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IJBT Special Issue Vol. No. 2: 15-19.
ISSN: 0976 - 4313

Informative Article

Sonari (Cassia fistula L.): A medicinal and ethno-cultural plant at Niyamgiri Hills ranges among a primitive tribe (Dongaria Kandha) of Odisha, India

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Received: 28.10.2011; Revision: 5.11.2011; Accepted: 07.12.2011; Published: 15.12.2011

Abstract
Sonari *(Cassia fistula* L.), a common tree species of Niyamgiri Hill ranges of Odisha, belongs to the family Caselpinaceae, the plant parts of which are used as traditional medicine to cure different diseases by a primitive tribe Dongaria Kandha also called "Jivant Bhuta" (Live Ghost) living in this locality. The traditional indigenous knowledge of the primitive tribes and the ethnocultural practices of the locality in gradually loosing its importance due to lack of proper documentation. Keeping this in view an attempt has been made in the present study to gather data from literature and from field survey to establish the pharmacological and ethnomedicinal importance of this plant for creating a special awareness to conserve the ethic knowledge and the plant as well.

Keywords: *Cassia fistula*, Dongaria Kandha, Ethnobotany, Ethno-cultural uses, Niyamgiri Hills

Introduction

World health Organization reported that the traditional medical practitioners treat about 85 % of patients in India (WHO survey,1993), which shows the significant valuable relation between local tribal people with medicinal plants.Odisha claims a prominent position among the states and Union Territories of India for having the largest varieties of tribes that is 62 in number including 13 vulnerable tribal groups as well as the third highest tribal populations numbering over 8 millions, about 9.7 % of the country's total population and constituting 22.13 % of the state's total population as per 2001 census. It means among every five persons one belongs to a scheduled tribe community in the state (Ota and Mohanty, 2008). Every tribal group represents unique indigenous ethnobotanical systems that include the mode of taking or applying externally or internally plant parts as a cure and specific plants for specific uses. *Cassia fistula* L. (Sonari) a common plant in Niyamgiri hills regions and utilized in various aspect in medicinal as well as ornamental. It is also used to make different types of utilizing thing among Dongaria Kandha. It is a tree belongs to family Casealpinaceae with very handsome in flower, with large, closely veined ovate, ovate-lanceolate or ovate-oblong acuminate or acute leaflets. Light bright yellow flowers with long pendulous racemes, succeeded by long cylindrical drooping pods. The wood is hard, strong and heavy and much in demand for carts and agricultural implements. The flowers are eaten (Haines, 1922). It gives medicine in the form of bark, leaves, roots, seeds and fruits as well as timber for domestic uses. Without proper documentation of such traditional values, the cultural and traditional heritage of Odisha is loosing its importance and indigenous knowledge is being lost and tribal communities are forced to change their livelihood which leads to ethoncultural degradation. Therefore an attempt has been made to explore the traditional healthcare system and domestic uses of *Cassia fistula* L of the Dongaria Kandha of Niyamgiri Hills, Odisha. They are one of the primitive tribes of the state and enjoy a critical and symbiotic relation with the Niyamgiri forests. The Dongaria Kandha inhabits the lofty Niyamgiri Hill ranges spread across

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International Journal of Biological Technology

www.gbtrp.com
IJBT Special Issue Vol. No. 2: 15-19.
ISSN: 0976 - 4313

Bissamcuttack, Kalyansinghpur and Muniguda blocks in Rayagada district. In this paper authors presented the importance of *Cassia fistula* L. among this community to conserve the ethic knowledge and explore their survieness.

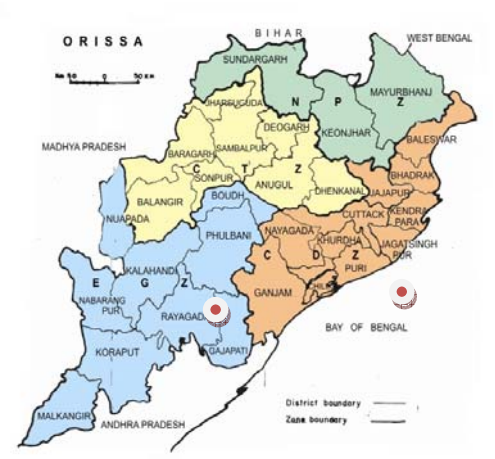

Fig.1: Geographical location of Niyamgiri hills, Odisha, India.

Methodology

As a part of Eastern Ghats of India, the Niyamgiri Hills ranges, situated on the borders of Rayagada and Gunupur subdivision of southwest part of Odisha, rise steeply from 1.000 feet having number of peaks, of which the highest is 4,970 feet above the sea level. Niyamgiri, about 250 sq. Km. in area lying between 19° 26' to 19° 43' N latitude, and 83° 18' to 83° 28' E longitude(Patnaik and Daspatnaik, 1982). Topographically, 75 % of the Niyamgiri hills landmass is covered with dense forests with evergreen and semi- evergreen in nature where the average forest density of Niyamgiri is around 0.6, which are 1300 to 1400 trees per acre. Eight distinct types of vegetation are seen in Niyamgiri, depending on the local microclimate, plant density, species association and effect of biotic and edaphic factors, among which deciduous forests predominate. *Terminalia tomentosa*, *Shorea robusta* and *Cassia fistula* are the most dominant species. Culturally and ecologically the Niyamgiri Hills are extremely rich and significant. Most important aspect of Niyamgiri Hills is that rich in Mountain Rivers which give the location are unique Phytogeographical zone. Therefore it was declared as Nature Conservation or Game Sanctuary. It has been proposed as a Wild Life Sanctuary in the working plan of district Kalahandi forest division. The state Wildlife Organization has a proposal to declare this area as South Odisha Elephant Reserve as mentioned in the vide memo no. 4643/ 3 WL (Cions) 34 / 04 dated 20.08.2004 (Dash *et al*., 2009, Vasundhara report) An ethnobotanical and ethno-cultural survey at Niyamgiri of District Rayagada was carried out from 26-03-2010 to 31-03-2010 .The information on *Cassia fistula* L. was collected based on interactions with Dongaria community. The medicinal property of plant was confirmed by at list 4 informants by cross checking and group discussions with these community. The plant species was identified by Dr. R.C.Misra, Plant Taxonomist, National Bureau of Plant Genetic Resource, Base Centre, Cuttack.

Table -1: Ethno-sociocultural uses of *Cassia fistula* L. among Dongaria Kndha

Parts used	*Village/ Division*	*Uses*
Fruits	Sokta Nala	Used to prepare brown traditional dye for colouring purposes during traditional puja (Worship).
Wood	Near Muniguda	Wood is used for much domestic purpose and due to hardness used to making agricultural tools.
Stem bark and Seeds	Bissamcuttack	Stem bark or seeds with black pepper is used to treat menstrual problems.
Flowers	Chaticona	Used in worship and also used as domestic Bukeh. Flowers are eaten as vegetables.
Leaves	Katiamba	Leaf juice is applied on itching portion of body and different types of skin infections.
Bark	Golgola	Bark paste applied on swollen part due to injury of Livestock
Stem bark	Dengamati	The fresh stem bark paste applied on scorpion bite to reduce pain and give coldness.

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IJBT Special Issue Vol. No. 2: 15-19.
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Table -2: Ethnobotanical survey of parts of *Cassia fistula* L

Plant parts	Uses	Sources
Stem bark	Anticancer.	Singh, 2009.
Fruit pulp	Purgative	Dwivedi, 2009.
Seed	Used among children to cure cough	Jadhav, 2009.
Fruits	Extract of fruits is given by the tribal to their cattle in indigestion	Jadhav, 2009.
Roots	Useful in skin disease	Kumar and Chitra, 2009.
Bark	Useful in leprosy	Kumar and Chitra, 2009
Flowers	Useful in dry cough	Singh, 2009.
Fruits	Useful in ringworm	Singh, 2009.
Fruit pulp	Pulp is used as laxative	Dwivedi, 2009.
Ripe fruit	Ripe fruit along with honey given twice a day for a week to cure whooping cough	Maliya, 2009.
Fruits	Used as purgative	Maliya, 2009.
Fruit soup	Used in liver disorder	Maliya, 2009.
Seeds	Used in treatment of jaundice	Maliya, 2009.
Fruit pulp	Fruit pulp is given in fever	Srivastava, 2009.
Stem bark	Used in food poisoning	Upadhya et al., 2009.
Bark	Bark decoction is used for bath in leprosy	Silja et al., 2008.
Bark	Bark paste used in eczema	Chendurpandy, 2010.
Leaf	Fresh leaf juice is used as laxative	Sivaperumal, 2010.
Fruit	Dried fruits used as laxative	Bapuji and Ratnam, 2009.
Flowers	Flower extract is administered daily once for a fortnight during rheumatic pain.	Reddy et al., 2010.

Table -3: Survey of the Active compounds from different parts of *Cassia fistula* L.

Active compounds	Plant parts	Sources
Caprylic and Myristic acids	Seed	Sayeed et al., 1996.
Lupeol	Stem bark	Sen and Shukia, 1968.
Galactomannan	Seed	Lal and Gupta, 1976.
Rhein	Pulp	Modi et al., 1952.
Oxanthraquinone	Bark	Rani and Kalidhar, 1998.
Leucopelargonidin	Flower	Kumar et al., 1996.
Rhamnetin-3-O- gentiobioside	Root	Vaishnav and Gupta, 1996.

Table- 4. Ethno-pharmacological survey of *Cassia fistula.* L.

Activity	Parts
Antiviral activity	Stem bark (Maliya,2009)
Bacterial infections	Leaf and Root (Awal *et al*., 2010)
Wound healing activity	Leaf extract (Bhakat *et al*.,1998)
Antifertility activity	Root extract(Yadav and Jain, 1999)
Antidiabetic activity	Methanolic extract of Leaves (Silwat *et al*.,2008)
Anthelmintic activity	Methanolic extract of fruit pulp and seeds (Irshad et al.,2010)
Antifungal activity	Leaf extract against *Candida albicans (*Singh and Karnwal, 2006)
Antifungal activity	Bark extract against *Candida albicans* (Priya *et al*., 2010)
Antifungal activity	Bark extract against *Trychophyton mentagrophytes (*Duraipandiyan and Ignacimuthu , 2010)
Antifungal activity	Leaves against *Aspergillus niger* and *Candida tropicalis (*Panda *et al*.,2010)

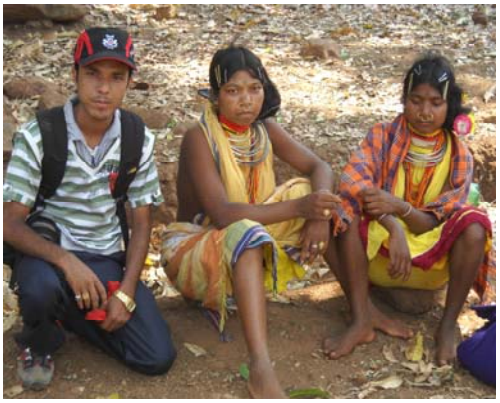
Results and Discussion

The traditional knowledge of Dongaria Kandha of Niyamgiri has high ethnobotanical and ethno-cultural importance. They utilize Sonari (*Cassia fistula* L.) in various purposes. The findings of the field survey (Table - 1) emphasized ethno-cultural values of *Cassia fistula* L. among Dongaria Kandha such as flowers were used for worship, wood used in making agricultural tools and domestic utensils as well as the other domestic purposes. The literature survey (Table-2) showed its

etnomedicinal properties such as fruit pulp used among children to cure cough (Jadhav,2009), bark useful in leprosy(Kumar and Chitra ,2009), fruit soup is used in liver disorder (Maliya, 2009), seeds are used to treat jaundice (Maliya ,2009) flowers are used in rheumatic pain(Reddy,2010). Table-4 showed its anti-microbial activity against different pathogens. Table 3 showed their most potential active compounds such as Caprylic and Myristic acids (Sayeed et al., 1996), Lupeol (Sen and Shukia, 1968), Rhamnetin-3-O- gentiobioside (Kumar *et al*., 1996), Oxanthraquinone (Vaishnav and Gupta, 1996).

Fig. 2: *Cassia fistula* L. in wild at Niyamgiri

Fig. 3: Flowers of *Cassia fistula* L.



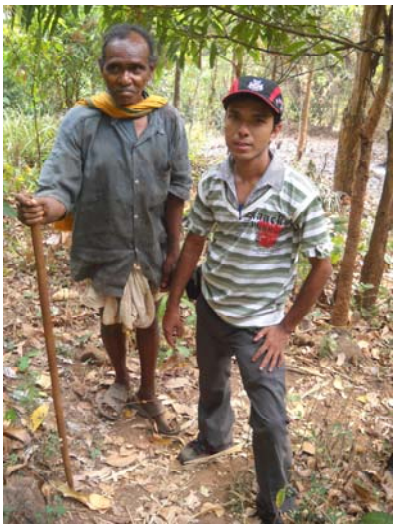


Fig. 4 & 5: Corresponding author with Dongaria Kandha during field survey at Niyamgiri

Conclusion

The findings of the field survey and literature emphasized that Cassia fistula L. has great potentiality to cure different diseases as well as used in other socio-cultural aspects among Dongaria Kandha. They have been using in cough, leprosy, liver disorder, Jaundice, rheumatic pains etc. As a socio-cultural, it is used as ornamental and in domestic utensils as well as agricultural tools. The present study emphasizes new incentive to the traditional system of healthcare and cultural traditions. Moreover the detail pharmacological studies are required and need pay attention towards the conservation of these types of plants species which will help in developing the strategy for conservation of biodiversity, which is essential for the coming generation.

Acknowledgements

Authors gratefully acknowledge Sr. Scientist Dr. R.C. Misra, NBPGR Base Centre Cuttack, for his valuable suggestions and identification of plants during field survey at Niyamgiri.

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