*Fagopyrum tataricum* Menth	Phaphar	Polygonaceae		Seed	Fever, headache and colic pain	Decotion of grains
20	*Foeniculum vulgare* Mill.	Fennel, Saunf	Apiaceae		Seed	Bronchitis, coughs and intestinal gas	Seeds are given orally with warm water
21	*Erigeron multiradiatus* (Lindl. Ex DC.) Benth. Ex C.B. Clarke	Rayhanda	Asteraceae		Root and leaf	Renal disorder and stomachache.	Leaf and root paste taken orally
22	*Hedychium spicatum* Sm .in A. Rees	Kapoor kachri	Zingiberaceae	VU	Rhizome	Asthma and bronchitis	Rhizome extract is taken orally with milk
23	*Heracleum wallichii* DC.	Chimphing	Apiaceae		Fruit	sexual dysfunction, liver disorder, skin disease jaundice, cuts and wounds	concentrate decoction of the fruit juice is taken orally and stem bark is applied on cuts and wounds
24	*Hippohae salicifolia* D. Don	Amesh, Badriphal	Elaeagnaceae	NT	Fruit	Blood purification, diarrhea, liver disorder, sexual dysfunction	Fruit jucie is given orally

Table 1: Continue...

Sl. No.	Botanical name	Local name	Family	Status	Part used	Disease cured	Method of uses
25	*Geranium wallichianum* Oliv.	Laljar	Geraniaceae		Root and leaf	Bleeding, clot peptic ulcers, toothache, rheumatic pain	Leaf paste is applied in wounds and root paste taken orally
26	*Inula grandiflora* Willd.	Showy Inula	Asteraceae		Root and leaf	Diabites, fever and bronchitis	Root paste is taken with milk
27	*Nardostachys jatamansi* (D. Don) DC.	Masi, Jatamansi	Valerianaceae	CR	Root	Blood purification, stomach disorder, internal pain and jaundice	Powder of rhizomes is taken with warm water
28	*Mentha longifolia* (L.) Huds.	Jungli pudina	Lamiaceae		Leaf	Dehydration, cough, vomiting, liver diseases	Extract is given orally
29	*Morina longifolia* Wall. ex DC.	Bishkandaru	Dipsacaceae		Root	Boils, snakebite and wounds	Root paste is applied on the skin
30	*Origanum vulgare* L.	Ban tulsi	Lamiaceae		Leaf and seed	Rheumatism, headache and fever	Leaf paste is applied on skin and leaves are used for making local tea
31	*Paeonia emodi* Wall. ex Royle	Chandra	Paeoniaceae	NT	Root and leaf	Diarrhea, cold and cough	Leaves used as vegetable and root decotion used in intestinal pain
32	*Perilla frutescens* (L.) Britton	Bhangzeera	Lamiaceae		Seed	Digestive disorder	Seed paste is given with warm water
33	*Picrorhiza kurrooa* Royle ex Benth.	Kutki, Kadwi	Scrophulariaceae	EN	Root	Abdominal pains, fever, jaundice, stomach disorder	Roots are boiled with water and drink.
34	*Podophyllum hexandrum* Royle.	Ban kakri	Berberidaceae	EN	Root and fruit	Skin disease, wounds and stomach disorder	Root paste is taken or applied externally
35	*Polygonatum veticillatum* (L.) All.	Maha maida	Liliaceae	VU	Tuber	Kidney trouble and weakness	Extract or paste is given orally
36	*Polygonam affinis* (D. Don) Greene	Chookroo, Maasloon	Polygonaceae		Root and leaf	Diarrhoea and cold	Leaf and root paste given orally

Table 1: Continue...

Sl. No.	Botanical name	Local name	Family	Status	Part used	Disease cured	Method of uses
37	*Polygonam polystachym* Wall.	Ama–Haldu, Durfu,	Polygonaceae		Leaf	Cut and wounds	Leaf paste applied on cut and wounds
38	*Polygonam vivipara* (L.) S.F. Gray	Ban mundu	Polygonaceae		Root and seed	Blood dysentery	Roots are chewed and fried seeds eat orally
39	*Potentilla fulgens* Wall.ex HK.	Bajradanti	Rosaceae		Root and leaf	Toothache	Root and leaf paste is useful
40	*Rheum emodi* Wall.	Dolu	Polygonaceae	EN	Root	Internal injury, cold, disease, wound, pain and dysentery	Paste is applied on the skin and given orally
41	*Rheum moorcroftianum* Royle.	Archa	Polygonaceae	NT	Root	Internal injury, cold and cough	Root paste is given orally
42	*Rosmarinus officinalis* Spenn.	Rosemary	Lamiaceae		Leaf	Blood circulation, immune system and memory performance	Tea of leavesboost immune system, improve blood ciruculation and improve memory performance and quality.
43	*Rumex nepalensis* Spreng.	Payoom	Polygonaceae		Root and leaf	Hepatitis, rheumatism	The root are used dried or fresh and decoction of leaves is used
44	*Saussurea costos* (Falc.) Lipsch.	Kuth	Asteraceae	CR	Tuber	Pain, fever, asthma, and cough.	Tuber paste is given orally
45	*Saussurea obvallata* (DC.) Edgew.	Brahm kamal, Kaul	Asteraceae	EN	Flower	cuts and wounds, rheumatism	Flower buds are made into paste
46	*Selinum coniifolium* (Wall. Ex DC.)	Bhut keshi	Apiaceae		Root	Skin disease, stomach disorder and respiratory disorder	Root paste is applied on the skin and root decoction is for drink
47	*Solidago virgaurea* L.	Pinja phool, Sonali	Asteraceae		Root and leaf	Asthma, rhuematism, cuts and wounds, kidney disorders and throat infections.	Root and leaves are applied and taken orally
48	*Swertia chirayita* Karsten	Chirayata	Gentianceae	VU	Leaf	Malaria fever and blood purifier	Plant decoction taken in fever
49	*Tagetus minuta* L.	Wild marigold	Asteraceae		Leaf and flower	Stomach pain, intestinal worms, cold and cough	Leaves are used as tea
50	*Taxus baccata* L.	Thuner	Taxaceae	EN	Leaf and bark	Headache, internal wounds and rheumatism	Bark paste is applied as a plaster on fractured bone, also applied externally on the forehead to provide relief from headache

Table 1: Continue...

Sl. No.	Botanical name	Local name	Family	Status	Part used	Disease cured	Method of uses
51	*Thymus linearis* Benth.	Mirchi ghas	Lamiaceae		Leaf and flower	Cough and fever	Leaves & flower used as condiment and in green tea
52	*Trillidium govanianum* Wall. ex D. Don	Nag chhattri	Lilliaceae		Root	Menstrual disorder and stomach disorder	Root paste taken orally with warm water
53	*Urtica dioca* L	Kandali, Bichho ghas	Urticaceae		Leaf	Arthritis, gout and anemia	Leaf paste taken orally
54	Zanthoxylum armatum DC.	Timru	Rutaceae		Stem	Pyorrhea, toothache and wound filling	The tender branches are used as toothbrushes and thorns as an application in toothache

R: Rare, CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near Threatened

underground parts (61%), leaves (20%), flower (8%), seeds (5%), fruits (4%), bark (0.62%), and whole plant (1.482%) as per their parts used. These medicinal plant species collected from high altitude forests in a particular season/time for curing a variety of ailments. (Maletha et al., 2016).

Kandari et al., 2012 revealed that out of 50 plants recorded in the study, 16 were reported to cure rheumatism followed by stomach ache (14), cold and cough (11) and jaundice (4). Thirty-three plants were found to be used for curing more than one ailment, while 17 species were reported to having only a single therapeutic application. Another survey was conducted in Joshimath block which reported 53 medicinal plants used to cure several ailments such as stomach ache, fever, cough, diarrhea, dysentery, kidney problems, pain, wounds, cuts, insecticides, eye diseases, stop bleeding, abdomen pain, indigestion antiseptic, healing foot cracks, mouthwash, blood diseases etc. Root powder and extract of *Aconitum heterophyllum*, *Picrorhizakurroa* and leaf of *Swertia chirayita*are useful against fever, *Rheum tibeticumare* used for pain and hidden wounds, leaves of *Thymus serpyllum*, *Origanum vulgare* are used for cold and cough, *Zanthoxylum armatim* for dental decay and pyorrhea and gum bleeding, Berberis species were used for jaundice and *Urtica dioica* is beneficial for sprain and low blood level, *Dactyrorrhiza* and *Ophiocordicepts* are used as rivitality (Bisht 2017; Kumar and Negi, 2019).

According to IUCN 2012 and different reports 24 plant species encountered have been classified as, critically endangered, endangered, near threatened, vulnerable and data deficient in Joshimath block. Similar investigations reveal that 41% of the documented plant species in the study area are threatened. Of the 20 threatened plant species, 14 are endangered, 3 critically endangered, 2 vulnerable and 1 species are Rare as per the IUCN threat assessment. The critically endangered species are *Nardostachys jatamansi, Swertia chirayita and Picrorhiza kurrooa* (Maletha et al., 2016). Remoteness and easy availability and access from the wild are considered the main reason for the decline in medicinal plant population in their natural habitat (Phondaniet al., 2010, Bisht, 2017). Due to anthropogenic pressure and illegal harvesting in Niti valley, MAPs density is getting low as compared to other areas in the Himalaya (Bisht, 2005, Nautiyal et al., 2005). Uncontrolled developmental activities are causing a great loss to the biodiversity in the Indian Himalayan region, where medicinal plants in particular are declining at a very fast rate due to their over exploitation for trade (Samant et al., 2007).

A total of 54 medicinal and aromatic plants were documented during the marketing survey and 13 species and their products are used for marking purpose. Different plant parts of these species such as root, leaf, stem, bark and seeds were sold by the local inhabitants. The dried roots of *Potentilla fulgens* Wall.ex HK. had the highest retail price (₹ 2000/kg) followed by roots of *Angelica glauca* Edgew. (₹ 1800/kg), roots of *Picrorhiza kurrooa* Royle ex Benth. (₹ 1200-1400/Kg), seeds of *Carum carvi* L. (₹ 1000-1200), bark of *Betula utilis* D. Don (₹ 1000-1200/Kg), whole plant of *Allium stracheyi Baker* (₹600-800/Kg), roots of *Arnebia benthamii* (Wall. ex G.Don) (₹400-600/Kg), leaves of *Rosemarinus officinalis* Spenn. (₹ 400/Kg), stem of *Zanthoxylem armatum* Roxb. (₹ 300-400/ kg), leaves of *Cymbopogan flexuosus* (L.) Spreng. (₹ 350/ kg), leaves of *Origanum vulgare* L. (₹ 200-300/kg), leaves of *Paeonia emodi* Wall.ex (₹ 120-150/Kg), roots of *Saussurea costos* (Falc.) Lipsch. (₹ 125/kg). (Table 2). A total of 5 MAPs product were documented in the study area. The oil of *Rosa damascena*Mill. had maximum price that is ₹ 7000-8000/L which has higher demand in perfumery and soap industries and the minimum price was observed in Rose water (Gulabjal) that is ₹ 210/L.

There are reports which claim that the medicinal plant marketing is not properly organized. This discourages farmers to take up medicinal plants farming at a large scale. In the hills of Uttarakhand, the small landholding of farmers is not consolidated. If marketing of medicinal plants is organized properly its farming may be useful in terms of financial and

Table 2: Retail prices of MAP and their Products

Sl. No.	Species	Trade name	Parts/ product used	Price kg^{-1} (Rs)
1.	*Allium stracheyi* Baker	Faran	Leaf	600-800
2.	*Angelica glauca* Edgew.	Choru	Root	1800
3	*Arnebia benthamii* (Wall. ex G.Don)	Balchhadi	Root	400-600
4.	*Betula utilis* D.Don	Bhojpatra	Bark	1000-1200
5.	*Carum carvi* L.	Kala Jeera	Seeds	1000-1200
6.	*Cymbopogan flexuoux* (L)	Lemon grass	Leaf	350
7.	*Origanum vulgarize* L	Ban Tulsi	Leaf	200-300
8.	*Paeonia emodi* Wall. ex	Chandra	Leaf	120-150
9.	*Picrorhiza kurrooa* Royle ex benth	Kutki	Root	1200-1400
10.	*Potentilla fulgens* Wall ex. HK	Bajardanti	Root	2000
11.	*Rosemarinus officinalis* Spenn.	Rosemary	Leaf	400
12.	*Saussurea costus* (Falc) Lipsch	Kuth	Root	125
13.	*Zanthoxylem armatum* Roxb	Timru	Stem	300

economic gains. Wild collection also plays an important role in the trade of medicinal plants not only in India but other countries of the world. Generally, the marginal farmers and daily wage labors collect medicinal plants which they sell to the local middlemen and sometime to any prospective buyer. The cost of medicinal plants sold in the urban market is higher than the prices paid at the village level collection centre (Kala, 2015).

4. Conclusion

Joshimath block of district Chamoli is the repository of medicinal and aromatic plant resources. A number of plant species are used in home-based remedies to treat various ailments and support livelihood of the resident communities. Traditional knowledge of healthcare is unique in the area and the inhabitants still relies on traditional preparation as primary healthcare option due to limited healthcare facilities. Some of the plants are already under threat because of over exploitation. The majority of the population seems to be unaware of the threat to the medicinal plants growing in the wild. There is a need to provide knowledge to the villagers in order to increase production of medicinal plants which will also help in improving the economic condition of the inhabitants.

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