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# Weed Diversity of Rabi Crops and their Ethnomedicinal uses in Kendrapara District of Odisha, India

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## Abstract

*An ethnobotanical exploration was carried out during 2010-2012 in four selected C.D. Blocks of Kendrapara district of Odisha namely Rajnagar, Rajkanika, Mahakalpada and Derabish to document the use of weeds found in crop fields during Rabi season. The Rabi crops include green gram, black gram, ground nut, mustard, sun flower, potato and other vegetables such as radish, coriander, cauliflower etc. Farmers, local people, agricultural labourers as well as herbal healers of the said area were approached to collect the information on the uses of the crop weeds in primary health care and as raw materials for the preparation of various herbal formulations. The present investigation revealed the occurrence of 60 weed species belonging to 50 genera and 32 families found associated with the principal crops in these crop fields. Out of these, 38 species are used by the local populace for the treatment of various diseases and disorders of human as well as domestic animals. Some of the widely used weeds include Amannia baccifera for skin infections, Canscora decussata for mental debility, Caesulia axilaris and Centipida minima against worm infestations, Coldenia procumbens to treat wound and injuries of domestic animals, Chrozophora rottleri for jaundice, Seseli diffusum used as diuretic and antispasmodic, Sonchus asper for wound and boils, Sphaeranthus indicus against cough, Spilanthes paniculata against toothache, Trichodesma indica useful in stomach disorder, abdominal pains and skin diseases, Urena lobata in the treatment of rheumatism and Xanthium indicum against skin diseases of cattle. Further studies on the phytochemical screening of these native ethnomedicinal crop weeds may lead to the discovery of new bioactive molecules towards the development of drugs for safer use. On the other hand, the above findings may be of immense help to the labourers or marginal farmers to get additional livelihood for organized collection, processing and marketing of these medicinal crop weeds depending on the demand of the pharmaceutical houses.*

**Keywords:** Ethnomedicine, Kendrapara, Odisha, Rabi crop, weed diversity.

## Introduction

The district Kendrapara lies in 20° 20′ N to 20° 37′ N Latitude and 86° 14′ E to 87° 01′ E Longitude and situated in the east coast of Odisha. Bay of Bengal lies its eastern side and is extended about 48 km from 'Dhamara Muhan' to 'Batighar'. Geographically, the district is placed in the north of Jagatsingpur district, west of Cuttack district, southwest of Jajpur district and south of Bhadrak district of Odisha (figure-1). Topographic features of the district reveal two distinct tracts of land mass such as marshy and swampy strips along the coast with luxuriant growth of weeds and the other one being the deltaic plain; formed by the rivers like the Brahmani, the Baitarani and tributaries of the Mahanadi which is highly fertile and mostly flood prone. The soil is mostly of alluvial type. The district has a population of 13.02 lakh distributed in nine C.D. Blocks namely Aul, Derabish, Garadpur, Mahakalpada, Marsaghai, Kendrapada, Rajnagar, Rajkanika and Patamundai. The Bhitarkanika National Park, found in the eastern part of the district is one of the famous mangrove ecosystems of the Indian subcontinent which is also well known for its crocodile breeding centre thereby attracting ecotourism. Plants were in use by man since prehistoric times and some plants utilized as food, medicine and fibre are now considered as weed, because of the discovery of new improved plant species. Many of these plant species would still be considered useful but are ignored in view of the development of plants having greater productivity and superior flavour. Inspite of their negative impact on crops, most of the weeds have positive uses as mentioned above The one of the important aspect of these weeds seems to be their medicinal properties which is well explored by the native people such as farmers, agricultural labourers and knowledgeable elderly persons for curing a wide range of diseases in human as well as domestic animals. Rural people are very much familiar with large number of wild plants and animals as they live close to nature. Earlier reports indicate the use of several medicinally important plant species by the rural community of Odisha to cure various human and animal diseases[1-11]. However, very little work has been attempted on ethnobotany of crop weeds, for which the present study was undertaken[12]. The objective of the study is to explore, collect, identify and document the ethnomedicinal weed diversity and their utility before the traditional knowledge-base are wiped out or lost with rapid expansion of modern technology. The present study emphasizes upon the popularization of traditional knowledge of rural

communities for ensuring local values to be translated into rational use of the folklores as source of medicine as well as effective conservation of their biodiversity. This has simultaneous impact on the socioeconomic upliftment of the local communities.

## Methodology

An extensive investigation was conducted to find out the medicinal value of weeds prevalent in the field of Rabi crop in Kendrapara district of Odisha during 2010-2012. Field trips were organised in selected four locations of the district namely Rajnagar, Rajkanika, Mahakalpada and Derabish. The Crop fields surveyed include Green gram, Black gram, Ground nut, Mustard, Sun flower, Potato, and other vegetables like Radish, Coriander, Cauliflower etc. Some common people, farmers, as well as local herbal healers were interviewed to know the name of the weeds and their use in the treatment of human and animal diseases. Ethnic uses of these plants were studied *in situ* by establishing close intimacy with the herbal healers as well as knowledgeable men and women of the area. Various claims in folk-lore were recorded and voucher specimens were collected.

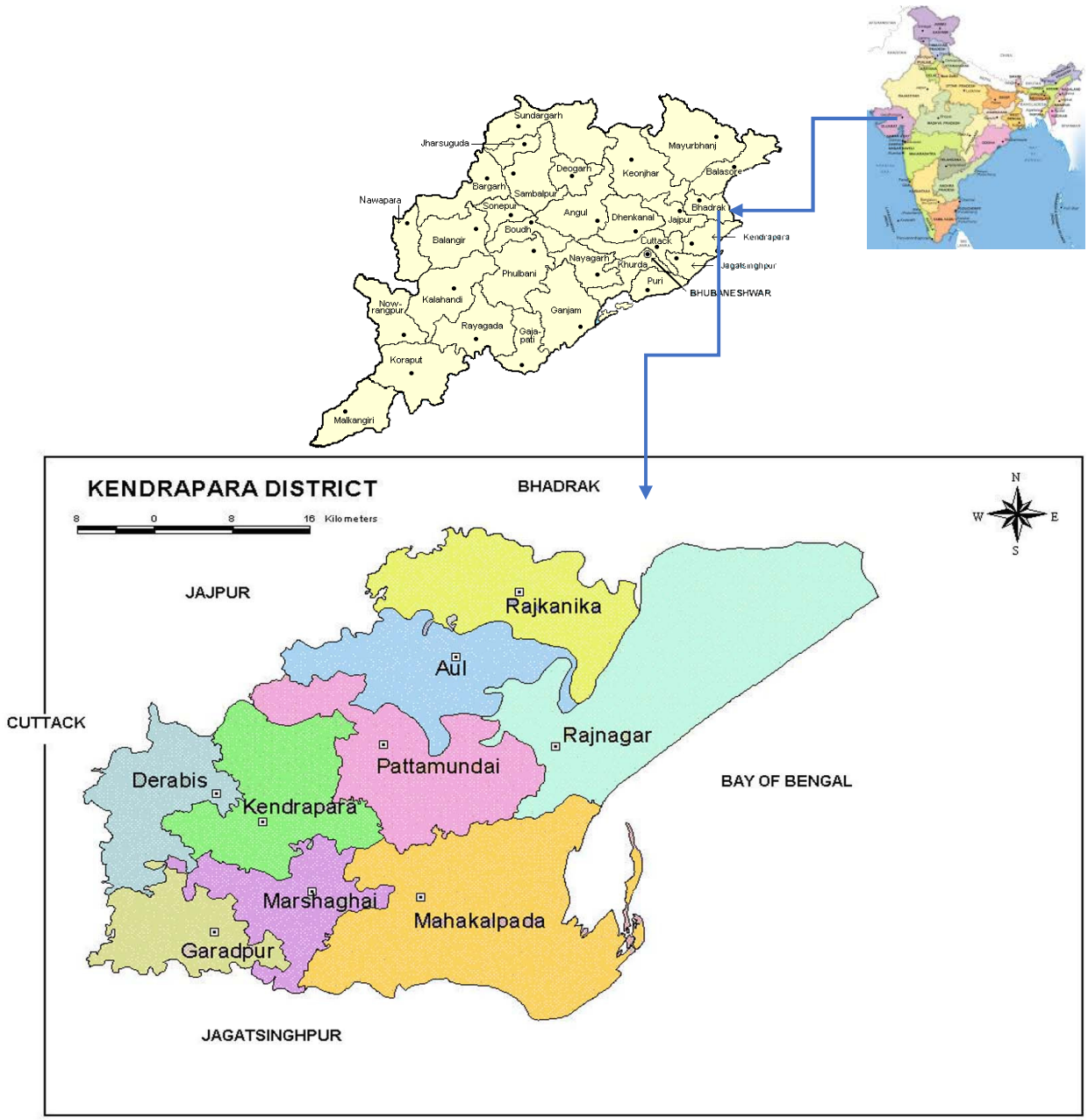


**Figure-1**
**Map of Kendrapara district of Odisha**

As the flowering and fruiting seasons are different, floristic survey of crop fields were conducted at regular intervals to gather information of different stages of development of the weed specimens. The detailed ethnic information regarding the application, procedures and preparation methods of these crop weeds were documented. The collected weed specimens were extensively studied and identified following available literature 'Flora of Orissa' and preserved in the Herbarium of Post Graduate Department of Botany, Utkal University, Bhubaneswar for future reference[13].

## Result and Discussion

During the survey of the Rabi crop fields, located in the four Blocks of the district, 60 weed species belonging to 50 genera and 32 families were collected and documented. However, the information collected on the utilization of these weeds revealed that 38 species belonging to 20 families were having utility in combating various ailments of human beings as well as domestic animals (table-1). These medicinal weeds were found to be frequently used for the treatment of common human diseases including cold and cough, diabetes, diarrhoea, dysentery, ear infection, fever, glycosuria, gastric troubles, jaundice, joint pain, skin infections, food poisoning, epilepsy, psychosis, nervous depression, leucoderna, pyorrhoea, back ache, trauma, gum troubles, scalp sore of children, gynaeocological problems, respiratory disorders, while the veterinary uses covered breathing trouble, cold and cough, dyspepsia, enlargement of glands in throat, flatulence, foot and mouth disease and indigestion. It is also evident from the Table 1 that the family Asteraceae (eight species) shows a rich diversity of ethnomedicinally important crop weeds followed by the family Euphorbiaceae (five species) as compared to other angiospermic families studied. Reports are available on different useful weeds from different parts of the state of Odisha[12,14], however, the present investigation will certainly highlight the role of different crop weeds of Rabi season in Kendrapara district. A good number of workers also investigated the ethnobotanical uses of common plants of Odisha used in various diseases of human beings[1-11] and animals[5,15].

**Table 1**
**Crop weeds used against various diseases of human being and animals**

| Botanical Name | Local name and Distribution | Ethnic uses |
|---|---|---|
| ***Acanthospermum hispidum*** DC. (ASTERACEAE) | Gokhura(O); A common weed | Whole plant is crushed to make a paste to use in skin ailments and juice of the leaf is used to treat general fever. |
| ***Ammania baccifera*** L. (LYTHRACEAE) | Ramdauni (O) Common in fields of black gram | Whole Plant is used as paste on skin against burning sensations. |
| ***Bidens pilosa*** L. (ASTERACEAE) | Bila gendu(O); Frequent in green gram crop fields | The flowers are used for the treatment of diarrhoea, amoebic dysentery and stomach disorder due to food poisoning. |
| ***Blainvillea acmella*** (L.) Philipson (ASTERACEAE) | Tankoda (O); Common crop weed | One cup of fresh leaf juice is given during morning for 10 days to reduce the alcoholic addictions. |
| ***Canscora decussata*** (Roxb.) Schult. and Schult. (GENTIANACEAE) | Shankapuspi (O); Occasional in Crop fields. | Decoction of the whole plant (20 ml) is given with old jaggery (5 g) to treat epilepsy and psychosomatic disorders. |
| ***Catharanthus pusillus*** (Murr.) G.Don. (APOCYANACEAE) | Kuji Sadabahar(K) Frequent in cultivated crop fields | |
| ***Chloris barbata*** Sw. (POACEAE) | Barabula ghasa(O); Fairly common weed in fallow crop fields | Whole plant is prescribed to cure diabetes. |
| ***Chenopodium album*** L. (CHENOPODIACEAE) | Bathua Saga (O); Found in potato beds or ground nut fields | Affected parts are applied with juice prepared from leaves for 15 days or till the disappearance of white spot or leucoderma. |
| ***Chrozophora rottleri*** (Geisel.) Juss. (EUPHORBIACEAE) | Nilakanthi (O) A common weed in all field crops | Ashes of its root are given to children to cure cold and cough. |
| ***Cleome rutidosperma*** DC. Prod. (CAPPARACEAE) | Bana sorisa (M); Occasionally in crop fields | Leaves are squeezed and the juice is put as eye drop to cure ophthalmologic disorders. |
| ***Coldenia procumbens*** L. | Gondhrilata (O); | Leaf paste is applied to the affected part to cure |

| Botanical Name | Local name and Distribution | Ethnic uses |
|---|---|---|
| (BORAGINACEAE) | Very common weed during harvesting | foot and mouth diseases of domestic animals. |
| ***Corchorus aestuans*** L. (TILIACEAE) | Bananalita(O); Mostly found along the bunds. | Plant extract is used in skin diseases. |
| ***Desmodium heterocarpon*** (L.) DC. (FABACEAE) | Dongerabuta (O); A common weed associated with black gram and green gram crops | Whole plant is used as paste to cure backache. |
| ***Emilia sonchifolia*** (L.) DC. (ASTERACEAE) | Sarkara(O); Common weed along the field borders. | The decoction of the root is used to cure diarrhoea. |
| ***Euphorbia heterophylla*** L. (EUPHORBIACEAE) | Chitra patra(O); Occasional in crop fields | Roots are made into paste and used in treatment of traumatic injury. |
| ***Galinsoga parviflora*** Cav. Icon. (ASTERACEAE) | Hatihatia(O); Commonly seen in cultivated lands | The decoction of the whole plant is used to treat wounds. |
| ***Gomphrena celosoides*** Mart. (AMARANTHACEAE) | Godi phula(O); Common weed during crop fields. | Root (1 cm) is chewed before sleep at night regularly against pyorrhoea and gum troubles. |
| ***Grangea maderaspatana*** (L.) Poir. (ASTERACEAE) | Agnikumari(O); A common weed during intercultural operation. | A small part of root (1 cm) is chewed after meal at night for a period of 15 days against dyspepsia. |
| ***Hedyotis corymbosa*** (L.) Lam. (RUBIACEAE) | Gharapoadia(O); Fairly a common weed | The decoction of the whole plant is given two times daily for 4 days against fever caused due to gastric disorder and nervous debility. |
| ***Hybanthus enneaspermus*** (L.) F.v. Muell. (VIOLACEAE) | Madana Mastak (O); Fairly a common weed fallow crop fields | The root (10 g) made into a paste with 3 black peppers and is taken on empty stomach once daily for 21 days against diabetes. |
| ***Lippia javanica*** (Burm.f.)Spreng. (VERBENACEAE) | Nahuari(O); Frequently in marshy habitat but occasional in crop fields. | Decoction of leaves taken as a remedy against respiratory disorders. |
| ***Malachra capitata*** (L.) L. (MALVACEAE) | Occasional in crop fields | The seeds are used as a remedy against dental problem in cattle. |
| ***Melochia corchorifolia*** L. (STERCULIACEAE) | Telpuri (O): Fairly common weeds in irrigated crop fields | Whole plant decoction is administered thrice a day against diarrhoea and dysentery. |
| ***Nicotiana plumbaginifolia*** Viv. (SOLANACEAE ) | Hemraj (O): Frequently associated with vegetable crop fields. | Leaves are used against snake bite as well as on different wounds of skin. |
| ***Phyla nodiflora*** (L.) Greene (VERBENACEAE) | Godingi (O); Very common in crop fields. | Plant decoction is taken twice a day against diarrhoea. |
| ***Phylanthus amarus*** Schum. and Thonn. (EUPHORBIACEAE) | Badi aenla(O); A common weed in irrigated crop fields | Entire plant decoction is used against jaundice. |
| ***Phyllanthus fraternus*** Webstr. (EUPHORBIACEAE) | Badi aenla(O); A common weed in irrigated crop fields | The infusion (15 ml) of young shoots is given three times a day for 2 days to cure bacillary dysentery. |
| ***Phyllanthus virgatus*** Forst.f. (EUPHORBIACEAE) | Bhui aonla(O); Fairly common in green gram and black gram fields. | Whole plant decoction is used especially in gynecological problems. |
| ***Physalis minima*** L. (SOLANACEAE) | Tipai(O); Mostly found in vegetable crop fields. | The paste of fruits or roots is given once in a day for 7 days against jaundice. |

| Botanical Name | Local name and Distribution | Ethnic uses |
|---|---|---|
| ***Pouzolzia zeylanica*** (L.) Benn. (URTICACEAE) | Turania mula (O) Frequently in moist and shady places. | The paste made from leaf is applied on the affected part to cure scalp-sore of children. |
| ***Scoparia dulcis*** L. (SCORPHULARIACEAE) | Khetapapada(O); Common weed in wastelands as well as crop fields. | The leaf juice (10 ml) mixed with honey (5 drops) is given two times a day for 5 days against fevers. |
| ***Seseli diffusum*** (Roxb.ex Sm.) Sant. and Wagh (APIACEAE) | Bhuin porisha/ Bila juani (O); Frequently appearing in crop fields | Root decoction is used as anti-diuretic as well as anti-spasmodic. |
| ***Sonchus asper*** (L.) Hill (ASTERACEAE) | Pita gachha(O); Found mostly in ground nut fields. | Whole plant is ground and powder is applied on skin affected by burning sensations. |
| ***Sphaeranthus indicus*** L. (ASTERACEAE) | Bhuin kadamba(O); Found mostly in ground nut or green gram field | Paste made from the plant is given with little old jiggery two times a day for 3 days against excessive urination caused due to diabetes. |
| ***Spilanthes paniculata*** Wall. ex. DC. (ASTERACEAE) | Biri biri (O); Frequent in black gram and green gram fields. | Inflorescence is made into paste and used in treatment of dental disorders related to microbial infection. |
| ***Trianthema portulacastrum*** L. (AIZOACEAE) | Khapara saga(O); Common weed of pulse crops. | Cooked leaves are prescribed to cure mouth ulcers and for getting relief from rheumatic pain. |
| ***Trichodesma indicum*** (L.) R.Br. (BORAGINACEAE) | Henturi (O); Frequent in pulse crop fields | Leaves are ground and applied to the affected joints of the body to reduce the pain and swellings caused due to rheumatoid-arthiritis. |
| ***Urena lobata*** L. (MALVACEAE) | Rakta pheni (O); Occur along the borders of crop fields. | Root decoction is used against gastro-intestinal problems. |

## Conclusion

It is evident that the age old herbal cure practice in the rural areas is loosing its popularity due to easy accessibility to modern medicines and ignorance about the potential medicinal weeds available in the vicinity of their surroundings. Moreover, a sector of rural population, agricultural laborers and marginal farmers still depend upon these weeds for their primary healthcare practices. In order to remain away from relying upon antibiotics as well as synthetic medicines which have many negative side effects, the ethnomedicinal plants documented for their potential against various ailments are required to be analyzed scientifically for the discovery of new bioactive principles towards the development of drugs for safer use. The present findings may be of immense help to the labourers or marginal farmers to get additional livelihood for organized collection, processing and marketing of these medicinal crop weeds depending on the demand of the pharmaceutical houses.

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