Traditional uses of medicinal plants by native people in Nawarangpur district, Odisha, India

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ABSTRACT

Medicinal plants still play a vital role in the primary healthcare of this local community. The present study deals with a comprehensive ethnobotanical survey of the traditional uses of plants in Nawarangpur district, Odisha, India. Data was collected through field assessments from traditional healers and locals by means of personal interviews and semi-structured questionnaires. Voucher specimens were collected following standard methods, identified with the help of pertinent floras and taxonomic experts and deposited in the Herbarium, RRL-B, India for future references. A total of 51 plants belonging to 35 families were recorded out of which major life forms were in the order of herbs, trees, shrubs and climbers. The leaf parts were widely used followed by root, bark, whole plant, seed, fruit, rhizome, petiole and latex. Traditional medicines also have the potential to form the basis of pharmaceutical drugs for the treatment of a range of diseases. Further, the information requires validation for further clinical usage.

Keywords: Ethnobotany, Medicinal plant, Traditional medicine, Nawarangpur district

INTRODUCTION

The plant kingdom represents a source of drugs and foods. Therefore, with the tendency in modern medicine to assimilate and re-assimilate natural remedies in common practice, under various forms, the potential of regional flora becomes important[1]. India is proud to be rich in biodiversity possess about 8% of the estimated biodiversity in the world with around 12600 species. It is one of the 12 mega biodiversity centers with 2 hot spots of biodiversity in the Western Ghats and North-eastern region. It’s also rich in ethnic diversity, there are about 67.37 million tribal people belonging to 537 tribal groups living in different geographical locations with various subsistence patterns [2-3]. These tribal groups living in diverse rich areas possess a wealth of knowledge and skills on the utilization and conservation of food and medicinal plants[4-5]. According to the World Health Organization (WHO) almost 65% of the world’s population has incorporated the value of plants as a methodology of medicinal agents into their primary modality of health care[6-7]. This estimate suggests that plant-derived drugs make up a significant segment of natural product-based pharmaceuticals.

Of the 30 districts of Orissa, Nawarangpur lying on the western part of Orissa bordering Chhattisgarh suffer from non-utilization of its forest resources though it has vast potentialities. Nawarangpur district harbors a rich diversity of ethnic botanical species, which generate considerable benefits from social and economic perspectives. Until now, people are preparing medicines from their available species of plants, which were used to treat common diseases. However, due to population pressure, accelerated urbanization, recurring drought, and deforestation, most of the medicinal plants are either destroyed or on the verge of extinction [9]. The aim of this study was, therefore, to identify and document the species of the plants associated with medicinal parts, methods of preparation of medicine and major uses in Nawarangpur district, Odisha, India.
MATERIALS AND METHODS

Description of Study Area
The ethno botanical study was conducted in the Nawarangpur district of the Odisha state of India during the year 2009-2012. It is lying between 19° 10' 42" and 20° 6' 12" N latitudes and between 81° 51' 30" and 82° 52' 36" E longitudes. With an area of 5290.1 sq. km, Nawarangpur is a landlocked district, surrounded on the west and north by Bastar and Raipur districts of Chhathisgarh state, and on the east and south by the Kalahandi and Koraput districts of Orissa. The whole district is more or less an elevated plateau of Eastern Ghats with occasional valleys and peaks ranging from 2,000 ft to 3,000 ft. (Figure 1). The soil of the district is of three different types; red, black cotton and lateritic soils. The climate of Nawarangpur is characterized by an equable temperature all through the year. May is the hottest month with mean daily maximum temperature of 39.62°C and the mean daily minimum of 11.7°C. The minimum temperature goes as low as 9.7°C during the middle of December and the maximum goes up 40.2°C during the middle of May. The average annual rainfall is 1423 mm.

Fieldworks and collection of data
The study involved intensive explorations and critical study of specimens for the last four years. The field trips were organized in such a way so as to cover all the areas of the district at regular intervals in different seasons between 2009 to 2012. As a result, it became possible to record the seasonal variations in the vegetation, including distributional patterns and collect most of the plants in different developmental stages of their life cycle. Plant specimens were collected in sets of four both in flowering and fruiting stages, taking due care to collect the healthy specimens. Field observations on phenology, habit, habitat, local names, local uses, frequency of occurrence, etc. were recorded in the field notebooks at the time of collection and the collected specimens were tagged with field book numbers.

Processing of voucher specimens for herbarium preparation and identification
The voucher specimens were brought to the laboratory and processed for herbarium specimen preparation. Care was taken to identify the specimens in the field itself while the specimens were fresh. Their identity was ascertained in the Herbarium with the help local flora, monographs, revisions and other taxonomic literature [10]. For confirmation, the Central National Herbarium (CNH), Howrah and Forest Research Institute Dehradun were consulted. Voucher specimens are preserved in the Herbarium of the Regional Research Laboratory, Bhubaneswar, Odisha.

RESULTS AND DISCUSSION
The results of the floristic survey are presented in table 1. A total of 51 plant species belonging to 35 families are reported. For each species the following Ethno botanical information was provided: taxon name, family, vernacular name, plant parts used, locality, flowering season, fruiting season, voucher number, their use in the treatment of diseases and growth form. In this study, members of the family Euphorbiaceae and Acanthaceae were dominant (Figure 2). Comparison of the plant parts used as a medicinal source indicates that the leaf predominates followed by
root, bark, whole plant, seed, fruit, rhizome, petiole and latex as shown in figure 3. The common diseases treated using medicinal plants are stomach ache, joint pain, scabies, lactation, rheumatism, infections, dysentery, diarrhea, bleeding of the nose, skin disease, migraine, snake bites, boils vomiting, fever, skin problems, cold & cough, toothache, stomach ache, wounds, burns, constipation, night blindness, blood dysentery, indigestion, diabetes, asthma and jaundice. Different types of preparation made from medicinally important plants included decoction, juice, powder, paste, oil and whole plant extract.

CONCLUSION

Herbal medicine has long been recognized as one of the oldest forms of remedies used by humans being. Many people in developing countries still rely on traditional healing practices and medicinal plants for their daily healthcare needs, in spite of the advancement in modern medicine. However, documentation of this indigenous knowledge of healing system still remains at minimum level. It thus becomes necessary to acquire and preserve this traditional system of medicine by proper documentation and identification of specimens. Ethnobotany can strengthen our links to the natural world. The findings of this study predicted that, most of the medicinal plants used by the community of study area contain medicinal substances in the root, leaf and stem part of surveyed plants.

In conclusion, Nawarangpur district is a hub of medicinal plants as revealed in this study. However, there is a need to scientifically ascertain the authenticity of the claimed use of these plants.
### Table 1- List of plants collected with their medicinal uses

<table>
<thead>
<tr>
<th>Sl/No</th>
<th>Botanical Name</th>
<th>Family</th>
<th>Vernacular name</th>
<th>Plant part used</th>
<th>Location (forest pockets)</th>
<th>Flowering season</th>
<th>Fruiting season</th>
<th>Voucher Number</th>
<th>Ethno botanical uses</th>
<th>Life form</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dillenia pentagyna Roxb.</td>
<td>DILLENIACEAE</td>
<td>Rai (O); Kirmilla (B).</td>
<td>Bark</td>
<td>deciduous forests of Umerkote forest range</td>
<td>Mar.-Apr.</td>
<td>May-Aug</td>
<td>Dhal &amp; Brahman, 9776.</td>
<td>Bark paste is applied against back-ache.</td>
<td>Tree</td>
</tr>
<tr>
<td>2</td>
<td>Annona squamosa L.</td>
<td>ANNONACEAE</td>
<td>Ata (O); Mandal (K).</td>
<td>Leaf</td>
<td>Tentalikhunti.</td>
<td>Mar.-Apr.</td>
<td>May-Sept.</td>
<td>Dhal &amp; Brahman, 9790.</td>
<td>Leaf paste is locally used against sprains.</td>
<td>Tree</td>
</tr>
<tr>
<td>3</td>
<td>Euryale ferox Salisb. in Kon. &amp; Sims</td>
<td>NYMPHAEACEAE</td>
<td>Indravati</td>
<td>leaf</td>
<td></td>
<td>Mar.- May</td>
<td>Dec-Jan</td>
<td>Dhal &amp; Brahman, 9765.</td>
<td>Warm leaf paste is massaged gently on joints to relieve the rheumatoidal inflammation and pain.</td>
<td>Herb</td>
</tr>
<tr>
<td>4</td>
<td>Capparis zeylanica L.</td>
<td>CAPPARACEAE</td>
<td>Asadua (O); Gaterna (K).</td>
<td>leaf</td>
<td>Podaguda.</td>
<td>Feb.-Mar</td>
<td>Mar.-June</td>
<td>Dhal &amp; Brahman, 9787.</td>
<td>Leaf paste is applied locally for swellings.</td>
<td>Climbing shrub</td>
</tr>
<tr>
<td>5</td>
<td>Cleome gynandra L.</td>
<td>CAPPARACEAE</td>
<td>Arakasago (O); Chamari (K).</td>
<td>Leaf &amp; young shoot</td>
<td>Pannabera, Beheda</td>
<td>Feb.-May</td>
<td>June-Sept</td>
<td>Dhal &amp; Brahman, 9790.</td>
<td>Leaf juice (warm) is used as cardrops to treat earache.</td>
<td>Herb</td>
</tr>
<tr>
<td>6</td>
<td>Cleome viscosa L.</td>
<td>CAPPARACEAE</td>
<td>Anasorisho, Banoorisho (O); Hurhur (K).</td>
<td>Root &amp; leaf</td>
<td>Kapurdam.</td>
<td>May-June.</td>
<td>July-Oct</td>
<td>Dhal &amp; Brahman, 9581.</td>
<td>Crushed leaves are used against scorpion-biting.</td>
<td>Herb</td>
</tr>
<tr>
<td>7</td>
<td>Homalium nepalense Benth. J. Linn.</td>
<td>FLACOURTIACEAE</td>
<td>Dhaniri (B)</td>
<td>leaf</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The leaf paste is used like ointment for healing wounds</td>
<td>Tree</td>
</tr>
<tr>
<td>8</td>
<td>Portulaca oleracea L.</td>
<td>PORTULACACEAE</td>
<td>Bad luniya (O)</td>
<td>leaf</td>
<td>Kodinga</td>
<td>July-Sept</td>
<td>Oct.-Jan</td>
<td>Dhal &amp; Brahman, 9797</td>
<td>Leaf juice is taken twice a day for throat infections.</td>
<td>Herb</td>
</tr>
<tr>
<td>9</td>
<td>Abrus crispus Wall.</td>
<td>MALVACEAE</td>
<td>Usungid (K).</td>
<td>root</td>
<td>Raighara</td>
<td>Aug.-Sept</td>
<td>Oct.-Nov</td>
<td>Dhal, 9304</td>
<td>The root paste is used externally for scorpion sting.</td>
<td>Shrub</td>
</tr>
<tr>
<td>10</td>
<td>Theophrasia lampas (Cav.) Dalz. &amp; Gibbs</td>
<td>MALVACEAE</td>
<td>Bana kappa (O); Birkasom (K).</td>
<td>leaf</td>
<td>Barli</td>
<td>Aug.-Oct.</td>
<td>Nov.-May.</td>
<td>Dhal, 9128</td>
<td>Leaf paste is applied externally on swollen joints.</td>
<td>Tree</td>
</tr>
<tr>
<td>11</td>
<td>Trumpetta rhomboidea Jacquem.</td>
<td>TILIACEAE</td>
<td>Chikiti (O); Chitka (P).</td>
<td>leaf</td>
<td>Indravati</td>
<td>July-sept</td>
<td>Aug.-Oct.</td>
<td>Dhal 9829</td>
<td>Leaf decoction (one teaspoonful, 3 times daily) is administered for bleeding piles.</td>
<td>Herb</td>
</tr>
<tr>
<td>12</td>
<td>Oualis coriulata L.</td>
<td>ZYGOPHYLLACEAE</td>
<td>Ambiliti (O); Changeri (G); Indian sorrel (E).</td>
<td>leaf</td>
<td>Bijayapadar.</td>
<td>Sept.-Feb</td>
<td>Sept.-Feb</td>
<td>Dhal &amp; Brahman, 9309</td>
<td>Leaf juice mixed with honey and ginger is administered against irregular cycle.</td>
<td>Herb</td>
</tr>
<tr>
<td>13</td>
<td>Ailanthus excelsa Roxb.</td>
<td>SIMAROUBACEAE</td>
<td>Mahal, Maha limba (O).</td>
<td>leaf</td>
<td>Medna.</td>
<td>Feb.-Mar.</td>
<td>Apr.-July.</td>
<td>Dhal &amp; Brahman, 9440</td>
<td>Leaf decoction (two teaspoonfuls, two times daily) is administered with honey to check rheumatic fever.</td>
<td>Tree</td>
</tr>
<tr>
<td>14</td>
<td>Lannea coromandelica (Houtt.) Merr.</td>
<td>VITACEAE</td>
<td>Mobi (O); Nanam (K); Doka (P).</td>
<td>leaf</td>
<td>Podaguda &amp; Singisari</td>
<td>Mar.-Apr.</td>
<td>Apr.-June.</td>
<td>Dhal &amp; Brahman, 9207, 9454.</td>
<td>Leaf paste is massaged against swelling joints. Bark decoction after boiling is gargled against throat infection.</td>
<td>Tree</td>
</tr>
<tr>
<td>15</td>
<td>Aeschynomene indica L.</td>
<td>FABACEAE</td>
<td>Sola (O).</td>
<td>root</td>
<td>Raighara.</td>
<td>July-Oct</td>
<td>July-Oct</td>
<td>Dhal &amp; Brahman, 9306.</td>
<td>Powdered root with 2 black pepper is given thrice a day for one week to relieve from gastric pain</td>
<td>Herb</td>
</tr>
<tr>
<td>16</td>
<td>Indigofera tinctoria L.</td>
<td>FABACEAE</td>
<td>Nilii (O).</td>
<td>Whole plant</td>
<td>Nabaranpaur</td>
<td>Aug.-Sept</td>
<td>Oct.-Jan.</td>
<td>Dhal, 9707</td>
<td>The plant juice (1 tea spoon full) is administered before breakfast in empty stomach for 15 days against bronchitis</td>
<td>Herb</td>
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<tr>
<td>No.</td>
<td>Plant Name</td>
<td>Family</td>
<td>Part Used</td>
<td>Collection Season</td>
<td>Medicinal Use</td>
<td>Source</td>
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<td>17</td>
<td>Millettia extensa (Benth.) Baker</td>
<td>FABACEAE</td>
<td>root</td>
<td>Mar.-June</td>
<td>Powdered root (10gm) mixed with honey is administered once a day for 3 days against wormicides</td>
<td>Shrub</td>
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<td>18</td>
<td>Ichnocarpus frutescens (L.) R.Br.</td>
<td>APOCYNACEAE</td>
<td>root</td>
<td>Aug.-Dec</td>
<td>Root decoction (5 ml) is given twice a day for one month to improve memory power. Decoction of leaves is given in fever.</td>
<td>Shrub</td>
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<tr>
<td>19</td>
<td>Pergularia daemia (Forssk.) Chiov.</td>
<td>ASCLEPIADACEAE</td>
<td>leaf</td>
<td>July-Sept.</td>
<td>Leaf juice mixed with country liquor is given to male person more than 40 years to increase sexual ability</td>
<td>Herb</td>
<td></td>
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<tr>
<td>20</td>
<td>Ichnocarpus frutescens (L.) R.Br.</td>
<td>APOCYNACEAE</td>
<td>Whole plant</td>
<td>Sept.-Oct.</td>
<td>5 ml plant juice is taken twice a day for 15 days as blood purifier</td>
<td>Herb</td>
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<tr>
<td>21</td>
<td>Cordia obliqua Willd.</td>
<td>ERIACEAE</td>
<td>leaf</td>
<td>Feb.-Apr</td>
<td>Leaf decoction with common salt is given twice a day for one week against cough &amp; cold</td>
<td>Tree</td>
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<tr>
<td>22</td>
<td>Trichodesma indicum (L.) R.Br</td>
<td>BORAGINACEAE</td>
<td>root</td>
<td>Aug.-Feb</td>
<td>Root paste is locally applied against sprain</td>
<td>Herb</td>
<td></td>
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<tr>
<td>23</td>
<td>Canscora decussata (Roxb.) Schult. &amp; Schult.</td>
<td>GENTIANACEAE</td>
<td>leaf</td>
<td>Sept.-May</td>
<td>Root paste is locally applied for scabies</td>
<td>Shrub</td>
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<tr>
<td>24</td>
<td>Solanum virginianum L.</td>
<td>SOLANACEAE</td>
<td>root</td>
<td>Sept-May</td>
<td>Seeds fried in oil are applied against tooth-ache. Seeds are expectorant and hence used in asthma</td>
<td>Shrub</td>
<td></td>
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<tr>
<td>25</td>
<td>Linnophila indica (L.) Druce</td>
<td>SCROPHULARIACEAE</td>
<td>leaf</td>
<td>Sept-May</td>
<td>Leaf juice mixed with mustard oil is applied on scabies. Leaf decoction with honey is given to treat fever, headache and body ache.</td>
<td>Herb</td>
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<tr>
<td>26</td>
<td>Barleria prismiitis L.</td>
<td>ACANTHACEAE</td>
<td>leaf</td>
<td>Sept.-May</td>
<td>Leaf decoction 2 tsp mixed with honey is taken twice a day for 10 days against bronchial asthma</td>
<td>Shrub</td>
<td></td>
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<tr>
<td>27</td>
<td>Barleria strigosa Wild.</td>
<td>ACANTHACEAE</td>
<td>leaf</td>
<td>Sept.-May</td>
<td>Leaf decoction 2 tsp mixed with honey is taken twice a day for 10 days against bronchial asthma</td>
<td>Shrub</td>
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<tr>
<td>28</td>
<td>Justicia adhatoda L.</td>
<td>ACANTHACEAE</td>
<td>leaf</td>
<td>Oct. - Dec</td>
<td>Leaf juice in coconut oil is applied externally to cure pimples.</td>
<td>Shrub</td>
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<tr>
<td>29</td>
<td>Thunbergia fragrans Roxb.</td>
<td>ACANTHACEAE</td>
<td>leaf</td>
<td>Oct. - Dec</td>
<td>Leaf decoction (2 spoonfull) is given twice a day for 2 days against pneumonia</td>
<td>Shrub</td>
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<tr>
<td>30</td>
<td>Clerodendrum inerme (L.) Gaertn.</td>
<td>VERBENACEAE</td>
<td>leaf</td>
<td>Sept.-Mar.</td>
<td>Leaf juice (warm) is prescribed as an ear drops to treat earache.</td>
<td>Shrub</td>
<td></td>
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<tr>
<td>31</td>
<td>Polygonum benghalensis (Burm.f.) Kuntze</td>
<td>LAMIACEAE</td>
<td>leaf</td>
<td>Sept.-Apr</td>
<td>Leaf decoction is taken twice a day for 2 days against menorrhagia</td>
<td>Herb</td>
<td></td>
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<tr>
<td>32</td>
<td>Mirabilis jalapa L.</td>
<td>NYCTAGINACEAE</td>
<td>leaf</td>
<td>Sept.-Apr</td>
<td>Leaf juice (warm) is prescribed as an ear drops to treat earache.</td>
<td>Shrub</td>
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<tr>
<td>33</td>
<td>Amaranthus spinosus L.</td>
<td>AMARANTHACEAE</td>
<td>leaf</td>
<td>Sept.-Apr</td>
<td>Leaf juice (10 ml) is given twice a day for 10 days against menorrhagia</td>
<td>Herb</td>
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<tr>
<td>34</td>
<td>Polygonum hybacinum L.</td>
<td>POLYGONACEAE</td>
<td>Whole plant</td>
<td>Dec. - May</td>
<td>Plant powder (10 gm) is taken twice a day for 2 days against pneumonia</td>
<td>Herb</td>
<td></td>
<td></td>
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<tr>
<td>No.</td>
<td>Species</td>
<td>Family</td>
<td>Common Names</td>
<td>Habitat</td>
<td>Uses</td>
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<tr>
<td>35</td>
<td>Antidesma acidum</td>
<td>EUPHORBIACEAE</td>
<td>Nunnunia (O); Mattam (K); Matha-aark (G).</td>
<td>Fruits</td>
<td>Raighara Mar.-Apr May-Dec Dhal, 9290. Syrup made out of fruits is administered twice a day for 7 days against blood dysentery</td>
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<tr>
<td>36</td>
<td>Bridelia retusa (L.) Spreng</td>
<td>EUPHORBIACEAE</td>
<td>Kasi (O); Kana (K); Khooj (R); Manga (P).</td>
<td>bark</td>
<td>Pannabera &amp; Raighara Aug.-Jan. Aug.-Jan. Dhal &amp; Brahmmam, 9366, 9319. The bark (5 gm) is grounded with 9 black peppers is taken against urinary congestion</td>
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<tr>
<td>37</td>
<td>Euphorbia hirta L.</td>
<td>EUPHORBIACEAE</td>
<td>Chita-katesi (O); Pasitoa (K, P).</td>
<td>latex</td>
<td>Bijayapadar most part of the year most part of the year Dhal, 9059. The latex is applied on eye to treat redness of eye Shrub</td>
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<tr>
<td>38</td>
<td>Pedilanthus thymoloides (L.) Poit</td>
<td>EUPHORBIACEAE</td>
<td>Khirsagar, Kharsiju (O).</td>
<td>leaf</td>
<td>Chandahandi Jan.-May Jan.-May Dhal, 9354. Leaf paste heated in Caster oil is applied to reduce the swelling and associated pain due to sprains. shrub</td>
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<td>39</td>
<td>Ficus racemosa L.</td>
<td>MORACEAE</td>
<td>Dimiri (O); Taya (K); Dumbiri (B.G.).</td>
<td>Whole plant</td>
<td>Sanatemara Oct.-Apr Oct.-Apr Dhal, 9513. The milky juice of the plant (5 ml twice a day for 10 days) is given against piles. tree</td>
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<tr>
<td>40</td>
<td>Ficus religiosa L.</td>
<td>MORACEAE</td>
<td>Aswatta, Usto (O); Pippala (K); Jari (P); Pipal Tree (E).</td>
<td>bark</td>
<td>Bhejiguda Oct.-Mar. Oct.-Mar. Dhal, 9503. Powdered bark (5 gm) is taken with water once daily for 7 days against leucorrhoea. tree</td>
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<td>41</td>
<td>Zingiber purpureum Rosc.</td>
<td>ZINGIBERACEAE</td>
<td>Rana ada (O)</td>
<td>rhizome</td>
<td>Podaguda Aug.-Oct Oct.-Nov Dhal, 10027. Powdered rhizome is taken as an antidote to snake-bite herb</td>
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<td>42</td>
<td>Caryota urens L.</td>
<td>ARECACEAE</td>
<td>Salapa (O); Ateka (K); Salpa (O).</td>
<td>stem</td>
<td>Khonda Apr.-Aug Oct.-Feb. Dhal &amp; Brahmmam, 9158. The juice is collected by incising the stem. A glass of fresh juice is given to nursing mothers to enhance lactation. tree</td>
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<td>43</td>
<td>Ludwigia octovalvis (Jacq.) Raven</td>
<td>ONAGRACEAE</td>
<td>Bhukura (O); Daliju (K)</td>
<td>Petiole</td>
<td>Raigharan Umerkote July-Sept. Oct.-Mar Dhal &amp; Brahmmam, 9160, 9307. Petiole juice is put in eyes against eye diseases like conjunctivitis. Herb</td>
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<td>44</td>
<td>Gilosis lotoides L.</td>
<td>MOLLUGINACEAE</td>
<td></td>
<td>Leaf</td>
<td>Kapur dam Feb.-May Feb.-May Dhal, 9589. Leaf juice (5 ml) is given twice daily for three days against stomach pain of the children. Herb</td>
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<td>45</td>
<td>Hedysotis corymbosa Lam.</td>
<td>RUBIACEAE</td>
<td>Gharpodia (O).</td>
<td>Whole plant</td>
<td>Chikli June-Sept. June-Sept. Dhal, 9904. Plant decoction is given 2 times a day for 15 days against dyspepsia Herb</td>
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<tr>
<td>46</td>
<td>Hedysotis herbacea L.</td>
<td>RUBIACEAE</td>
<td>Gharpodia (O).</td>
<td>Whole plant</td>
<td>Singisari July-Dec July-Dec Dhal, 9905. Plant decoction with common salt (2:1) is given once a day for migraine. Herb</td>
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<td>47</td>
<td>Ipura pavetta Andr.</td>
<td>RUBIACEAE</td>
<td>Telkuria (O); Peter(K).</td>
<td>Root</td>
<td>Barli Feb.-Mar Feb.-Mar Dhal &amp; Brahmmam, 9124. Root paste mixed with the root paste of Satabari (Asparagus racemosus Wild.) is administered twice a day for 7 days against urinary infection. shrub</td>
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<td>48</td>
<td>Eclipta prostrata (L.) L.</td>
<td>ASTERACEAE</td>
<td>Bhringraj(O); Kamri (K).</td>
<td>Leaf</td>
<td>Dasarathpur July-Nov July-Nov Dhal, 9265. Leaf juice is applied on head for better hair growth.4-6 leaves are made into paste with stem bark of Kochila (Styrchnos nuxvomica ) and applied locally on boils for suppuration herb</td>
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<td>49</td>
<td>Giranga maderaspatana (L.) Poir.</td>
<td>ASTERACEAE</td>
<td>Agni kamari (O).</td>
<td>Root</td>
<td>Umerkote. Jan.-Apr Jan.-Apr Dhal, 9173. About 1 cm long root is chewed after meal for 15 days against dyspepsia herb</td>
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<td>50</td>
<td>Ardisia solanacea Roxb.</td>
<td>MYRSINACEAE</td>
<td>Kadna, Kantapengu (O); Ridika(K).</td>
<td>Root</td>
<td>Tentulikhunti. Mar.-June Oct.-Jan Dhal &amp; Brahmmam, 9034. Root bark paste mixed with dried flower powder of Kanchant and goat milk (4:3:4) is administered twice a day for 15 days against asthma tree</td>
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<td>51</td>
<td>Diospyros melanoxylon Roxb.</td>
<td>EBENACEAE</td>
<td>Kendu (O); Duringi (K); Terel (G).</td>
<td>Flower</td>
<td>Birjadalapahada. Apr-May Feb.-Mar. Dhal &amp; Brahmmam, 9600. Flower powder (10 gm) mixed with black Pepper 3-2 is taken twice a day for 15 days against leucorrhoea tuberculous tree</td>
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Acknowledgement
The authors would like to thank the local people for their valuable indigenous knowledge transfer. We are also thankful to the Director, Institute of Minerals and Materials Technology, CSIR, Bhubaneswar for providing infrastructure to carry out research work successfully.

REFERENCES