Traditional Herbal Remedies for Various Diseases Used By Tribals of Boudh District, Odisha, India for Sustainable Development.

C. R. Sahu¹*, R.K. Nayak², N. K. Dhal³

1. Department of Botany, Govt. College (Autonomous), Angul, Odisha-759143, India.  
   [E-mail id- crsmail4u@gmail.com; Tel: 9437451585]  
2. Department of Botany, J.K.B.K. Govt. College, Cuttack-753003, Odisha, India.  
   [E-mail id- nayak_ranindra@yahoo.co.in]  
3. CSIR, IMMT, Bhubaneswar – 751013, Odisha, India.  
   [E-mail id- nkdhal@immt.res.in]

An ethnobotanical survey was conducted to collect information about the medicinal plants used by different tribes in Boudh district of Odisha, India. Information presented here was gathered from various tribes of the district using an integrated approach of botanical collections and interview schedules. A total of 15 informants were interviewed and 35 ethnomedicinal plant species distributed in 27 families have been documented. Collected information depicts that Boudh tribes largely depend on medicinal plants to meet their primary health care needs.

**Keyword**: Ethnomedicinal, Tribes, Boudh, Diseases, Odisha.

1. Introduction
All the plants on the earth are important for humanity as human beings are influenced in various ways by plants and their products. Existence of mankind is impossible without plant kingdom as they provide balanced ecosystems, major source of nutrition, preventive aspects of medicine, primitive aspects of health and curative aspect of disease. The World Health Organisation (WHO) has estimated that 80% of the people in the developing countries of the world rely on traditional medicines and 85% of the traditional medicines involve the use of plant extracts [1].

India has ancient history of use of plants in the indigenous system of medicine (Ayurveda, Unani, Sidha) in the dates back over 5000 years. Ayurveda records over 8000 herbal remedies. India officially recognises over 2500 plants as having medicinal value and it has been estimated that over 6000 plants are used in traditional folk and herbal medicines [2].

Odisha, an eastern state of India is rich in floristic diversity as well as ancient folk literature, which may be trapped for information, since all systems of medicine have their roots in one way or the other in folk medicine and house hold remedies. As the rural Indian tribal villagers are deprived of modern health care system, they are highly dependent on traditional therapeutic methods of medicinal plants to meet their health care needs. The paper presents the use of folk medicinal plants against various
ailments of human beings of different tribes of Boudh districts of Odisha.

2. Study Area:
The district of Boudh is one of the centrally located districts of Odisha, bounded in the north by river Mahanadi and Angul district, east by Nayagarh and Angul, south by Kandhamal and Nayagarh, west by river Tel and Sonepur district. It lies between 20°22'-20°50' Northern latitudes and 83°34'-84°49' Eastern longitudes. The district is situated in the valley of rivers like Tel and Mahanadi. The total population of the district is 3,73,372 (Census, 2001), out of which scheduled caste population is 81,710 and scheduled tribe population is 46,557. The total area of the district is 3098 sq km., being located in the Eastern Ghats, it possesses rich and diversified floristic composition with 1277.17 Sq. Km. forest cover which is 40.51% of geographical area. The average annual rainfall ranges between 160-200 mm, minimum and maximum temperature is 8 °C and 44 °C and soil type is red sandy to red loamy in nature. The whole area can be divided into the northern plains and southern elevated plateau harbouring tropical dry-deciduous, moist-mixed deciduous and semi-evergreen type of forests. Sal (Shorea robusta Gaertn.) is the dominant tree species with its usual associates [3-4].
The forest rich area is inhabited chiefly by the tribals. The tribals have their unique forest dependent life style and traditional concept on diseases and medicines. They are living under varying geo-ecological setting of hills and forest areas and far away from modern convenience of life. They are food gatherers, hunters, forest-land cultivators and minor forest produce collectors. Out of 6 million tribals, about 62 notified scheduled tribes for the state of Odisha, Boudh district is represented by 25 ethnic tribal communities. A careful scrutiny reveal that the bulk of tribal population belongs to Kondh, Gond, Saura, Mirdhas, Mundas, Kharia, Kora, Kolha etc. with Kui as their lingua franca [6].
A detailed perusal of the ethnobotanical records, reveal that a number of outstanding botanists led several ethnobotanical studies in different parts of Odisha. From the literature it reveals that Boudh district with rich flora has remained ethno medicinally unexplored. Therefore present study has been undertaken to record less-known ethno medicines from different tribal communities of the district [7-13].

3. Materials and Methods:
Ethnobotanical surveys were conducted in different reserve forest namely Padmotola, Arakhpadar, Hatidhara, Aragarh, Mundesar, Podhal, Jamkhol as a part of research (Assessment of ethnic bioresources of Boudh district), among which 25 tribal dominated villages (randomly selected) of 10 Gram panchayats of Boudh district in different seasons from 2012 to 2013. Selected local inhabitants and the tribal medicine men (Gaon Disari) were interviewed to gather first-hand information on ethnomedicinal uses of plants.

These tribal village-heads & Gaon Disari were taken to the forests as guide-cum-informant for collection of voucher specimens. Standard methods necessary for taxonomic study have been followed for field collections. The plants were correctly identified with the help of Flora books. Matching of voucher specimens were done with the authentic herbarium at RRL-B and RPRC, Bhubaneswar. The herbarium specimens are preserved in the herbarium of the Department of Botany, Government (Autonomous) college, Angul, Odisha [14-17].
4. Results
The present paper documents the ethnomedicinal uses of 35 plant species belonging to 27 families from forest area of Boudh district in Odisha to treat 26 different ailments and diseases affecting tribals of this area. Most of the species are in local distribution and few species are in cultivation in gardens. Different parts of medicinal plants are used in preparation of medicinal pastes or concoctions, the leaves and stems were the most frequently used parts followed by whole plant, fruits, roots and latex or exudes. Most of the species are used to treat only one disease, only few diseases treated with more than one species. The plant species are arranged in alphabetical order according to scientific names for convenience. For each plant species given in the following table, details of scientific names, family, local names, locality with accession number and uses provided with the parts harvested for treatment and the manner of processing and administration.

Table 1: Ethnomedicinal Perspectives of Botanicals used by Tribals of Boudh District, Odisha.

<table>
<thead>
<tr>
<th>Botanical names\Family</th>
<th>Local names \Locality\Voucher no.</th>
<th>Mode of administration\Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Achyranthes aspera</em> L.</td>
<td>Ln. Apamaranga</td>
<td>About 20 gm of leaf juice is administered orally to the pregnant woman for easy delivery.</td>
</tr>
<tr>
<td>Amaranthaceae</td>
<td>Loc. Atalsara-005</td>
<td></td>
</tr>
<tr>
<td><em>Acorus calamus</em> L.</td>
<td>Ln. Bacha</td>
<td>About half teaspoonful of powder prepared from dried rhizome is taken twice daily to cure Asthma.</td>
</tr>
<tr>
<td>Araceae</td>
<td>Loc. Semiguda-602</td>
<td></td>
</tr>
<tr>
<td><em>Aerva lanata</em> (L.) Juss.</td>
<td>Ln. Paunsia</td>
<td>10 gm. of dried plant powder taken along with barley water thrice a day for about 45 days to dissolve Kidney stones &amp; reduces urethral burning sensation.</td>
</tr>
<tr>
<td>Amaranthaceae</td>
<td>Loc. Sankori-030</td>
<td></td>
</tr>
<tr>
<td><em>Aloe vera</em> (L.)Burm. f.</td>
<td>Ln. Ghikuanri</td>
<td>Mucilage is applied on the eye-lids before bed for 7 days against Cataract.</td>
</tr>
<tr>
<td>Liliaceae</td>
<td>Loc. Jabar-025</td>
<td></td>
</tr>
<tr>
<td><em>Bambusa arundinacea</em> (Retz.) Willd.</td>
<td>Ln. Kanta Baunsa</td>
<td>Leaves ground with seeds of Sesamum &amp;Trigonella and the paste mixed with honey is</td>
</tr>
<tr>
<td>Poaceae</td>
<td>Loc. Bhabpur-059</td>
<td></td>
</tr>
</tbody>
</table>
taken for 3 days to Abort pregnancy of 3 months.

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Common Name</th>
<th>Family</th>
<th>Location</th>
<th>Preparation/Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bauhinia purpurea L.</td>
<td>Barada</td>
<td>Caesalpiniaceae</td>
<td>Hatigarh-051</td>
<td>Dried seed paste mixed with coconut oil applied before bath eradicates the Lice.</td>
</tr>
<tr>
<td>Butea monosperma (Lam.) Taub.</td>
<td>Palasa</td>
<td>Fabaceae</td>
<td>Chhatrang-055</td>
<td>10-15 gm. of stem bark is made into juice mixed with pinch of pepper powder and cow milk administered once in a month to dissolve Kidney stone.</td>
</tr>
<tr>
<td>Calotropis gigantea R. Br.</td>
<td>Arakh</td>
<td>Asclepiadaceae</td>
<td>Kumari-052</td>
<td>2-3 leaves mildly heated with castor oil (Ricinus communis) and bandaged over the testicles every-day against Hydrocele.</td>
</tr>
<tr>
<td>Catharanthus roseus (L.) G. Don.</td>
<td>Sadabihari</td>
<td>Apocynaceae</td>
<td>Kusang-111</td>
<td>Leaf paste is applied on tumors and decoction given orally in 30 ml. twice a day for 1 month against Cancer.</td>
</tr>
<tr>
<td>Coccinea grandis (L.) Voigt</td>
<td>Kunduri</td>
<td>Cucurbitaceae</td>
<td>Nuapada-099</td>
<td>Handful of leaves ground and mixed with 10 ml. of country liquor given twice in a week against Heart ailments.</td>
</tr>
<tr>
<td>Curculigo orchioides Gaertn.</td>
<td>Talmuli</td>
<td>Hypoxidaceae</td>
<td>Padmotola-126</td>
<td>5 gm of powdered root tubers mixed with cow milk is administered twice a week against Seminal disorders and Leucorrhoea.</td>
</tr>
<tr>
<td>Diospyros melanoxylon Roxb.</td>
<td>Kendu</td>
<td>Ebenaceae</td>
<td>Talpadar-</td>
<td>Stem bark extract given to pregnant women in two</td>
</tr>
<tr>
<td>Plant Name</td>
<td>Latin Name</td>
<td>Family</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Eclipta prostrata (L.) L. Mant.</td>
<td>L. Bhringaraj</td>
<td>Asteraceae</td>
<td>Whole plant ground with black pepper, made into small pills. 2 pills twice a day for 3 days is administered to infants against Jaundice &amp; Fever.</td>
<td></td>
</tr>
<tr>
<td>Evolvulus alsinoides (L.) L. Sp.</td>
<td>L. Bichhamalia</td>
<td>Convolvulaceae</td>
<td>Dried plant powder administered in 2 spoonful twice a day for 2 months against Mental disorder.</td>
<td></td>
</tr>
<tr>
<td>Ficus racemosa L.</td>
<td>L. Dimiri</td>
<td>Moraceae</td>
<td>5-10 gm. of stem made into paste added with pinch of soil from termite mounds and made into tablets, given daily once for 1 month against Cancer.</td>
<td></td>
</tr>
<tr>
<td>Geniosporum tenuiflorum (L.) Merr.</td>
<td>L. Bano Tulasi</td>
<td>Lamiaceae</td>
<td>Leaf paste is applied on bitten area in Rat bite to get relief.</td>
<td></td>
</tr>
<tr>
<td>Gloriosa superba L.</td>
<td>L. Ognisikha</td>
<td>Liliaceae</td>
<td>Tuber extract 1 teaspoonful taken twice a day for 5 days is administered up to 3 months pregnancy for abortion.</td>
<td></td>
</tr>
<tr>
<td>Hedyotis corymbosa (L.) Lam.</td>
<td>L. Gharpoedia</td>
<td>Rubiaceae</td>
<td>Whole plant decoction given with a glass of butter-milk in 3 spoonfuls twice a day for 5 days against Jaundice.</td>
<td></td>
</tr>
<tr>
<td>Plant Name</td>
<td>Location</td>
<td>Part Used</td>
<td>Dosage &amp; Usage Details</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------</td>
<td>--------------------------------</td>
<td>------------------------</td>
<td></td>
</tr>
<tr>
<td><em>Hemidesmus indicus</em> (L.) R.Br.</td>
<td>Ln. Onontomul</td>
<td>Root extract mixed with honey</td>
<td>2 spoonfuls thrice a day for 2-3 weeks for Blood purification.</td>
<td></td>
</tr>
<tr>
<td>Periploceae</td>
<td>Loc. Sipori-508</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Holoptelea integrifolia</em> (Roxb.) Planch.</td>
<td>Ln. Dharanj</td>
<td>Stem bark decoction</td>
<td>20 ml. twice a day for 7 days against Rheumatism.</td>
<td></td>
</tr>
<tr>
<td>Ulmaceae</td>
<td>Loc. Mundipadar-230</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Justicia adhatoda</em> L.</td>
<td>Ln. Basango</td>
<td>3-4 leaves made into juice,added with water &amp; pinch of pepper powder, 2 spoonful given internally once in a day for a month against Bronchitis.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acanthaceae</td>
<td>Loc. Sagada-251</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Justicia gendarussa</em> Burm. f.</td>
<td>Ln. Kukurdanti</td>
<td>Decoction of leaves, tender shoots and flower tops are given in chronic Rheumatism.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acanthaceae</td>
<td>Loc. Kuchuru-521</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Lantana camara</em> L.</td>
<td>Ln. Naguari</td>
<td>Leaf decoction given in 2-3 spoonful twice a day for 4 days against Malaria.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbenaceae</td>
<td>Loc. Dhalapur-498</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Manilkara zapota</em> (L.) P. Royen</td>
<td>Ln. Sapota</td>
<td>Stem bark ground with black pepper &amp; made into powder, mixed with sugar candy &amp; cow milk and administered 2 spoonful twice a day for 3 months against Piles.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapotaceae</td>
<td>Loc. Ghantapada-545</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Mucuna pruriens</em> (L.) DC.</td>
<td>Ln. Baidonko</td>
<td>10-15 seeds were soaked overnight and the water is given in empty stomach twice a week against Bone fractures.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sapotaceae</td>
<td>Loc. Mundapada-296</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nymphaea pubescens</strong> Willd.</td>
<td>Ln. Nalikain</td>
<td>Rhizome ground with seeds of <em>Piper nigrum</em> and paste applied externally on neck against Goitre.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------</td>
<td>-------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nymphaeaceae</td>
<td>Loc. Gedrisahii-308</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Oxystelma esculenta</strong> (L.f.) R.Br.</th>
<th>Ln. Dudhialata</th>
<th>Leaves boiled in Brassica oil and applied on affected part against Scabies.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asclepiadaceae</td>
<td>Loc. Baghiapada-505</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Pedaliun murex</strong> L.</th>
<th>Ln. Gokshura</th>
<th>Leaves and fruits ground together into paste and is applied on testicles for a week in Hydrocele.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedaliaceae</td>
<td>Loc. Gundulia-499</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Plumbago zeylanica</strong> L.</th>
<th>Ln. Chitaparu</th>
<th>Root paste made into pills and 2 pills taken twice a day for 5 days before to Aborton pregnancy upto 3 months.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plumbaginaceae</td>
<td>Loc. Tutrung-341</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Plumeria rubra</strong> L.</th>
<th>Ln. Kathachampa</th>
<th>5-10 gm. of fresh root made into paste is mixed with ghee administered once a day against Stomach ache.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apocynaceae</td>
<td>Loc. Domda-336</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Semecarpus anacardium</strong> L. f.</th>
<th>Ln. Bhalia</th>
<th>Exudations from the ripened seeds is directly applied on affected parts against Neck &amp; joint pains.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anacardiaceae</td>
<td>Loc. Sampur-363</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Strychnos potatorum</strong> L. f.</th>
<th>Ln. Nirmala</th>
<th>Seeds rubbed with water and rock salt are applied in eye against Conjunctivitis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strychnaceae</td>
<td>Loc. Kanthisar-493</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Syzygium cumini</strong> (L.) Skeels</th>
<th>Ln. Jamu</th>
<th>Handful of stem bark is made into juice added with a pinch of pepper powder, along with cow milk, administered twice in a month to dissolve stone in Kidney.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myrtaceae</td>
<td>Loc. Kumari-529</td>
<td></td>
</tr>
<tr>
<td>Plant Name</td>
<td>Locality</td>
<td>Uses</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
<td>------</td>
</tr>
<tr>
<td>Tamarindus indica</td>
<td>Caesalpiniaceae</td>
<td>Ln. Kaiyan</td>
</tr>
<tr>
<td>Tylophora indica</td>
<td>Asclepiadaceae</td>
<td>Ln. Intrudia</td>
</tr>
</tbody>
</table>

5. Discussions
The use of plants for the existence of human being is as old a practice as the human race itself. The accumulation of knowledge of plant use however co-evolved with human civilization through the experimental use of plants, generation after generation. The results of the present study revealed that wild plants and their parts are widely used for different diseases. Tribal people have remarkable detailed knowledge of species identity and characteristics. Out of 62 tribes notified as scheduled for the state of Odisha, as many 25 are found in the district. A careful scrutiny reveals that the bulk of population belongs to Kondh. Some major ailments and diseases such as cancer, heart diseases, kidney-stones, skin diseases, abortion inducing drugs, respiratory diseases etc were being effectively treated using traditional knowledge and locally available plant resources. Ficus racemosa and Catharanthus roseus are used to treat cancer, Coccinea grandis is used to treat heart complaints, Butea monosperma and Syzygium cumini are used to treat kidney-stones, Geniosporum tenuiflorum and Tamarindus indica are used against poisonous bite.

In this study 35 plant species belonging to 27 families have been recorded. Many plant species belonging to families of Acanthaceae, Asclepiadaceae and Apocynaceae are frequently used. Healers in the area diagnose disease based on symptoms but sometimes they may also associate it to spirit. Therefore, preparation of medicines and treatment of diseases are sometimes accompanied by rituals. Tribal practitioner use plant products raw or taken as decoction\ infusion and paste. The most important aspect of the tribals in this region is that fresh plant material is used for the preparation of medicine. From this study it is clear that Boudh tribal possess innate ability to discern the character of plants and exploit the plant resources to meet their health care needs.

6. Conclusion
Due to the growing importance of ethnobotanical studies, it is necessary to collect the informations about the knowledge of traditional medicines, preserved in tribal and rural communities of various parts of Boudh before it is permanently lost. The anthropogenic unsustainable activities such as deforestation, habitat destruction, urbanization etc. may pose a serious threat to species. Hence, priority should be given to the following three measures.
1. Investigation related to taxonomy, chemical screening and documentation of the useful species and their habitats;
2. Initiation of conservation action works with appropriate measures involving local participation;
3. Implementation of awareness activities with integrated approach for sustainable development.

7. Acknowledgements
We are thankful to the D.F.O. of Nayagarh, Boudh and Range officers for their co-
operation and also acknowledge the help provided by the tribals and local medicinal practitioners of Boudh district for sharing information and traditional knowledge.

8. References