

Ethnomedicinal survey of some wetland plants of South Orissa and their conservation

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Results of an ethnomedicinal survey of wetlands of Eastern Ghat region of Orissa are presented. Data and specimens were collected during 2005-2008 of field study. Field study consisted of plant collection and interview with the local traditional healers. The result revealed that 48 wetland plants under 40 genera and 23 families were under use by the local inhabitants against 47 different ailments. The communication reports for the first time 29 taxa with new medicinal uses. The survival of these native wetland species is threatened and hence attention on the wetland resources especially those having economic value is warranted.

Keywords: Ethnomedicine, Wetland plants, Medicinal plants Orissa

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Out of 30 districts of Orissa, South Orissa consists of 7 districts (Ganjam, Gajapati, Rayagada, Koraput, Nawrangpur, Malkangiri and Kandhamal) with a diversified geographical status extending from coast to interior mountainous areas (Fig. 1). The climate of the area is sub-tropical, hot and dry in summer, dry and cold in winter. The region constitutes a part of the Eastern Ghats of India. Many wetlands including several small and large river systems, lagoons, creeks, numerous natural and man made lakes, reservoirs and ponds are distributed in these districts. The total wetland area of the state was 3,48,205.25 ha in post-monsoon and 2,94,068.35 ha in pre-monsoon period, of which in the study area, it is 49,528 ha in post-monsoon and 36,965 ha in pre-monsoon period, which are 14% and 12%, respectively of the total state wetland area¹. These wetlands are rich in plant resources. Traditionally, the local inhabitants have been using wetland plants against the diseases they suffer from. The importance of traditional medicine that provides health service to about 80% of world population has been realized recently². Due to industrialization, urbanization, unmanaged exploitation, and also removal of plant materials for fish culture, many of the wetland medicinal plants of the area are vanishing rapidly. Due to non-availability of medicinal plants, the use of ethnomedicine is also

reducing to some extent. However, the ethnomedicinal knowledge is still available with the traditional healers that are to be codified before the knowledge is lost forever. Although several attempts have been made, in the past, to collect information on ethnomedicinal uses of plants of the state an attempt has been made to collect the ethnomedicinal information on wetland plants available in South Orissa³⁻¹⁷. This is a part of the project undertaken to survey and evaluate the wetland plant biodiversity and resources of south Orissa during 2005-2008.

Methodology

For the study, wetland areas of 7 districts of South Orissa under study were visited several times during 2005-2007 to collect information on the ethnomedicinal uses of wetland plants and their distribution. The traditional healers were identified and interviewed extensively during the study. In the study, questionnaire was used to collect information on the local name of the plants, parts used, methods of preparation of the medicine, and approximate doses¹⁸. As most of the traditional healers are illiterate, structural interviews were conducted using a series of predetermined questions. The data collected is based on first hand information. Plant specimens were collected in the company of at least one traditional healer to make sure that the proper plant has been obtained. The collected plant specimens were

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processed, dried and herbarium specimens were prepared. Voucher specimens of the collected plant species were deposited in the Herbarium of the PG Department of Botany, Berhampur University (BOTB). The specimens were identified with the help of the local floras. The plants are enumerated as per their botanical name along with family, local name(s), and medicinal uses.

Observations

Most of the traditional medicines were prepared by the healers from fresh materials collected from the wild. However, in some cases, sun dried stored plant materials, which were collected during their availability, were used. Dried plant materials were mostly powdered and used in preparation of the medicine. The study provides information on 48 wetland plant species under 40 genera and 23 families. Asteraceae contributed maximum number of species. Of these, 11 species are monocotyledons and 36 are dicotyledons; one species belongs to pteridophyta. Of the total species, 27 species are wetland hydrophytes or associate hydrophytes, 9 species are emergent hydrophytes, 6 species are attached hydrophytes with floating shoots, one species belongs to free floating hydrophytes and 5 species are attached hydrophytes with floating leaves. Some of the described species are under cultivation since long and are used as medicine. Totally, 47 disease/ disease groups were treated by these wetland plants in the study area. The important disease/disease group is asthma, bronchitis, eczema, madness, gonorrhoea, spermatorrhoea, leprosy, malaria, cardiac problem, and rheumatism. A maximum of 12 plant species were used against skin diseases, followed by 8 species each against diarrhoea and dysentery, head reeling and headache categories. For rheumatism, 7 plant species were used, 5 species each were used against eye disease, cold and cough, boils and biliousness. The plant species were used either individually or in combination with other plant parts or animal products. 13 plant species were used in association with the main plants, while cow urine, milk, ghee, honey, sugar candy, mustard oil, coconut oil, camphor and common salt, etc. also were mixed or prescribed with the main medicine. Medicinal use of wetland plants are:

Acmella calva (DC.) Jansen (Asteraceae) Or: *Panibisalyakarani*

Uses: Fresh leaves and flowers paste is taken with cow ghee to cure throat infection. Paste of leaves and flowers is hold in mouth to cure toothache.

Acorus calamus L. (Araceae) Or: *Bacha*

Uses: Dried rhizome is chewed twice daily in empty stomach to cure dysentery. Rhizome powder is taken in empty stomach for the treatment of epilepsy; also given to cure asthma. To increase appetite, powder is taken once a day in the morning. Rhizome paste is taken to improve memory power. Juice in small doses is given to children to speak easily. Dried rhizome is chewed to improve voice quality or clear tone. Rhizome juice is dropped into the eye for treating eye diseases. Paste of soft tender root, arising from the nodes is applied on affected area to relief tooth pain due to carries.

Aeschynomene aspera L. (Fabaceae) Or: *Solo* (Fig. 2)

Uses: Aerial part juice is given to cure cough and cold fever. Dried young shoot powder with half teaspoon powdered sugar candy is given to increase the consistency of semen.

Alternanthera philoxeroides (Mart.) Griseb (Amaranthaceae) Or: *Ghoda madaranga*

Uses: Young shoot paste with black pepper is prescribed to cure acute cough. Leaves with a pinch of salt are orally administered to cure intestinal worms.

Alternanthera sessilis (L.) DC. (Amaranthaceae) Or: *Madaranga*

Uses: Cooked leaf is given to increase the flow of bile in the intestine and to nourishing mothers to stimulate lactation. Fresh leaf juice with honey is prescribed to reduce body temperature and to treat leucorrhoea.

Ammannia baccifera L. (Lythraceae) Or: *Ramdhuni*

Uses: Leaf juice with honey is given in empty stomach to cure typhoid. Leaf paste with common salt is applied on the effected areas to cure skin diseases such as scabies, ringworm, skin itching, etc.

Bacopa monnieri (L.) Pennell (Scrophulariaceae) Or: *Bramhi*

Uses: Root juice is dropped into the eyes to cure cataract. Leaf juice along with honey is taken for the treatment of epilepsy. Leaf decoction is administered to the babies suffering from asthma and constipation. Paste of whole plant with sugar candy is given as astringent. Plant juice is applied on scalp before bath

to cure head reeling; also applied on minor injuries as an antiseptic. Leaves kept on a cotton cloth are warmed gently on the flame are applied on the chest of the patient suffering from cough, cold and different types of nasal congestion. *Bramhi* oil prepared from plant juice is applied on scalp to treat head reeling, for cooling brain and enhancing memory power.

Caesulia axillaris Roxb. (Asteraceae) Or: *Jamjuria* (Fig. 3)

Uses: Whole plant paste with camphor and mustard oil is applied on chest and throat to cure cold, cough and nasal congestion. Paste of the inflorescence with black pepper and cow milk is given to cure dysentery. Whole plant extract is given to cure malaria.

Centella asiatica (L.) Urb. (Apiaceae) Or: *Thalkudi*

Uses: Leaf juice mixed with honey is taken in empty stomach to enhance memory power. Leaf juice with cow milk is administered in empty stomach for treating cough and cold. Leaf paste is applied on wounds and minor injuries for healing. Leaf juice with sugar candy is prescribed for treating headache. Plant is cooked as vegetable and taken for for treating madness.

Centipeda minima (L.) A. Br. & Asch. (Asteraceae) Or: *Nakchinka*

Uses: Dried leaf powder with mustard oil is inhaled to remove nasal congestion. Fresh plant paste is applied externally to subside body swelling and inflammation.

Coix aquatica Roxb. (Poaceae) Or: *Dango gargara*

Uses: Root paste with cow urine and black pepper made into small tables are given to cure painful urination and menstrual complaints.

Coldenia procumbens L. (Boraginaceae) Or: *Mohinibhuta, Gondhrilata*

Uses: Paste of the whole plant is applied around the boils as suppurate and to get relief from pain and swelling.

Commelina benghalensis L. (Commelinaceae) Or: *Kanasiri*

Uses: Warm leaf juice is dropped in ear to get relief from earache. Leaf juice with coconut oil is applied externally to cure leprosy and skin inflammations. Fried leaves are given as leafy vegetable to cure constipation. Warm dried leaf decoction is given to cure rheumatic pain.

Commelina diffusa Burm. f. (Commelinaceae)

Uses: Water extract of fresh aerial part is applied externally to heal burn injuries, itches and boils.

Commelina erecta L. (Commelinaceae) Or: *Kanseera*

Uses: Leaf pasted along with seeds of *Brassica campestris* var *sarson* is applied on the affected area to subside rheumatic swelling.

Eclipta prostrata (L.) L. (Asteraceae) Or: *Kesadura*

Uses: Leaf juice extracted with the help of traditional mortar and pestle, called *silo* is used for the preparation of *Bhringaraj* oil and also applied directly on scalp for better hair growth and darkening of hair. Leaf juice is prescribed to cure mental disorders; poured into the nostril to get relief from headache. A mixture of leaf juice and a pinch of table salt is applied on eczema for healing. Leaf decoction is applied on the affected area to relief pain of scorpion sting.

Enydra fluctuans Lour. (Asteraceae) Or: *Hidimichi* (Fig. 4)

Uses: Leaf paste with cow milk is given in empty stomach to stop excess bile secretion. Paste of leaves coated with warm mustard oil is applied on chest to cure bronchitis.

Glinus oppositifolius (L.) A. DC. (Molluginaceae) Or: *Pitasago*

Whole plant paste is applied externally against various types of skin diseases such as scabies, itches, etc.

Grangea maderaspatana (L.) Poir. (Asteraceae) Or: *Panijhari, Agnikumari* (Fig. 5)

Uses: Plant Paste with cow milk and sugar candy is given to cure menstrual disorders. Leaf paste with honey is given to cure stomach disorders.

Heliotropium indicum L. (Boraginaceae) Or: *Hatisundha*

Uses: Leaf juice is dropped into eyes to cure cataract, redness and conjunctivitis. Whole plant paste is tied up the minor cuts and wounds as antiseptic for healing.

Hydrolea zeylanica (L.) Vahl (Hydrophyllaceae) Or: *Balubalia-kasindri* (Fig. 6)

Paste of whole plant with coconut oil is applied in minor cuts, wounds and boils as antiseptic for quick healing.

Hygrophila auriculata (Schumach) Heine
(Acanthaceae) Or: *Koilekha*

Uses: Seed powder mixed with raw cow milk is taken in morning for treating impotency. Leaf juice is given to patients of anemia. Dry seed powder mixed with milk and sugar candy is taken to cure spermatorrhoea.

Ipomoea aquatica Forssk. (Convolvulaceae) Or:
Kalama

Uses: Fried leaves are taken to cure head reeling. Leaf juice along with cow *ghee* is given to cure gonorrhoea; is a purgative and acts as blood purifier.

Limnophila indica (L.) Druce (Scrophulariaceae) Or:
Kerolata

Uses: Juice of aerial parts of plant with ginger and cumin is prescribed to cure dysentery. The same is applied externally on cuts and wounds as antiseptic.

Limnophila rugosa (Roth) Merr. (Scrophulariaceae)
Or: *Bhringaraj* (Fig. 7)

Uses: Leaf paste with leaves of *tulsi* is given orally to cure urinary burning.

Lindernia anagallis (Burm.f.) Pennell
(Scrophulariaceae)

Uses: Whole plant paste along with black pepper is given for gonorrhoea.

Lindernia crustacea (L.) F. Muell. (Scrophulariaceae)

Uses: Leaf paste with lemon juice is given orally to cure excess bile secretion; also applied externally on ringworm and boils.

Ludwigia adscendens (L.) Hara (Onagraceae) Or:
Panitagara

Uses: Whole plant paste is applied against ulcers and skin diseases.

Marsilea quadrifolia L. (Marsileaceae) Or: *Sunusunia*

Uses: Raw leaf paste is applied on forehead to cure headache and for head cooling. Leaves fried in cow *ghee* are taken regularly as curry to cure biliousness. Leaf juice along with root extract of *Asparagus racemosus* and sugar candy powder is taken orally or leaf juice with ginger juice and honey is also taken to increase sperm formation. Warm root paste with black pepper is applied around boils as suppurate.

Monochoria vaginalis (Burm.f.) Presl.
(Pontederiaceae) Or: *Mirmira*

Uses: Leaves with ginger juice and honey is taken to cure cough and cold. Root is chewed to cure toothache.

Murdannia nudiflora Gaertn. (Commelinaceae)

Uses: Root paste with goat milk is prescribed orally to cure asthma. Whole plant paste with common salt is applied on the effected area to cure leprosy.

Nelumbo nucifera Gaertn. (Nymphaeaceae) Or:
Padma

Uses: Paste of young leaf, along with fruits of *Emblica myrobalan* (*Phyllanthus emblica*) is applied on forehead to get relief from headache. Flower petal decoction is given against diarrhoea. Young flower paste is prescribed as cardiac tonic and also in fever and liver ailments. Dried seed powder is taken along with fresh cow milk against headache. Young seed paste is used externally as a cooling medicine for skin diseases. Powdered root is taken for expelling ringworms. Root paste kept in a fine cloth and rolled to a thread (*salita*), and dipped in cow *ghee* is inserted inside the nostril of the unconscious patient suffering from fits and kept till the patient become conscious. Root paste in lemon juice is taken for the treatment of piles.

Neptunia oleracea Lour. (Mimosaceae) Or:
Panilajakoli

Uses: Fresh leaf juice is taken as refrigerant and astringent. Stem juice is poured into ear to get relief from earache.

Nymphaea nouchali Burm. f. (Nymphaeaceae) Or:
Nila Kain

Uses: Rhizome along with refined form of *gur* (*Nabata*) and roots of *Lawsonia inermis* grinded in rice washed water is taken to cure diabetes. Flowers are soaked in water overnight; decanted water is drunk for various cardiac problems. Seed decoction soaked in cloth is applied for the treatment of skin infection. Raw rhizome is the best medicine for dysentery.

Nymphaea pubescens Willd. (Nymphaeaceae) Or:
Dhala Kain, Nali kain

Uses: Decoction of rhizome of red flowered plant is given for blood dysentery. Rhizome juice is prescribed against leucorrhoea. Powdered rhizome with honey is given for piles, dysentery and dyspepsia. Root juice is drunk to keep stomach cool and to get relief from burning sensation during urination. Root paste of the red flowered plant is given for treating menorrhagia. Paste of root of the plant with flowers of *Hibiscus rosa-sinensis*, bark of *Ficus religiosa* and seeds of *Sesamum indicum* (*Rasi*) is taken for abortion.

Nymphoides hydrophylla (Lour.) Kuntze (Menyanthaceae) Or: *Tagarapada*

Uses: Leaf juice drops are applied against eye disease. Leaf paste is used as an antidote for scorpion sting and snakebite. Seed powder with honey is taken orally as an anthelmintic.

Nymphoides indica (L.) Kuntze (Menyanthaceae) Or: *Sitala*

Uses: Leaf paste is applied on forehead to get relief from headache due to bile. Plant decoction is drunk to cure fever and dysentery. Dried plants are dipped in sesame (*Sesamum indicum*) oil for 7 days; the oil is filtered, stored and applied externally to get relief from headache, rheumatism and bile. Leaf paste with turmeric is applied externally to cure scabies; applied on the swelling part of the body to get relief.

Oldenlandia diffusa (Willd.) Roxb. (Rubiaceae) Or: *Gharapodia*

Uses: Plant extract is with honey is prescribed orally to cure bilious fever. To heal cuts, wounds and boils, the area is washed with the plant extract. Plant paste is applied externally to cure acne and boils.

Pistia stratiotes L. (Araceae) Or: *Borjhanji*

Uses: Whole plant is boiled and tied at the rheumatic swollen parts of the body to reduce the swelling. Leaf juice boiled with coconut oil is applied externally to cure skin diseases, leprosy and eczema. Plant decoction is taken to cure irregular urination.

Polygonum barbatum L. (Polygonaceae) Or: *Paniakhu*

Uses: The inter-nodal part is used as beads for the preparation of a chain which is tied around the neck of young children suffering from conjunctivitis.

Polygonum glabrum Willd. (Polygonaceae)

Uses: Paste of leaves with black pepper is taken with honey to cure fever and colic pain.

Rotala rotundifolia (Roxb.) Koehne (Lythraceae) Or: *Panilatkan*

Uses: Juice of the aerial part of the plant is given to cure cough, cold and fever.

Scoparia dulcis L. (Scrophulariaceae) Or: *Banaganjei, Chireita*

Uses: Leaf paste with honey is taken against malaria. Leaves are chewed in empty stomach for treating diabetes and gonorrhoea.

Sphaeranthus indicus L. (Asteraceae) Or: *Bhuinkadamba*

Uses: Paste prepared from inflorescence is given in empty stomach for curing excess bile. Whole plant paste with a pinch of common salt is taken as an anthelmintic. Stem with leaf is chewed to get relief from toothache.

Tonningia axillaris (L.) Kuntze (Commelinaceae) (Fig. 8)

Uses: Warm leaf juice is dropped into the ear to get relief from inflammation in the eardrum.

Typha angustata Bory & Chaub. (Typhaceae) Or: *Hangala*

Uses: Rhizome decoction is used as an astringent.

Wedelia chinensis (Osbeck) Merr. (Asteraceae) Or: *Bhrungaraj*

Uses: Plant juice is used in preparation of *Bramhi* oil and *Bhrungaraj* oil for proper growth of hair. Plant juice is directly used for blackening of hair.

Xyris indica L. (Xyridaceae) (Fig. 9)

Uses: Whole plant paste is applied externally to cure ring worm, itches and leprosy.

Discussion

Local poor people collect wild aquatic plant resources freely from the environment as a means of livelihood and source of income. A large number of wetland medicinal plants are commonly associated with rivers, ponds and other water bodies throughout the study area. Medicinal uses of some wetland species are unique to the traditional medicinal knowledge system of the locality. Probably because of restricted distribution of *Caesulia axillaris* and *Xyris indica* in Kandhamal district, their medicinal uses are also confined to *Kutia Kandha* tribe of a very limited area of the Kandhamal district. *Alternanthera philoxeroides* is found in 4 districts but the medicinal property is reported only from Ganjam and Rayagada districts. The availability and uses of *Coix aquatica* are confined to the *Kandha* tribe of Koraput and Nawrangapur districts. Although *Enydra fluctuans* and *Limnophila rugosa* are distributed in 3 districts, the medicinal value is reported only from Kandhamal district. *Nelumbo nucifera* is rare in Khadhamal district and medicinal value is unknown to the traditional healers of the district. These observations show that a major bulk of folk or ethnomedicine remained endemic to certain regions or communities

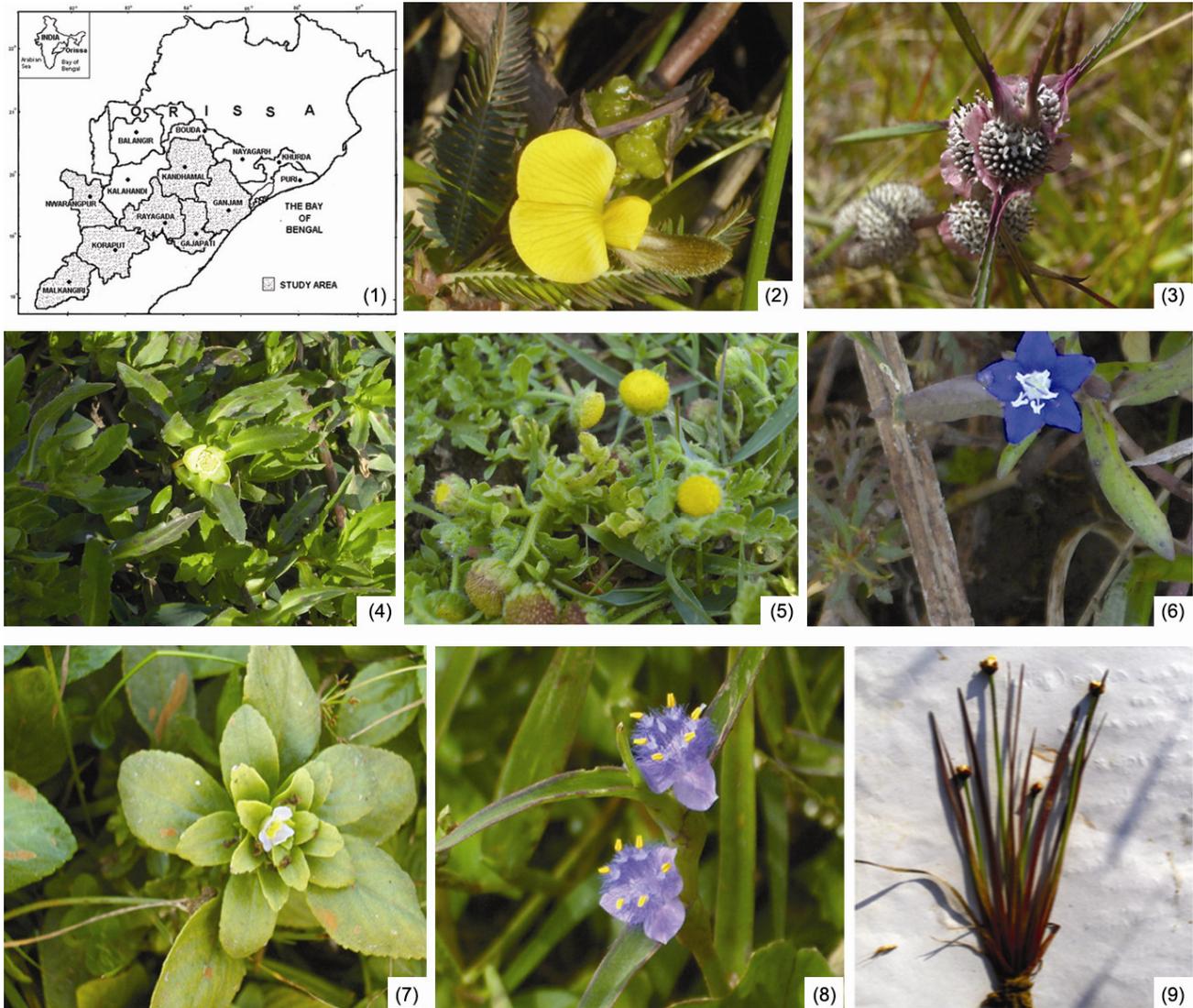


Fig. 1—Map of the study area; Fig. 2—*Aeschynomene aspera*; Fig. 3—*Caesulia axillaries*; Fig. 4—*Enydra fluctuans*; Fig. 5—*Grangea maderaspatana*; Fig. 6—*Hydrolea zeylanica*; Fig. 7—*Linnophila rugosa*; Fig. 8—*Tonningia axillaries*; and Fig. 9—*Xyris indica*

in the country may be due to restricted availability of plant species and lack of communication among the communities¹⁶. Most of the ethnomedicinal information collected in the study is new, as they are not recorded earlier. The information was compared/checked with available literature^{4-9,13,19-23}.

Further, out of 48 plants reported, 19 species are earlier reported for similar use. Moreover, these report differ either in parts of the plant used or in preparation and mode of use²³. In the report, some new additional information on uses of the above 19 plant species is incorporated; 29 plant species are reported with new medicinal uses. Eighteen of them are reported earlier

for some ailment but additional information on uses of these species against new diseases is described in the report²⁴⁻²⁹. Eight species such as *Aeschynomene aspera*, *Coix aquatica*, *Hedyotis diffusa*, *Linnophila rugosa*, *Lindernia crustacean*, *Neptunia oleracea*, *Pistia stratiotes* and *Xyris indica* are not reported as yet for their medicinal value. However, *Alternanthera philoxeroides*, *Nymphoides indica* and *Rotala rotundifolia* are reported to have medicinal values from Manipur³⁰. Out of the various parts used as native medicines, leaf and shoot or whole plant are commonly used. Leaves of 26 plants are found to be used and shoot or whole plants of 19 species are used for the preparation of medicine. Root, buds, flowers,

fruits, seeds and exudates like latex and juices are less commonly used.

Ethno-medico-botany plays a great role in exploiting the medicinal chemicals from the medicinal plants used by tribal/rural people of indigenous communities. About three-fourths of the biologically active plant-derived compounds presently in use globally have been discovered through research on folk and ethno-medicinal uses³¹. Plants are still the main source of medicine to majority of people world wide, about 90% of the raw materials required for preparation of modern medicine come from wild sources^{32,33}. The ethnobotanical information serves as a base for new compounds with active principles for phytochemical, pharmacognostical, pharmacological and clinical research. Global wetlands are shrinking rapidly depleting wetland resources. The survival of native aquatic species is threatened and hence attention on the aquatic resources especially those having economic value are important. Wetlands not only provide useful resources but ecologically very important. Therefore, conservation of wetlands especially in South Orissa, which are threatened, needs to be addressed urgently.

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