



Medicinal Plants used to treat Diabetes by Tribal Communities in Jaunsar Bawer Region in Dehradun District of Uttarakhand, India

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Abstract- Uttarakhand is a part of north western Himalaya, and still maintains a dense vegetation cover. Garhwal Himalaya has diverse form of medicinal plants which is of high medicinal values. The local people mainly depend on medicinal plants for their healthcare. They treat themselves with traditional medicinal system. Actually traditional medicine is the sum of the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different culture. Present investigation was carried out in Tiuni and Chakrata block of Dehradun district to study local plants used as medicine to treat diabetes. Near about 12 important medicinal plant species belonging to 11 families have been observed. These plants are used as medicine by local inhabitants for the treatment of diabetes. The plant based traditional medicine system continues to play a significant role in healthcare, with about 80% of inhabitants relying mainly of traditional medicines for their primary healthcare. So, there is a need to create awareness among local people for their conservation and utilization.

Keywords- Medicinal plants, North western Himalaya, Healthcare, Traditional Knowledge, Conservation

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I. INTRODUCTION

Uttarakhand has been the reservoir of enormous natural resources of medicinal wealth, one of the richest floristic zone and provides more than 300 species of medicinal plants in all over country (Gaur 1999). Himalayan flora has been used for various purposes from prehistoric time. The old Indian literature such as Rig-Veda, Atharveda, Charak Sanhita included various uses of plants of Himalayan region (Sharma *et. al.*, 2011). Plant parts are directly used as medicine by majority of community people in all over the world and have no side effect like allopathic medicine (Gangwar *et. al.*, 2010). In the hilly area of Uttarakhand the medicinal plants are used by all section of the community, whether directly as folk remedies or the medicaments of the different indigenous system as well as in modern medicine (Alok, 1991). In the development of human culture, medicinal plants played a key role throughout the world (Yudharaj *et. al.*, 2016). About 12.5% of the 422000 plant species reported worldwide having diverse medicinal properties (Schippmann *et. al.*, 2002; Baul and Mohiuddin, 2011). Among these species trees play a vital role in the formulation of herbal drugs. But now overexploitation is a major threat to tree species. The plant based traditional medicine system continues to play significant role in the life of people belonging to remote areas. The main aim of the present investigation is to obtain information about the local plants used as medicine to treat diabetes in Jaunsar -Bawar region of Uttarakhand.

Diabetes is a chronic diseases that accure either when the pancreas does not produce enough insuline or when the body can not effectively used the insulin. Diabetic patients are increasing with a rapid rate in the last few year. In 2019 diabetes was the direct case of 1.5 million death and 48% of all death due to diabetes occured before the age of 70 years. Diabities are two types, Type 1 and Type 2. In diabetes type 1, the pancreas does not make insulin, because the body's immune system attacks the islet cells in the pancreas that make insulin. In diabetes type 2, the pancreas makes less insulin than used to and patient's body becomes resistant to insulin. People with either type of diabetes are at risk for heart problems if the condition is not well managed, as well as for other complications, including eye disease and blood vessel damage. People of remote areas of Jaunsar Bawar use their traditional knowledge to cure many diseases. The present paper highlighted the plants used as medicine to treat diabetes by local people.

II. Review of literature

Medicinal plant also called medicinal herbs have been discovered and used in traditional medicine practices since prehistoric time. The earliest historical record of herbs are found from the Sumerian civilization where hundred of medicinal plants including clay tablets were recorded. Indian herbs are recorded all over the world for their medicinal properties. Kajilal (1911) described the tropical, sub-tropical and temperate plants both native and naturalized of Chakrata area in Dehradun and Saharanpur forest division, Uttar Pradesh. Singh and Pundir (2004) describe wild medicinal plants of Jaunsar-Bawar area. Singh *et al.* (2011) also describe some medico-magico religious plants of Jaunsar Bawar area.

The article PMCID 30968350 published online on 2019 April 9 by authors Ankit Kumar, Sonali Aswal, Ashutosh Chauhan, Ruchi Badoni Semwal, Deepak Kumar Semwal reflects survey based work mentioning total of 54 plants belonging to 47 genera and 30 families used as the traditional medicine for the management of diabetes in Chakrata regions. The literature revealed that most of the plants are used in the preparation of various antidiabetic formulations such as Chandra Prabha vati and Nisamalaki Kashayan, these formulations along with various drugs are frequently prescribed by the Ayurvedic practitioners in India.

Plan of Work

1. Survey in Jaunsar-Bawar region (Tiuni and Chakrata) to know about the status of diabetes among local people.
2. Enumeration of local medicinal plants used in diabetes by the people of Jaunsar-Bawar region (Tiuni and Chakrata).

Study site- Chakrata

It is a small town lies between the Tons and Yamuna rivers. It is situated in Dehradun district at an elevation of 2118m above sea level and 98 km from state capital Dehradun. Chakrata Latitude is 30° 42' 13.28'' N and Longitude is 77° 51' 49.90'' E. It is a cantonment area. Chakrata has a pleasant climate with maximum temperature rise about 20°-30° and minimum temperature falls to about -1°-2°. In January experience a temperature drop of -7°.

Tiuni- Tiuni is a Tahsil or administrative division in the Dehradun. It is located in the northern part of the district and shares its border with the Tahsil Chakrata to the south, district Uttarkashi to the north and Shimla district of Himachal Pradesh to the west. The Tahsil headquarters is located in the town of Tiuni, which is also the largest town in the Tahsil. The town is also the largest one in the tribal belt of Jaunsar Bawar. Tiuni lies on the geographical coordinates of 30° 57' 0" N and 77° 51' 0" E. It is located at an elevation of 1023m above sea level and 170 km from Dehradun. Both the study sites are different from each other. Chakrata is surrounded by beautiful hills and forest, which make it an ideal destination for nature lovers. Tiuni is also blessed with nature and town is surrounded by mixed forest of Pine, Oak and Deodar trees.



Map of Jaunsar Bawar

III. MATERIALS AND METHODS

The survey was conducted during 2023 in the study areas of Jaunsar- Bawar. The data of study areas and other relevant informations were collected from the local tribal community, elder person, vaidyas and some employees of state forest department through interview, by questionnaires included there personal information, plant's local name, plant growth, plant season, plant part used in traditional therapies. Statistical analysis of the collected data will be done using various computer software. Methodology is based on analysis of relevant data and comparison with existing literary sources and data bases.

IV. Results and Discussion

During this survey (Chakrata and Tiuni) it has been noted that 12 plants are collected having ethnomedical uses against diabetes. The enumerated plants were *Barberis aristata*, *Swertia chirata*, *Picrorhiza kurroa*, *Stevia rebaudiana*, *Gymnema sylvestre*, *Centratherum anthelminticum*, *Phyllanthus emblica*, *Azadirachta indica*, *Syzygium cumini*, *Murrayakoenigii*, *Catharanthus roseus*, *Nyctanthes arbortristis*. Some medicinal plant Thatkinggoda, Kalgiri, Chirayata, Karnoi etc are commonly found in road side area from Sahiya, koruwa, tiuni and chakrata. Jamun, Amla, Kadi pttā, Parizat etc are found in forest area. The details of the above plants are given in Table 1 and Table 2 the result showed that most of the plants/ parts are used in the form of decoction to treat diabetes

Table-1: Medicinal plant species used by local people to treat Diabities in study areas.

Botanical name	Vernacular name	Family	H/S	Part use in diabities
<i>Barberis aristata</i>	Chatroi	Berberidaceae	Herb	Root
<i>Swertia chirata</i>	Chirayita	Gentianaceae	Herb	Whole part
<i>Picrorhiza kurroa</i>	Kutki	Plantaginaceae	Shrub	Root
<i>Stevia rebaudiana</i>	Meethi tulsi	Asteraceae	Herb	Leaves

<i>Gymnema sylvestre</i>	Gudmar	Asclepiadaceae	Herbs	Leaves
<i>Centratherum anthelminticum</i>	Kalijiri	Asteraceae	Herbs	Seeds

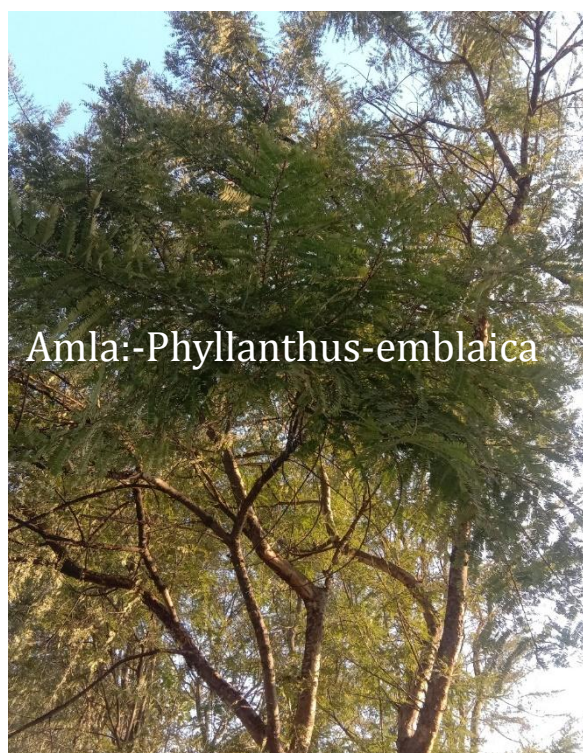
Table 2: Common plants used in diabetes by local communities of study areas

Botanical name	Vernacular name	Family	H/S	Part use in diabetes
<i>Phyllanthus emblica</i>	Amla	Phyllanthaceae	Tree	Fruit and seed
<i>Azadirachta indica</i>	Neem	Meliaceae	Tree	Leaves
<i>Syzygium cumini</i>	Jamun	Myrtaceae	Tree	Fruit and seed
<i>Murraya koenigii</i>	Kadi patta	Rutaceae	Shrub	Leaves
<i>Catharanthus roseus</i>	Sadabahar	Apocynaceae	Herbs	Leaves
<i>Nyctanthes arbortristis</i>	Harsingar	oleaceae	Shrub	Leaves and flower

The knowledge of utilization of medicinal plants is very high among Jaunsar- Bawar people. The basic ingredients in the traditional medicine are the medicinal plants, which are depleting at a faster rate due to the increase in consumption and indiscriminate drawl of resources from the wild (Kumari *et. al.*, 2012). Continuous erosion in the traditional knowledge of many valuable plants for medicine in the past and the renewal interest currently, the need existed to review the valuable knowledge with the expectation of developing the medicinal plants sector (Kala *et. al.*, 2004). Medicinal plants with the most stem and leaves were recorded in present investigation. The herbal drug determines the parts of a plant (leaves, flowers, seeds, roots, barks, stems etc) used for preparing medicines (Anonymous 2003). There is a need to protect medicinal plants in the hilly areas of Jaunsar- Bawar region of Uttarakhand. In addition to the requirement for conservation of medicinal plants, it has also become essential to protect and patent the traditional knowledge (Raghupathy 2001).

V. Conclusion

Jaunsar- Bawar area of Uttarakhand has diverse form of medicinal plants, which is of high medicinal values. Many botanists from our country and entire the world have done their research work on these medicinal plants and research work is going on at present. However, looking at the current status of the medicinal plants in Jaunsar- Bawar region, it seems that there is a strong need for their protection and management. Even most of the local people here are not aware of their conservation and utilization. In such a situation, there is a need to create awareness and to set up medicinal plant centers in these areas. So that the economy of the people here can be strengthened and medicinal plants can be supplied all over the country.





Photographs of some medicinal plants



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