Journal of
Complementary Medicine & Alternative Healthcare

Juniper Publishers
key to the Researchers

Research Article
Volume 1 Issue 1 - December 2016

J Complement Med Alt Healthcare

Zanthoxylum Acanthopodium DC. (Rutaceae) - A Favourable Ethnomedicinal Fruit for The Local Inhabitants of Darjeeling Himalaya of West Bengal, India

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Submission: November 18, 2016; **Published:** December 01, 2016

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Abstract

Present paper deals with the ethnomedicinal fruit *Zanthoxylum acanthopodium DC.* Rutaceae, used by the local inhabitants of Darjeeling Himalaya of West Bengal, India. Local inhabitants of the regions are Lepcha, Sherpa, Bhutia, Tamang, Limbu or Subba, Bhujel or Khawas, Sunuwar or Mukhia, Rai, Thapa or Manger, Chettri, Bahun or Sharma, Newar or Pradhan, Kami, Damai, Sherki etc. *Zanthoxylum acanthopodium DC.* is sparsely found in the sloppy, barren and forest lands within an altitudinal range 1200-2800 m. Plant pricky woody shrub, flowering in the month of April and persist till May and fruit in June to October. It was observed that mature fruits are edible in the form of pickle and used in case of gastritis. Some fruits available in the market and people with taste of it buy this fruit at any cost annually. They keep it in the form of pickle to eat later.

Introduction: Darjeeling is the Northernmost hilly district of West Bengal which lies between 27º31'05" and 26º27'10" North latitude and between 88º53'00" and 87º59'30" East longitude. There are four Sub-Divisions viz., Darjeeling, Kalimpong and Kurseong which are hills and Siliguri falls under plain. The aim of the present investigation is to find the ethnomedicinally important fruit *Zanthoxylum acanthopodium DC.* used by the local inhabitants and to record the flowering time, common name, local distribution, general distribution, means of propagation, soil type, plant parts used, ethnomedicinal uses throughout the region.

Methodology: The ethnomedicinal informations are collected from senior resourceful citizens, school teachers, herbal practioners, spiritual healers like Jhankri, Dowa, Mangpa, Dhami, Bijuwa, Bungthing, Mata, Vendors, Bhagawati, Phedangma, Bonbo, Puimbo, Ghyapring, Dolma, Lama and Priests of all ethnic groups of Darjeeling Himalaya.

Results: Wild edible fruits are the important source of dietary supplement for local inhabitants. Mature fruits of *Zanthoxylum acanthopodium DC.* cannot be eaten more than one or two number of fruits at a time by a person. It has typical fragrance which comes after crushing fruits which is liked by the locals. Local inhabitants of the regions are very much familiar with this fruits and frequently used in case of gastritis and in the form of pickle both raw and preserved.

Conclusion: The fruits are preserved in the form of pickle to eat during off season. A single fruit is fatal for pig (a personal communication).

Keywords: *Zanthoxylum Acanthopodium DC*; Ethnomedicinal fruit; Darjeeling; Himalaya; India

Introduction

Darjeeling is the Northernmost hilly district of West Bengal which is a part of the Eastern Himalaya and it lies between 27º31'05" and 26º27'10" North latitude and between 88º53'00" and 87º59'30" East longitude. The total area of the district is 3254.7 sq. km. There are four Sub-Divisions viz., Darjeeling, Kalimpong and Kurseong which are hills and Siliguri falls under plain (Figure 1). The altitude of the district varies from ± 130 m at Siliguri to as high as 3660 m at Sandakphu. During field studies in the regions revealed a huge wealth of traditional

knowledge on ethnomedicinal plants and their uses amongst the people. Extensive field survey was conducted to the study areas and collected authentic and valuable information. The specimens were collected without uprooting and disturbing in the nature and properly worked out both in the field and the laboratory and pressed in blotting paper. Finally, the specimens are preserved in Taxonomy and Ethnobiology Research Laboratory of Cluny Women's College, Kalimpong. It is found that mature fruits of *Zanthoxylum acanthopodium DC*. is ethnomedicinally important and largely used in case of gastritis and edible in the form of pickle in their daily food by the local inhabitants of the district. The region harbour large number of plant species with wide range of diversity and distribution. This region was explored by Sir J. D. Hooker 1848-49, and mentioned in his work *Flora of British India* [1]. Cowan & Cowan [2] and Biswas & Chopra [3], have contributed major report in medicinal plants of Darjeeling and Sikkim regions. The medicinal and ethnomedicinal plants of the region and their uses are partially studied by workers like Yonzone et al. [4]; Yonzone, [5]; Rai *et al*. [6], Rai & Bhujel [7], Yonzone & Bhujel [8], Rai *et al*. [9], Yonzone et al. [10-14]. Flora of Bhutan by Grierson & Long [15] and by Noltie [16] also have studied to carry out this work.

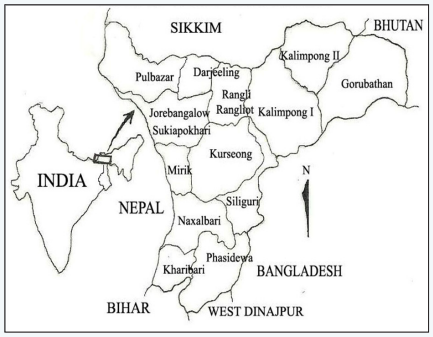

Figure 1: Location of Darjeeling district of West Bengal, India.

Materials and Methods

The ethnomedicinal informations are collected during the year June 2007 to June 2009 and November 2013 to October 2016 through interviews from senior resourceful citizens, school teachers, herbal practioners, spiritual healers like Jhankri, Dowa, Mangpa, Dhami, Bijuwa, Bungthing, Mata, Vendors, Bhagawati, Phedangma, Bonbo, Puimbo, Ghyapring, Dolma, Lama and Priests of all ethnic groups of Darjeeling Himalaya. Group discussion was also arranged with the informants in local language (Nepali vernacular). As per the suggestion of interviewed people and the literatures, all the ethnomedinical plant species were collected during flowering times covering all the seasons of the year without uprooting and disturbing the nature. The collected specimens were worked out in the field and pressed in blotting paper and pressed. Identification and authentification of identified specimens was done in the herbaria at Central National Herbarium, Botanical Survey of India, Sinpur, Howrah and Sikkim circle (Gangtok) and finally from Department of Botany, North Bengal University, Rajarammohunpur, district Darjeeling. Necessary photographs were collected. Herbarium preparation, identification and documentation work was done in the Taxonomy and Ethnobiology Research Laboratory. The aim of the present investigation is to find the ethnomedicinally important fruit *Zanthoxylum acanthopodium DC*. used by the local inhabitants in case of gastritis and edible in the form of fresh and preserved pickle and to record the flowering time, common name, local distribution, general distribution, means of propagation, soil type, plant parts used, ethnomedicinal uses throughout the region.

Botanical Description

Perennial erect shrub with spiny stem (Plate 1: A,B,&C), 250-300 cm tall. Branches brown tomentose. Leaves odd-pinnate, 10-30cm long, ovate, lanceolate to oblong, acute, margin serrate; wings 0.8-1.2cm broad between leaflets (Plate 1: D&E). Flowers in subumbellate panicles. Male flowers; calyx-lobed, petals 4, ovate-elliptic, stamens 4, female. Flowers; calyx and corolla as in male flowers; carpels 4, ovoid, styles cohering. Ovary 2-5, carpellate, Fruit berry, ovoid and glandular (Plate 1: F,G,H&I).

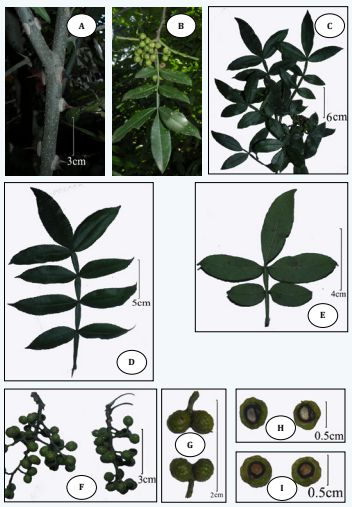

Plate 1: *Zanthoxylum acanthopodium DC*., A. Pricky spines on stem; B. Habit (Fruiting twig); C. Branch with fruits; D. Ventral view of large leaf; E. Dorsal view of small leaf; F. Mature fruits in bunch, G. Enlarge view of fruits; H. L.S. of single fruit and I. T.S. of single fruit.

Flowering:	April - May.
Fruiting:	June - October.
Common name:	Bokay Timbur (Nepali Vernacular).
Present availability within Darjeeling Himalaya:	Sparse in habitat.
Specimen Cited:	India, West Bengal, Darjeeling, Kalimpong Block – I, Gumbahatta.
Local distribution within Darjeeling Himalaya:	Seri khola, Darjeeling,

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Lopchu,

Sukiapokhari, Senchel, Samalbong, Nimbong, Pedong,

Kalimpong, Pokhraybong, Mangmaya.

Altitudinal range:	1600-2800 m.
General Distribution:	Canada and U.P.
Means of Propagation:	Through seeds.
Harvesting time:	June - October.

Soil type: In natural habitat, it is preferably grown in less acidic to moderate acidic soil with pH 3 - 4.5. Sandy loam, clay to red lateritic soil is best for its cultivation.

Plant parts used:

Mature fruits, bark, leaves and roots.

Chemical constituents

The leaves of *Zanthozylum acanthopodium DC*, obtained 58 commpounds, with 75.6% of the oil and important compounds were linalool (14.3%), 9,12-octadecadienol (8.4%), 1.8-cineole (7.7%, 2-undecanone (7.3%), farnesol (3.6%), 9,12,15-octadecatrienol (3.2%), β-caryophyllene (3.0%) and phytol (3.0%) with other seven trace compounds (less than 0.02%) [17].

Ethnomedicinal uses

Local: Mature fruits are eaten in case of gastritis, stomach colic and liver complain, fruits are used as anti typhoid, gastritis, liver disorder and toothache. The bark and seeds are used as a tonic in fever and bowel complaints. It is supposed to possess stomachia and carminative properties. In the ayurvedic medicine, the bark, fruits and seeds are extensively employed as carminative, stomachic and anthelmintic. The fruits are used for gums and dental disorders as dyspepsia and lotion for scabies. Fresh roots are used to cure dental problem. An essential oil derived from the dried fruits is used in the preparation of tooth powders.

Results and Discussion

Wild edible fruits are the important source of dietary supplement for local inhabitants of certain geographical region of the country. The tribal population are eagerly engaged to eat such wild fruits and vegetable items for their survival. Similarly, *Zanthoxylum acanthopodium DC*. is such a fruit which cannot be eaten more than one or two number of fruits at a time by a person. It has typical fragrance which comes after crushing fruits which is liked by the locals. People of the region mainly ethnic groups like Lepcha, Sherpa, Bhutia, Tamang, Limbu or Subba, Rai, Thapa or Manger, Newar or Pradhan, Bhujel or Khawas, Sunuwar or Mukhia, Chettri, Bahun or Sharma, Kami, Damai, Sherki are very much familiar with this fruits and frequently used in case of gastritis and in the form of pickle both raw and preserved. Once fruit is craushed inside mouth using teeth causes breethlessness leading to death of the eater. However, any person suffering by breathlessness after causing *Zanthoxylum acanthopodium DC*. fruits is given a pinch of fine soil, he quickly recovers. In fact eating of soil is the only immediate solution to this problem (mother's instruction to the last author during childwood which they practically experimented among brothers during their childhood taking fruit). Fruits are sold in the markets of Kalimpong (Plate 2: A&B), Darjeeling and Kurseong in the month of June -August.

Plate 2: *Zanthoxylum acanthopodium DC*, A. Mature fruits (within black circle) sold in the Kalimpong main town market by Lepcha merchant; B. Market display mature fruits.

Conclusion

The fruits are preserved in the form of pickle to eat during off season along with chilli as "achar". It looses its breedthlessness property once it is preserved using salt which makes it convinent to use. A single fruit is fatal for pig (a personal communication).

Acknowledgements

All the people who were interviewed during survey period are acknowledged for their help and cooperation with the team.

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