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Review Article

A meta analysis study on plants used by tribes of various districts of Odisha for treatment of liver disease

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ABSTRACT

This review article include study on plants used by different tribes of different districts of Odisha for the treatment of Liver disease. A Field work was carried out the months of June – July 2016. The ethano-medicinal survey was conducted particularly with Odisha tribes in different districts having forest pockets with the help of local medicine men, locally known as Ayurveda. Data were collected through structure questionnaires and observing during the field visits. In the present study the local population used a total of 20 plant species belonging to 10 families to cure a variety of diseases. Out of the 20 plants, 12 was herb, followed by trees and shrubs. The present study concluded that, the Odisha tribes of the study area possess rich knowledge on the medicinal plants and their utilization. Thus, the present study focuses on the documentation of the traditional knowledge of these valuable plants, which could enhance the potential of these medicinal plants to other communities as well and by understanding the importance, other communities can also helpful for conservation of these resources for further use.

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1. Introduction

The maximum population of India lives in rural areas and forests, and they use various parts of plants as food, medicine and other daily necessities.¹ The tribes of India used medicinal plants from prehistoric time, and they continue to provide useful tools for treating various ailments² More than 50,000 out of 4,22,000 flowering plants are used for medicinal purposes.³

The studies about traditional knowledge⁴ from many parts of the world have shown that the selection of traditional plants in practice is driven by both cultural and environmental factors. Ethnobotanical⁵ study looks at information about the tribes⁶ and people living in the areas especially traditional medicines⁷ that are prepared

from plants, food habits, traditional agricultural practices, housing, arts and crafts made outside of plant products⁸ etc. In India about 65% of the total and 85% of rural people⁹ rely on traditional knowledge of health care. India is one of the mega biodiversity countries in the world with rich vegetation of about 45000 artificial vegetation.¹⁰ In Odisha different types of herbal drugs are used by practitioners of different villages. Now a day herbal medicine is safest to use in compare to allopathic drugs. In Odisha different tribes¹¹ are found using different parts of plants as medicines for treatment of liver diseases. The tribes include Bonda, Bhuyan, Savara, Santhal, Ho, Saora, Kondha, Khadia, Juang¹² which are found in various villages and forest pockets located in Odisha.

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Table 1: Plant drugs used as single plant remedies against liver diseases by the tribal pockets of various districts of Odisha

Plant name	Family	Part used	Tribe reported	Model	Extract used	Parameters	Histopathology
Acacia catechu	Fabaceae	Gum	Juang, Bathudi	Acetaminophen induced	Seed and Bark extract	AST, ALP, ALT	Narcosis, Polymorphonuclear cells infiltration and sinusoidal congestion 13
Andrographis paniculata	Acanthaceae	Whole herb	Savara, Santhal, Kondha, Paroja	CCl ₄ induced	Whole plant	TP, Bilirubin, creatinine, urea, serum glucose	Increase in antioxidant enzymes in liver 14
Astercantha longifolia	Acanthaceae	Root, Seed	Ho, Khadia	Isoniazid and Rifampicin induced	Aerial parts	ALT, AST, SB, SAKP, TP, Total protein, albumin	hematoxylin-eosin-stained liver 15
Allium sativum	Liliaceae	Bulblet	Santhal, Kondha	Thioacetamide induced	Bulblets	ALT, AST, TOTAL BILIRUBIN	Severe hepatic damage 16
Apium graveolens	Apiaceae	Fruit	Bhumji	Paracetamol and thioacetamide induced	Seeds	SGOT, SGPT, SALP, SSDH, SGLDH, SBRN, HTG	Gross necrosis of centrilobular hepatocytes characterized by nuclear pyknosis and eosinophilic infiltration 17
Daucus carota	Apiaceae	Root	All plain tribes	CCl ₄ induced	Fresh tuber roots	SGOT, SGPT, LDH	stimulation of hepatic regeneration 18

Continued on next page

<i>Table 1 continued</i>								
Trachyspermum ammi	Apiaceae	Fruit	Bhumji	Ibuprofen induced	seeds	Percentage viability of cell line and cytotoxicity activity	liver metabolic functions and toxicity of xenobiotics	19
Azadiracta indica	Meliaceae	Stem bark	All plain tribes	CCl ₄ induced	Leaves	ALT and AST	mild congestion in some of the sinusoid	20
B. diffusa	Nyctaginaceae	Root, Young leaf	Bonda, Bhuyan	D-Galctosamine induced	Whole plant	AST, ALT, ALP, TP, TB, GGPT and total albumin.	analysis of oxidative stress-related biomarkers and in phosphate - buffered formalin	21
Boerhavia chinensis	Nyctaginaceae	Root	Bonda, Bhuyan	CCl ₄ induced	Whole plant	SGPT, SGOT, ALP and BIT	mild portal triaditis and focal semisolid congestion	22
Cassia occidentale	Caesalpinaceae	Stem bark	Mankind	CCl ₄ induced	Leaves	ALT, AST, and ALP	centrilobular necrosis, ballooning degeneration and vacuolation of hepatocytes	23

Continued on next page

<i>Table 1 continued</i>								
Cichorium intybus	Asteraceae	Root	Practitioners	CCl ₄ induced	Aerial parts	ALT, AST, TB, ALP	centrilobular hepatic necrosis, fatty change, apoptotic bodies and ballooning degeneration	24
Eclipta prostrata	Asteraceae	Root	Kondha	CCl ₄ induced	Whole plant	AST, ALT, ALP, ACP	Necrosis and membrane damage	25
Eclipta alba	Asteraceae	Root	Kondha	CCl ₄ induced	Whole plant	AST, ALP, ALT, TP, Triglyceride, Cholesterol, Phospholipids	Regulates hepatic microsomal drug metabolizing enzymes	26
Wedelia chinensis	Asteraceae	Root	Mankind	CCl ₄ induced	Whole plant	SGOT, SGPT, SLAP	necrosis and vacuolization	27
Citrullus vulgaris	Cucurbitaceae	Seeds	Savara	CCl ₄ induced	roots	ALT, AST, TG, HA, LN	Necrosis, lymphocyte, infiltration and fatty degeneration	28
Embelia ribes	Myrsinaceae	Seeds	Plain and tribes	Paracetamol induced	Whole plant	ALT, AST	Hepatic necrosis	29
Odenlandia corymbosa	Rubiaceae	Root	Bonda	Anti-tubercular drug induced	Whole plant	ALT, AST, ALP, SB	Hepatic necrosis	30
Glycomis pentaphylla	Rutaceae	Leaf	Kondha	Paracetamol induced	Leaves	ALT, AST, ALT, ALP, Total bilirubin and total protein	Necrosis, steatosis and fatty change of hepatic cells	31

Continued on next page

<i>Table 1 continued</i>								
Lawsonia inermis	Lythraceae	Root	Savara, Santhal	CCI4 induced	Leaves	SGPT, SGOT, SGPT, SAKP, SB	Centizonal necrosis and steatosis	32
Moringa oleifera	Moringaceae	Root	Plain and tribes	Anti-tubercular drug induced	Leaves	SGPT, SGOT, SGPT, SB	hepatic damage	33
Ocimum sanctum	Lamiaceae	Leaf	Kondha	Paracetamol induced	Leaves	serum proteins, albumin globulin ratio, alkaline phosphatase, transaminases	Reduction in sinusoidal congestion, cloudy swelling and fatty changes and regenerative areas of the liver	34
P. fraternus	Euphorbiaceae	Whole herb	Kondha	CCI4 induced	Leaves	SGOT, SGPT, ALP, Bilirubin and Cholesterol	Repair of hepatic tissue and stabilization plasma membrane	35
P. maderaspatensis	Euphorbiaceae	Whole herb	Kondha	CCI4 induced and thioacetamide induced	Whole plant	AST, ALT and LDH and liver lipid peroxides	Vacuolization, fatty changes and necrosis of hepatocytes	36
Phyllanthus amarus	Euphorbiaceae	Whole herb	Kondha	Ethanol induced	Aerial parts	ALT, AST, STG, HTG, tumor necrosis factor alpha, interleukin 1	Hepatocyte swelling, liver cell degeneration, active Kupffer cells and fatty liver	37

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<i>Table 1 continued</i>								
Ricinus communis	Euphorbiaceae	Root	Bhuyan	D - galactosamine induced	Leaves	ALT, AST, Alkaline phosphatase (ALP) and Malondialdehyde (MDA) level	congestion of cells, degeneration of central vein and portal vein, disruption of sinusoids and necrosis of hepatocytes	38
S. rhombifolia	Malvaceae	Root	Juang	Thioactamide and allyl alcohol induced	Roots	ALT, AST AND ASP	Necrosis and irreversible injury to liver tissue	39
Solanum indicum	Solanaceae	Root	Ho	CCl ₄ induced	Whole plant	ALP, SGOT, SGPT, TB	Liver cell necrosis with inflammatory collections and loss of cellular boundaries	40
Swertia angustifolia	Gentianaceae	Leaf	Santhal	Paracetamol induced	Aerial parts	GOT, GPT, ALP	Hepatic necrosis	41
Tephrosia purpurea	Fabaceae	Root	Saora	Thioacetamide induced	Aerial parts	ALP, AST, Total bilirubin	dose-dependent reduction of necrosis.	42
Tinospora cordifolia	Menispermaceae	Root	Kondha	Cadmium induced	Stem	SOD, CAT, GSH, GPx and GST	Vacuolization, fatty changes and necrosis of hepatocytes	43

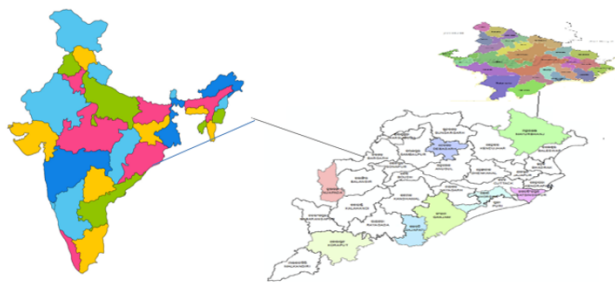


Figure 1: Different location of tribes in Odisha

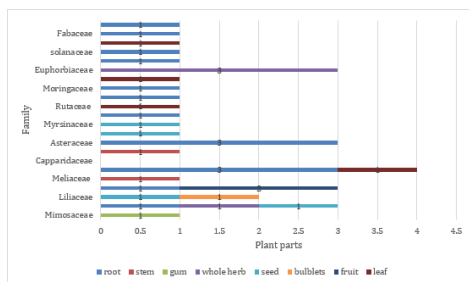


Figure 2: Plant parts of different family used in treatment of liver diseases

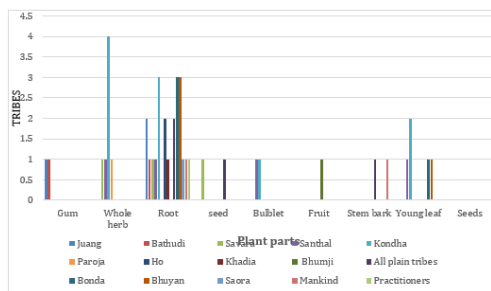


Figure 3: Plant parts used by different tribes used in treatment of liver diseases

These tribes use different parts of plant for treatment of liver diseases. Most of the tribal community⁴⁴ maintain their culture, beliefs, customs, and tradition. They collect woods from different plants and also cultivate cereals, pulses and also use plants for treatment of ailments.

Nowadays developing countries are increasingly in an effort to prepare remedies for local health care systems and extensive research is underway to test the vast ethnobotanical knowledge of the treatment of various ailments.⁴⁵ More than 65% of the world's population in developing countries are dependent on phytomedicine for their treatment of ailments due to the easy availability and low cost of herbal medicines as suggested by the World health Organization.⁴⁶ The national community is usually engaged in agriculture and has sufficient knowledge of

plants and their medicinal uses in the treatment of various foods⁴⁷ Due to deforestation and care less utilization of forests ethnomedicinal plants are under danger so it is essential to conserve valuable plants which are used as traditional medicine by the tribes⁴⁸ Odisha state is full of tribal people among which 62 tribes have been found to live in different forest pockets and districts of Odisha.⁴⁹ A good number of medicinal plants have been identify from the various forest pockets region of odisha generally in the Similipal bio sphere reserve situated in Mayurbhanj district in that so many tribals people are residing and they are using different types of plant medicines.⁵⁰ The use of traditional medicine remains wide spread in developing countries while the use of complementary alternative medicine (CAM) is increasing rapidly⁵¹.

1.1. Objectives and justification of research

1. The present meta-analysis effort aims to represent the documented valuable ethno medicinal practices related to liver disease management and provide a collective information regarding herbs used in liver diseases.
2. This report creates awareness among the herbal drug practitioners and scientific community by providing a comprehensive data related to respiratory disease management.
3. This report give ideas about herbal remedies used by traditional healers or tribe for liver disease in different parts of Odisha.

Data presented⁴⁸ here is based on the outcome of field collection trips conducted during the period of 2016-17, in tribal domination forest areas. At least 3 collection trips were made to each tribal pocket in three different seasons. Information on the plant species was gathered from village headmen, knowledgeable informants and traditional healers. Interpreters were sought to facilitate conversation. Plant specimens⁴⁹ were collected in the company of local informants to ensure that the proper plant had been obtained. The collected plants were correctly identified at IMMT Bhubaneswar, Odisha. All voucher specimens are deposited in the herbarium of the Institute.

SI. No Tribal plant name plant used Nano Paticles characterization Inferenc

2. Result and discussion

In Odisha medicinal plants possess a distinctive position in folk medicine as well as their importance position in the sociocultural and spiritual arena of rural and tribal life in Odisha. This has helped traditional medicine and the use of medicinal plants to become an important part of Odisha's cultural heritage. In Odisha, people in rural areas prefer treatment of various diseases by medicinal plants than by modern synthetic drugs which are expensive and because of difficulty to access medical services particularly in areas of

conflicts and political instability. This review present data on 20 herbs evaluated scientifically as hepatoprotective using experimental models. From this review, it is clear that the medicinal plants play an important role in the treatment of a variety of conditions including liver diseases. Most medicinal plants are widely distributed in the rural areas.

Gold and silver nanoparticles used for antimicrobial and hepatoprotective activity Acacia catechu.

3. Conclusion

3.1. In this review

This review shows that some medicinal plants of Odisha have crucial role in protecting liver from chemical injuries using in vivo and in vitro models. Herbal drugs in Odisha play a vital role in the primary health care since 90 % of the Odisha people use medicinal plants to treat different diseases including liver disorders

4. Source of Funding

None.

5. Conflict of Interest

None.

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