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Taxonomical study and medicinal uses of some oil yielding plant species of sambalpur sadar range of sambalpur south forest division, Odisha

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Abstract

Taxonomical and ethnobotanical study was carried out during 2011- 2016 in Sambalpur Sadar range of Sambalpur South Forest Division, Sambalpur, Odisha. The study was undertaken in the locality due to its diversified topography and tropical moist deciduous forest in some places providing the most congenial condition for the luxuriant growth of plants. During the survey a number of plant species were collected. Among these some oil yielding plants have been reported and discussed with the local inhabitants. The paper reports 10 numbers of oil yielding plants belonging to 8 families. The tribals and other rural people of the locality use the plants for various purposes including medicine. The study was focused on identifying plants, their habit and habitat, flowering and fruiting period and medicinal uses. The data was collected through interview and questionnaires.

Keywords: taxonomy, medicinal use, oil yielding species, sambalpur sadar range

1. Introduction

India has been recognised as one of the countries of the world with mega diversity. It is estimated that 12 countries possess 70% of the total flowering plants of the world^[1]. Western Ghats and Eastern Ghats are two of the 18 hotspots of the world due to their rich phytodiversity and high percentage of endemism^[2]. It is the second largest populated country in the world and a majority of its population directly depend on biological resources for livelihood. India has approximately 17, 527 species of angiosperms^[3].

Odisha is a state in eastern India with diversified and abundant of natural vegetation and wildlife. The forest coverage in Odisha is 58,136.869 sq km. This is about one-third (37.34%) of the total land area of the state.

Taxonomical as well as ethno botanical survey was carried out during 2012 - 2016 in Sambalpur Sadar Range, which is a part of Sambalpur South Forest Division of Sambalpur District in Western Odisha. The survey work was undertaken to study the vegetation, traditional knowledge of medicinal plants and their uses amongst the tribals and local rural inhabitants.

The district is situated between 20° 40' and 22° 11' N latitude and 82° 39' and 85° 15' E longitude at an average altitude of 150.75 metres above mean sea level. The total geographical area of the district is 6,702 sq km and the total forest coverage is 3276 sq km. The district is bound on the east by Deogarh district, on the west by Bargarh and Jharsuguda districts, on the north by Sundargarh and on the south by Subarnapur and Angul districts. The forest type of Sambalpur forest division was mapped and equated within the standard of Champion and Seth's classification scheme^[4]. Based on Champion and Seth's classification of forests Sambalpur forest division falls under two types of forests such as (i) dry mixed deciduous forest and (ii) dry deciduous scrub forest. The mixed deciduous type is mainly consists of "Sal" (*Shorea robusta*) trees, along with some other trees and herbs. The dry deciduous scrub type is generally confined to dried parts.

Sambalpur Sadar Range lies on an undulating plain and is situated at 21° 28' N latitude and 85° 58' E longitude. According to the District Forest Office, Sambalpur the total forest coverage of the present study area is 107.66 sq km. For administrative purpose it is further subdivided into six forest sections such as Jujumura, Bhimkhoj, Basiapada, Jhankarpali, Panchuput and Sambalpur sadar.

The climatic condition of Sambalpur Sadar Range is hot and dry summer, hot and humid monsoon and post monsoon and cold winter season. The temperature rises up to 46°C in May-June. In winter minimum temperature is observed as low as 6°C during last part of December and early January. The average rain fall is about 1500mm.

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The maximum rain fall is found in July and August.

Since time immemorial the plants have been used as medicine by the tribals and other rural people residing in and around the forests.

2. Materials and Methods

The authors have conducted frequent field surveys in different forest localities of Sambalpur Sadar Forest range during September 2012 to March 2016. The survey was conducted with the help of the local people and forest personals so that proper identification of wild species could be done. The method of study was adopted according to the study proposed by earlier workers [5]. Plant specimens collected during the survey were identified with the help of standard flora books [6-9]. Besides, the help of website [10] has also been taken into consideration to record the new names and changes in the botanical names of the plant species.

During the survey work some oil yielding plants were noticed which are mostly used for cooking and medicinal purposes by the tribals and local inhabitants in their day to day life. The traditional healers known as *Kabiraj*, *Vaidya* and the tribal priests such as *Jhankar*, *Dehery* and *Desari* were contacted and discussed separately with them to collect information regarding the ethnomedicinal use of the plants. Information on various aspects of wild species has also been collected through personal interviews with different groups of people. The collected ethnobotanical information has been cross-checked with some available published scientific literatures [11-20].

3. Results

Out of a number wild species collected during the survey 10 species were identified as oil yielding plants belonging to 8 families. The plant species with scientific names are arranged alphabetically followed by family name, brief description of the plant, habit, habitat, flowering and fruiting time, local name, locality and voucher number, medicinal uses, parts used, dosage and mode of application. The identified and verified voucher specimens have been preserved in the herbarium of Botany Department of Fashimal Anchalik College, Fashimal, Sambalpur.

Oil yielding species of Sambalpur Sadar Range

Arachis hypogea L. (*Leguminosae*)

Annual, erect to sub-erect herb. Leaflets stipulate, opposite, obovate, entire, obtuse to mucronate, base cuneate, obtuse to round. Flowers yellow. Pods oblong, 1-3 seeded. Seeds ovoid or oblong.

Habit: Herb

Habitat: Subterrestrial cultivated

Flowering and fruiting: August-October.

Local name: Mugphali

Locality & voucher number: Sahaspur-72

Uses: Oil produced from the seeds is used for cooking purpose as well as medicine. The seed paste (5gm) along with *Piper nigrum* fruit powder and honey is taken thrice daily to cure stomach-ache.

Azadirachta indica Juss. (*Meliaceae*)

A large tree. Leaves imparipinnate; leaflets ovate-lanceolate, serrate. Flowers white, in axillary racemose panicles. Drupes ovoid-oblong, 1-seeded.

Habit: Tree

Habitat: Terrestrial

Flowering and fruiting: January-May.

Local name: Leem

Locality & voucher number: Amkuni-41

Uses: Oil produced from the seeds is an affective medicine against skin diseases. Seed oil and *Shorea robusta* gum are mixed together and applied on burnt wound. A piece of bark is crushed and soaked overnight in a glass of water and filtered in the morning. The filtrate is taken once daily in empty stomach for 5 days to cure stomach disorder.

Corymbia citriodora (Hook.) K.D. Hill & L. A. S. Johnson (*Myrtaceae*)

A tall tree up to 50 m tall, bark smooth throughout. Juvenile leaves opposite; adult leaves usually alternate, ovate to lanceolate, coriaceous, lemon scented when crushed. Flowers white usually in 3-5 flowered umbels, sometimes solitary or in 2-3 flowered fascicle. Fruit a capsule, barrel-shaped, valves-3, enclosed. Seeds many, ovoid or cuboid, reddish black and glossy.

Habit: Tree

Habitat: Terrestrial

Flowering and fruiting: October-December

Local name: *Ucalypatas*

Locality & voucher number: Arda-24

Uses: Essential oil from the leaves is of commercial value and it is a powerful antiseptic and used against skin diseases. Leaves (10-15 numbers) are crushed and boiled in water. The person suffering from itching problem is advised to take bath in the decoction along with neem oil to cure itching.

Glycine max (L.) Merr. (*Leguminosae*)

A sub-erect annual herb, 30- 70 cm. Leaves 3-foliolate; petiole long, stipulate; leaflets ovate or oblong-lanceolate, acute, hairy on both sides. Flowers purplish or pale blue in very short racemes. Pods oblong, 2.5- 3.9 cm long, 2-4 seeded. Seed ellipsoid.

Habit: Herb

Habitat: Subterrestrial cultivated

Flowering and fruiting: April-May and October-December

Local name: Soya bean

Locality & voucher number: Hatibari-91

Uses: Seeds yield oil is used for cooking purpose. Seeds decoction along with *Piper longum* and honey is taken twice daily to cure cold and fever. Root paste along with coconut oil is applied overhead to cure headache.

Madhuca longifolia (Koen. ex L.) Mac Bride (*Sapotaceae*)

A large deciduous tree. Leaves, alternate, simples, broadly elliptic, clustered at the end of the branches, Flowers in axillary panicles in dense clusters, pale yellow. Fruits berries, ovoid, yellow when ripe; seeds stony.

Habit: Tree

Habitat: Terrestrial

Flowering and fruiting: April-May and October-November

Local name: Mahul

Locality & voucher number: Jamloi-85

Uses: Flowers and fruits are edible. Seed oil is used for cooking purpose and lighting the lamp. Country liquor is produced from the flowers. Burning oil cake is put in water and the fume so emanated is exposed to affected part of the face to cure herpes.

Magnolia champaca (L.) Baill. ex Pierre (*Magnoliaceae*)

Evergreen tree up to 35-40 m high; bark pale-grey, smooth. Leaves ovate, ovate-lanceolate, glabrous above, pubescent beneath with strong nerves. Flowers cream to yellow or

yellow-orange, fragrant. Fruit is a follicle, warty. Seeds 1, scarlet.

Habit: Tree

Habitat: Terrestrial

Flowering and fruiting: March-April and July-August

Local name: Champa

Locality & voucher number: Kendumunda-104

Uses: The flowers of the plant have high aromatic odour which are used to manufacture costly perfume. Flowers (10gm) is boiled in water (250 ml). The decoction (5-10 ml) along with honey is taken 2 times daily to cure fever.

Pongamia pinnata (L.) Pierre (*Leguminosae*)

A medium-sized tree. Leaves imparipinnate; leaflets ovate to obovate, entire, acuminate. Flowers light pink, in axillary racemes. Pods obliquely oblong, 1-seeded.

Habit: Tree

Habitat: Terrestrial

Flowering and fruiting: March –November.

Local name: Karanj

Locality & voucher number: Lipinda-66

Uses: Oil from the seeds is valued for medicinal purpose. Seed oil with a little camphor is applied on the affected part to cure pimples, scabies and eczema. Flowers (120gm) is boiled in 500 ml of water and decoction (40-60ml) is taken once daily in empty stomach to cure diabetes.

Schleichera oleosa (Lour.) Oken (*Sapindaceae*)

A larger tree, Leaves, paripinnately, 18-40 cm long; leaflets 2-4 pairs, subopposite, elliptic or oblong, entire, acute or acuminate, glabrous. Flowers small, yellowish, in racemes, axillary or below the leaves. Fruit a drupe, ovoid, pointed. Seed compressed brown.

Habit: Tree

Habitat: Terrestrial

Flowering in January- March and fruiting in May-August.

Local name: Kusum

Locality & voucher number: Kusamura-43

Uses: Seed oil is used for cooking and medicinal purposes. Seed oil with camphor is applied on the affected part to cure eczema. Bark paste (5 g) along with *Piper nigrum* fruit (5-7 numbers) powder is taken twice daily for 5-7days to cure dysentery.

Shorea robusta Gaertn. f. (*Dipterocarpaceae*)

A large, deciduous tree. Leaves simple, alternate, ovate-oblong, entire, acute. Flowers in terminal and axillary panicles. Fruit capsules, ovoid, winged with persistent sepals.

Habit: Tree

Habitat: Terrestrial

Flowering and fruiting: March-May.

Local name: Rengal

Locality & voucher number: Dangapal-63

Uses: Oil produced from seeds is used for cooking purposes. Latex (20g) and camphor (10g) are mixed together and crushed in *Sesamum indicum*. The paste is applied to cure kibe.

Strychnos nux-vomica L. (Strychnine)

A large tree, up to 20 m high; bark grey, smooth. Leaves simple, opposite, exstipulate; broadly elliptic or elliptic-ovate, base acute, apex acute or obtuse, margin entire, glabrous, shining. Flowers greenish-white, in short peduncled cymes at the end of short branchlets; bracteates; bracteolate. Fruit a berry, globose, orange or yellowish-red, glabrous. Seeds 3 or

4, orbicular, flat, coin like shiny, greenish-white.

Habit: Tree

Habitat: Terrestrial

Flowering and fruiting: March- April and December- January.

Local name: Kuchla

Locality & voucher number: Chhamunda-103

Uses: Seed oil of the plant and mustard seed oil are boiled together and after cooling, the oil is applied externally on the affected part to cure joint pain. Seed powder (3g) along with *Zingiber officinale* rhizome extract (one teaspoon) and honey is taken twice daily for at least for 7 days to get relief from ring worm.

4. Discussion

A large number of angiosperms are recognised as economically important plants. The present study was emphasized on taxonomy and medicinal utility of some oil yielding plants of Sambalpur Sadar range in Sambalpur Forest Division. Due to lack of knowledge about the vegetation of the locality the plants are destroyed indiscriminately. Oil is an essential commodity in day to day life of human race. It has been observed that people of the locality mostly extract oil from *Arachis hypogea*, *Azadirachta indica*, *Glycine max*, *Madhuca longifolia*, *Pongamia pinnata* and *Shorea robusta* and use it variously in their day to day life.

The study reveals that there are 8 trees and 2 herbs among the identified species as oil yielding plants during the survey. Again it has been recorded that out of 10 species, 7 plants are used both as edible and medicinal purpose and only 3 species are used as medicine. There are 17 prescriptions reported from 10 species used to cure diseases and ailments like stomach ache, wound, stomach disorder, fever, headache, herpes, itch, pimples, eczema, scabies, diabetes dysentery, kibe, joint pain, and ringworm. Out of the reported species, oil is produced from the seeds of 7 plants and in case of *Corymbia citriodora* and *Magnolia champaca* oil is produced from the leaves and flowers respectively.

5. Conclusion

Present day situation reveals that trees are being cut in huge number by the human race to fulfil their day to day requirements. People depend on forests mostly for food, shelter, agriculture and medicines. Hence it is time to take appropriate measures to create awareness among people to save the forests and forest products. During the study it has also been observed that due to huge collection of leaves, seeds and fruits, the process of propagation and regeneration of the plants is badly affected, which possibly decreases the population of species rapidly day by day. Hence the villagers and the people residing close to forest should be motivated for plantation, protection, and conservation of plant species. Besides, awareness among the young mass should be encourage to take care of their forefather's heritage of traditional knowledge, so that the medicinal plants could be used by them in their day to day life and also save for future generation.

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