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Sarita Sasmal
Department of Botany, Fakir Mohan University, Balasore, Odisha, India

Mihir Tanay Das
1) Department of Environmental Science, Fakir Mohan, University, Balasore, Odisha, India
2) Centre of Excellence for Bio-resource Management and Energy Conservation Material Development, Fakir Mohan University, Balasore, Odisha, India

Rajashree Das
1) Department of Botany, Fakir Mohan University, Balasore, Odisha, India
2) Department of Environmental Science, Fakir Mohan, University, Balasore, Odisha, India

Corresponding Author:
Rajashree Das
1) Department of Botany, Fakir Mohan University, Balasore, Odisha, India
2) Department of Environmental Science, Fakir Mohan, University, Balasore, Odisha, India

A survey on ethnomedicinal uses of indigenous leafy vegetables in Remuna Block of Balasore, Odisha, India

Sarita Sasmal, Mihir Tanay Das and Rajashree Das

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Abstract
Given the current state of deforestation and the steadily declining availability of economically and medicinally significant flora, traditional knowledge is essential for maintaining a balance towards biodiversity and sustainability. It must be targeted and passed down generation by generation. The use of traditional medicine is widespread in rural areas. It is predicated on information, expertise, and knowledge about the plants that will be utilized for various objectives. The study of ethnobotany has sparked a fresh interest in traditional medicine, especially in herbal remedies. This research focuses on the ethnomedicinal characteristics of some non-cultivated, native green leafy vegetables from different parts of Balasore district Odisha. Based on ethnobotanical data gathered from field surveys and literature reviews, it is noted that rural populations use them as diuretics, laxatives, cooling agents, digestive aids, antioxidants, and tonics. It is due to source of proteins, carbohydrates, iron, some other essential minerals etc. and used in regular diet. As a result, they serve as an oblique substitute for readily available medical supplies in their natural habitat. Thus, these plants may be presented as herbal medicine in the future by examining their bioactive ingredients.

Keywords: Leafy vegetables, ethnomedicinal, herbal medicines, bioactive ingredients

1. Introduction
Gingers India is blessed with a vast resource of greeneries and wide array of indigenous and under exploited vegetables particularly leafy vegetables which are widely used as sources of food and sources of income for many poor communities in India. Man has tremendous influence on wild edible plants since before civilization [1]. These plants contain considerably high nutritional value and thus can be used at the time of various environmental conditions such as drought. India is a country with large ethnic society and has immense wealth due to which it is rich in biodiversity [2]. Leaf vegetables, also called potherbs, greens, or leafy greens, are plant leaves eaten as a vegetable, sometimes accompanied by tender petioles and shoots. Leafy vegetables hold an important place in well-balanced diets. They are often considered as 'poor man's vegetables' as it is cheaper and easily accessible. Although they are inexpensive and easily available still it remains underutilized now a days due to lack of awareness about its nutritive and medicinal values [3]. Moreover, due to urbanization, traditional knowledge relating to their ethnomedicinal uses is vanishing day by day. ILVs have immense potential to meet the demands of hunger of growing population of whole country besides their wide applications in agriculture and industry [4]. Green leafy vegetables are important group of nutrient dense commodity regarded as natures' anti-aging wonders[5].They are inexpensive food resource and a future herbal medicine owing to its concentrated and overloaded source of nutrients and phytochemicals[6].Leafy vegetables are unique among all vegetable crops because they are rich in nutrients, extremely healthy and endowed with a variety of phytochemical, antioxidant, vitamins and minerals, such as lutein, zeaxanthin and beta – carotene, which both prevent cell damage and aid in the treatment of age related issues. Together with vitamins A, C, K, Ca, Fe and P, K, Na and Zn, tocopherols and polyphenols are crucial for overall health and offer protection against cancer and coronary heart disease [7-11]. Leafy vegetables are storehouse of nutrients which can overcome the problem of malnutrition and can boost our immune system. They are the most readily available sources of carbohydrates, fats, proteins, vitamins, minerals, essential amino acids, and fibers [12]. These are known to contain antioxidants necessary in neutralizing free radicals which are known human chemical hazards [13].

It is rather unfortunate that there is now a gradual neglect of some of the useful traditional leafy vegetables that have been used for food and medicine over the years by local and tribal. Unfortunately, some of them are still confined to local habitat and not explore commercially, accompanied by rare consumption [14-16]. Knowledge of wild leafy vegetables may be lost in the near future, unless efforts are made to educate younger generations about their importance. These traditional greens having rich in bioactive compounds can play a role of future medicine [17]. Exploitation and wider use of these underutilized crops can become a solution to the social problems like food health and nutritional security, poverty and unemployment [18]. With vanishing ethnomedicinal knowledge day by day, the need of the hour is to explore the hidden potential of indigenous leafy vegetables for future generation by immediate documentation and conservation. Research in greater scale of indigenous leafy vegetables can give surprising varieties which can be used as future medicines as well as super food [19].

There have been numerous ethnobotanical researches on edible wild plants in the state of Odisha, but not much work has been done to record the variety and traditional medicinal applications of leafy vegetables in this area. Despite the vast variety of leafy vegetables found in Odisha's Balasore district. Consequently, the current study's objectives are to identify, record, and establish a scientific database on the leafy vegetables found in the Remuna block of the Balasore region, as well as to identify the most often used leafy vegetables with therapeutic properties that are effective against a variety of ailments.

2. Methodology

2.1. Study area

Balasore is an administrative district in the northernmost coastal region of Odisha state, Eastern India (latitude 21°3'–21°59' N, longitude 86°20'–87°29' E). Covering an area of 3806 km2, it is heavily populated (92,320,529 inhabitants as of the 2011 census). With 12 C.D. blocks—Jaleswar, Bhogiri, Basta, Baliapal, Balasore, Remuna, Nilagiri, Bahanaga, Oupada, Soro, Khaira, and Simulia [Figure 1]. Balasore and Nilagiri are the two administrative subdivisions. It is well-known for the distinctive tone of the "Baleswari bhasa," the regional dialect. In addition, a variety of linguistic, religious, and ethnic groups, as well as native tribes like the Santal, Bhumij, and Oraon, live in this district. It is endowed with a wonderful climate, alluvial soil, and perennial rivers that contribute to the region's rich floral diversity.

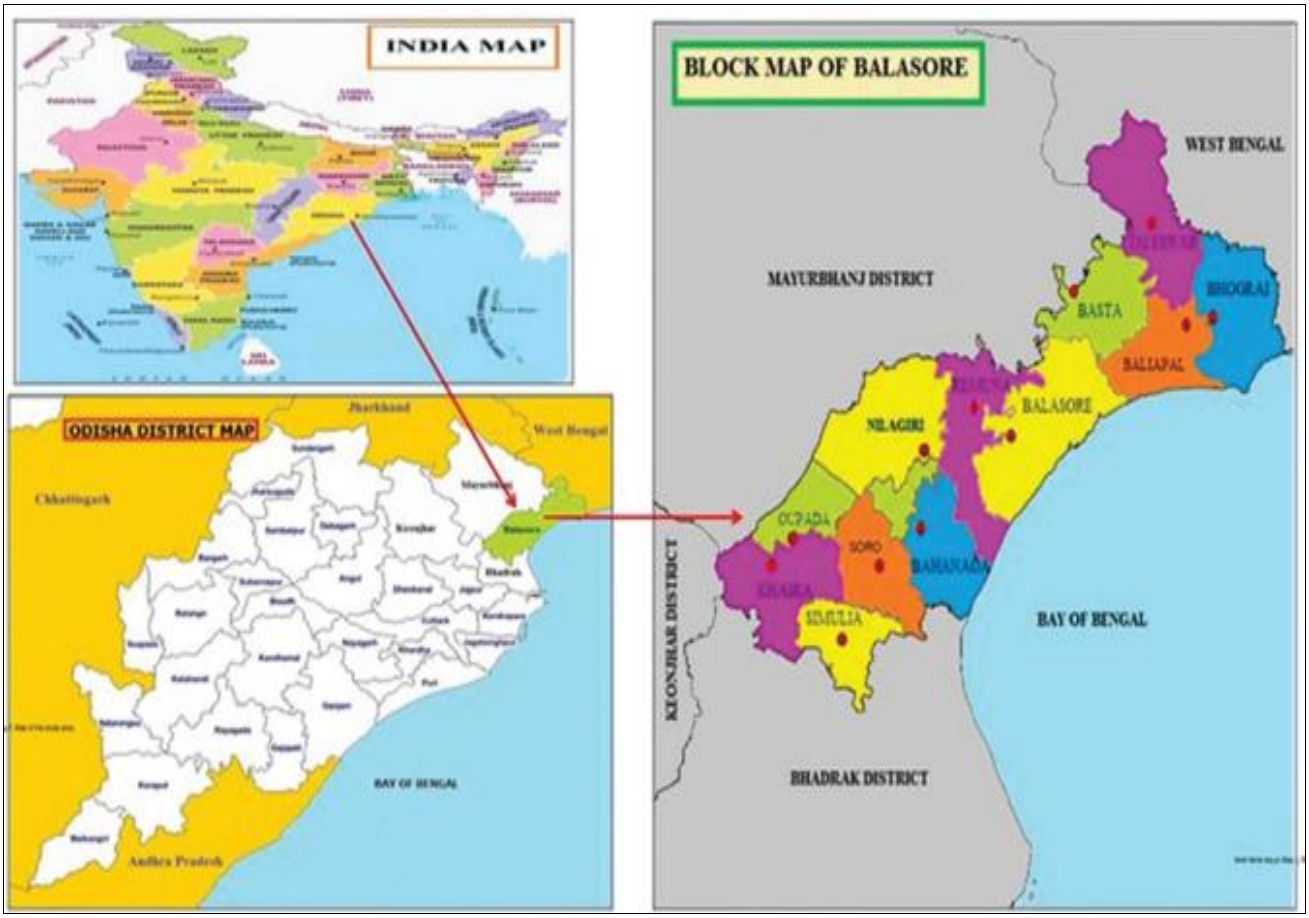


Fig 1: Map of the study area

2.2. Data Collection

In the Balasore district of Odisha, deep seasonal field trips were carried out in the core areas of Remuna block. Information regarding the variety of native green leafy vegetables consumed by the native and tribal inhabitants of the block, as well as their ethnomedical uses against various diseases, was acquired through semi-structured interviews and discussions. A total of 125 local informants were questioned for the survey, comprising 44% women and 56% men. The age range of the informants was 28 to 80 years old. The information on each plant includes its family, habit, botanical name, common name, flowering and fruiting season, and more. The information regarding native leafy vegetables used in ethnomedicine includes the botanical name, colloquial

name, parts utilized, diseases treated, and method of usage.

2.3 Plant identification and Herbarium preparation

Plant specimens collected during field trips were meticulously examined taxonomically and identified by consulting the local flora. Digital photos of plants taken in their native environments were used to help with naming and identification [20-22]. The plant specimens were dehydrated and sent as herbarium samples to the Department of Botany Fakir Mohan University Balasore, Odisha, India.

3. Results and Discussion

3.1. Ethnomedicinal uses

Indigenous green leafy vegetables are vital for growth and good health as they contain all important nutrients. In India a wide range of greens are consumed. Leafy vegetables are particularly rich in mineral nutrients and iron. Inclusion of greens in daily diet would help prevent anemia and promote good health. Moreover, the ongoing pandemic will play a significant impact in popularization of these lesser known indigenous green leafy vegetables, thus preserving the knowledge and tradition of these species. Cultivation of green leafy vegetables should be encouraged so that they will be available all throughout the year. Although they can be raised at lower management cost even on poor marginal soil, they have remained underutilized due to lack of awareness and popularization of technologies for utilization. It is rather unfortunate that there is now a gradual neglect of some of these useful traditional leafy vegetables that have been used for food and medicine over the years. Many unexplored green leafy vegetables species are present which needs immediate documentation research and conservation for welfare of the humankind. Research in greater scale of these green leafy vegetables can give surprising varieties and surprising results which can be used to meet the fast growing demand of the population in the whole country.

Many scholars support the findings of the current study on *O. corniculata* L. in the treatment of diarrhea. To treat diarrhea, 10 milliliters of this plant's leaf juice combined with a small amount of sugar candy powder are given orally twice a day for two days [23-25]. The tribal people of the Remuna Block in the Balasore district employ *A. aspera* L. to treat peptic ulcers. Take 1-2 tablespoons of its leaf juice orally three times a day on an empty stomach for seven days to cure peptic ulcers [26-28].

A total of 30 indigenous green leafy vegetables are collected from the study areas. Out of 30 indigenous leafy vegetables Amaranthaceae is the dominant family with six species followed by fabaceae and Asteraceae with 3 species each followed by Acanthaceae, Phyllanthaceae, Scrophulariaceae, Cucurbitaceae, Oleaceae, Oxialidaceae, Molluginaceae, Apiaceae, Nyctaginaceae, portulaceae, Aizoaceae, commelinaceae, Malvaceae, Apocynaceae with a single species each. Habit wise distribution of the leafy vegetables shows herbs, climbers, shrub, tree and pteridophytes [Table 1].

Table 1: List of indigenous leafy vegetables found in the study areas

Sl no.	Botanical name and Habit	Family	Local name	Parts used	Ethnomedicinal uses
1.	*Aerva lanata* (L.) Juss.ex schult. (Herb)	Amaranthaceae	Lupung saga	Leaves	To treat dysentery, boiled rice and leaf paste are combined, ground, and baked into a cake.
2.	*Amaranthus spinosus* L. (Herb)	Amaranthaceae	Kanta marisha	Root, flower, seed	To treat poisoning, internal bleeding, diarrhea, excessive menstruation, fever urinary problems, dysentery one can take root juice on a daily basis.
3.	*Antidesma acidum* Retz. (Shrub)	Phyllanthaceae	Matha saga	Leaves	For the treatment of dysentery, dried leaf powder is administered with water.

4.	*Bacopa monnieri* (L.) Pennell. (Herb)	Scrophulariaceae	Brahmi	Leaves	Tribal, leaves are used in curry to improve mood and stress resistance after a long day work and a salt-based soups to lessen inflammation and kidney problems.
5.	*Bauhinia purpurea* L. (Tree)	Fabaceae	Rajabiji	Leaves, root, flowers	Asthma and digestive issues can be managed by taking a half-cup of leaf and root juice in a regular basis.
6.	*Senna occidentalis* (L.) Link. (Shrub)	Fabaceae	chakunda	Leaves, root, flowers.	Tribals utilize curry leaves to increase immunity and reduce stress, and they prepare tea for gout, diabetes and hemorrhoids.
7.	*Centella asiatica* (L.) (Herb)	Apiaceae	Thalkudi	Leaves	To stop male white discharge, take a leaf paste mixed with a small amount of black salt twice a day.
8.	*Chenopodium album* L. (Herb)	Amaranthaceae	Bathua saga	Leaves, young shoot, flower bud	A decoction made by crushing the leaves and shoots is used to alleviate constipation, and flower buds can be infused overnight to relieve pain.
9.	*Coccinia grandis* (L.) (Climber)	Cucurbitaceae	Pita kunduri	Leaves and fruits	Leafy chutney is good for diabetes, and a curry with a touch of spice is good for inflammation and ulcerative stomachs.
10.	*Colocasia esculenta* (L.) Schott (Herb)	Araceae	Saru saga	Leaves and corm	Laxative qualities of young leaves aid in the relief of constipation. Soup made from corn and leaves is taken orally to treat neurological disorders.
11.	*Hygrophila auriculata* Schumach. (Herb)	Acanthaceae	kuilirukha	Leaves and young stem	Boil leaves and shoots in water to purify blood, and mix them with vegetables for a curry that is effective against hypoglycemia.
12.	*Mollugo pentaphylla* L. (Herb)	Molluginaceae	pitagama	Leaves	Eating fried leaves has a slight laxative effect. Veggie and leafy soups are meant to stimulate the appetite.
13.	*Marsilea quadrifolia* L. (Pteridophytes)	Marsileaceae	Sunsunia saga	Leaves	Fried leaves have anti-inflammatory, refrigerant, and sleep aid properties when eaten on an empty stomach.
14.	*Oxalis corniculata* L. (Herb)	oxialidaceae	Amrul saga	Leaves	Chuteny, salad, curry, and leaf paste are used to relieve stress, eliminate toxins, stay young and have anthelmintic properties.
15.	*Tridax procumbens* L. (Herb)	Asteraceae	Bisalyakarani	Leaves	Leaf juice treats liver problems, gastritis, heartbun, boils, wounds and has anti-fungal, insect repellent and wound healing qualities.
16.	*Commelina erecta* L. (Herb)	Commelinaceae	Pani kansiri	Leaves	Constipation can be treated with the flower and leaf decoction. The juice from the leaves is used to treat eye sites.
17.	*Nyctaanthes arbortristis* L. (Shrub)	Oleaceae	Singharhaar	Leaves	Leaf juice has been used for cuts, boils, blisters, gastritis, liver problems and insect repellents well as its antifungal and wound healing qualities.
18.	*Erythrina variegate* L. (Tree)	Fabaceae	Paladhua saga	Young leaves	Half cup of leaf juice is taken regularly to cure menstrual disorders.
19.	*Achyranthes aspera* L. (Herb)	Amaranthaceae	Budhi dhaturam	Leaves	For seven days, on an empty stomach, 1-2 teaspoons of leaf juice are taken orally three times a day in order to cure peptic ulcers.
20.	*Boerhaavia diffusa* L. (Herb)	Nyctaginaceae	puruni saga	Leaves	In the morning, the juice of the roots and leaves is consumed before meals to help prevent gastroenteritis. Raita of leaves can act as laxative.
21.	*Enydra fluctuans* Lour. (Herb)	Asteraceae	Hidimicha saga	Leaves	Used as a laxative, leaves are eaten in salads to treat inflammation, prevent abnormalities of the central nervous system and treat skin conditions.
22.	*Portulaca oleraceae* L. (Herb)	Portulaceae	Luna saga	Leaves	It is eaten to avoid nutritional deficiency.
23.	*Trianthum portulacastrum* L. (Herb)	Aizoaceae	Khapra saga	Leaves	Tribal eat leaves and blossoms on a regular basis to treat cancer, avoid liver problems and treat night blindness.
24.	*Alternanthera sessilis* (L.) R.Br.ex Dc. (Herb)	Amaranthaceae	Madranga saga	Leaves and stems	The leaves and flower juice are used by the locals as chutney, hair oil and tonic for indigestion, stress alleviation, hair loss and tonic purposes.
25.	*Eclipta prostrate* (L.) (Herb)	Asteraceae	Kala kesadura	Leaves	To treat dysentery, consume 10 ml of leaf juice mixed with 20 ml of sheep's milk twice a day.
26.	*Commelina benghalensis* L. (Herb)	Commelinaceae	Kansira	Leaves	Juice and paste made from the leaves are used as a laxative and to cure burns, skin inflammation, heartburns and indigestion.
27.	*Abelmoschus moschatus* Medik. (Herb)	Malvaceae	Bana bhendi	Young leaves	Urinary tract infections are treated by consuming the juice of leaves and seeds.
28.	*Cayratia auriculata* (Roxb.) Gamble (Climber)	Vitaceae	Nadaradunka	Leaves	Powdered dried leaves that are eaten to treat dysentery.
29.	*Telosma pallida* (Roxb.) W.G. Craib (Climber)	Apocynaceae	Tokei kundei	Leaves	Leaf juice is frequently consumed to treat asthma, colds, and whooping cough.
30.	*Lecus aspera* (Wild) Spreng. (Herb)	Lamiaceae	Gainsi	Leaves	The paste of the leaves is used for snakebite and juice of the leaves is taken (1 tablespoon) daily to cure fever.


Oxalis corniculata


Bacopa monnieri


Senna occidentalis


Hygrophila auriculata


Chenopodium album


Eclipta prostrata


Amaranthus spinosus

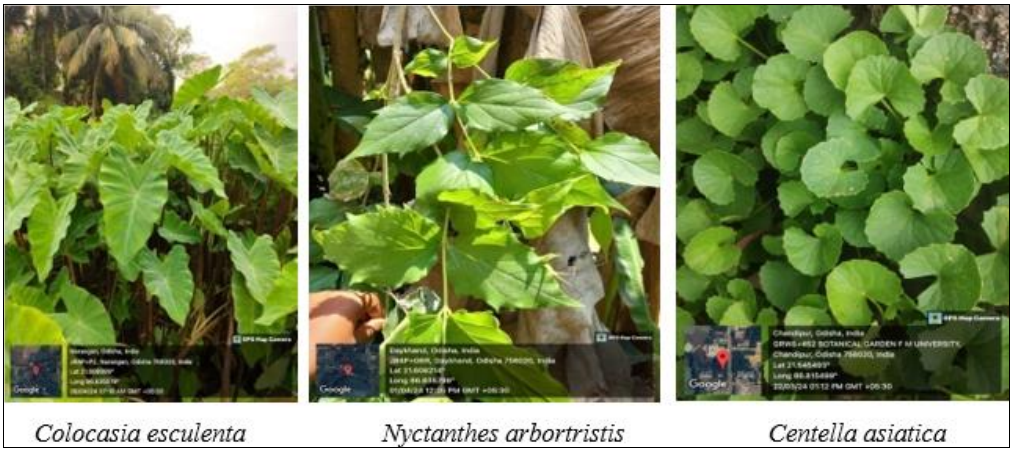

Erythrina variegata


Commelina benghalensis


Tridax procumbens


Coccinia grandis


Portulaca oleraceae



4. Conclusion

The present investigation indicates that wide range of indigenous leafy vegetables contributes significantly to the dietary requirements of rural household in Balasore district of Odisha, India. The study shows that the traditional knowledge and usage of indigenous leafy vegetable is still a major part of village life and culture. These multivalued resources are threatened by several anthropogenic and natural causes such as land use, habitat destruction, migration and scientific harvesting, overgrazing and invasion of alien species. Domestication of the reported species will not only improve the economic condition of the people but will also help in the conservation of biodiversity and conservation of the ethnomedicinal and traditional knowledge of the species and enhance food security. Moreover, the ongoing pandemic has taught us the importance of the eating nutritious food which can enhance the immunity and so has increased the demand for nutritious food like salad greens and other green leafy vegetables. Further research on a greater scale is required to reveal their potential as the future medicines. Therefore, wider survey, interactions with the in habitants and collection of data are essential for proper preservation of this popular traditional knowledge and to enhance the relationship between human society and nature.

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6. References

1. Kamble VS, Jadhav VD. Traditional leafy vegetables: a future herbal medicine. Int J Agric Food Sci. 2013;3(2):56-58.
2. Sahu P, Biswal M, Mishra N. Use of underutilized green leafy vegetables as food nutrition and ethnobotanical among rural community of Odisha: A review. Inter J Chem Stud. 2020;8(5):851-859.
3. Misra S, Maikhuri RK, Kala CP, Rao KS, Saxena KG. Wild leafy vegetables: A study of their subsistence dietetic support to the inhabitants of Nanda Devi Biosphere Reserve, India. J Ethnobiol Ethnomed. 2008 Dec;4:1-9.
4. Sheela K, Nath KG, Vijayalakshmi D, Yankanchi GM, Patil RB. Proximate composition of underutilized green leafy vegetables in Southern Karnataka. J Hum Ecol. 2004 Mar 1;15(3):227-229.
5. Gupta S, Lakshmi AJ, Manjunath MN, Prakash J. Analysis of nutrient and antinutrient content of underutilized green leafy vegetables. LWT-Food Sci Technol. 2005 Jun 1;38(4):339-345.
6. Sudha K, Mathanghi SK. Traditional underutilized green leafy vegetables and its curative properties.
7. Negi PS, Roy SK. Effect of blanching and drying methods on β-carotene, ascorbic acid and chlorophyll retention of leafy vegetables. LWT-Food Sci Technol. 2000 Jun 1;33(4):295-298.
8. Fasuyi AO. Nutritional potentials of some tropical vegetable leaf meals: chemical characterization and functional properties. Afr J Biotechnol. 2006;5(1):49-53.
9. Aberoumand A, Deokule SS. Studies on nutritional values of some wild edible plants from Iran and India. Pak J Nutr. 2009 Oct 14;8(1):26-31.
10. Lakshmi B, Vimala V. Nutritive value of dehydrated green leafy vegetable powders. J Food Sci Technol (Mysore). 2000;37(5):465-471.
11. Misra S, Misra MK. Nutritional evaluation of some leafy vegetable used by the tribal and rural people of south Odisha, India. J Nat Prod Plant Resour. 2014;4(1):23-28.
12. Sharma HP, Rawal AK. Health security in ethnic communities through nutraceutical leafy vegetables. J

Environ Res Dev. 2013;7(4):1423-1429.
13. Mosha TC, Gaga HE. Nutritive value and effect of blanching on the trypsin and chymotrypsin inhibitor activities of selected leafy vegetables. Plant Foods Hum Nutr. 1999 Sep;54:271-283.
14. Noor N, Satapathy KB. Diversity of medicinally important leafy vegetables used by the tribes in Balasore district of Odisha, India. Plant Sci Today. 2022 Oct 1;9(4):950-954.
15. Sahu P, Biswal M, Mishra N. Use of underutilized green leafy vegetables as food nutrition and ethnobotanical among rural community of Odisha: A review. Inter J Chem Stud. 2020;8(5):851-859.
16. Sahu AR, Ekka N. A preliminary report on the use of leafy vegetables by the natives of Bargarh district, Western Odisha, India. Int J Appl Res. 2021;7(5):218-223.
17. Di Carlo G, Mascolo N, Izzo AA, Capasso F. Flavonoids: old and new aspects of a class of natural therapeutic drugs. Life Sci. 1999 Jun 18;65(4):337-353.
18. Buragohain J, Singh VB, Deka BC, Jha AK, Wanshnong K, Angami T. Collection and evaluation of some underutilized leafy vegetables of Meghalaya. Indian J Hill Farming. 2013 Dec 1;26(2):111-115.
19. Noor N, Satapathy KB. Indigenous leafy vegetables: A super-food and a potent drug for future generation. Int J Botany Stud. 2020;5(3):146-153.
20. Haines HH. The botany of Bihar and Orissa, 6 parts. London: Adlard and Son Ltd.; 1921-1925.
21. Saxena HO, Brahmam M. The flora of Orissa. Vol. 1-4. Bhubaneswar (Orissa): Regional Research Laboratory and Forest Development Corporation of Orissa; 1994-1996.
22. Mooney HF. Supplement to the botany of Bihar and Orissa. Ranchi: Catholic Press; c1950.
23. Watcho P, Nkouathio EB, Nguelefack TB, Wansi SL, Kamanyi A. Antidiarrhoeal activity of aqueous and methanolic extracts of Oxalis corniculata Klotzsch in rats. Cameroon J Exp Biol. 2005;1(1):46-49.
24. Mukherjee S, Koley H, Barman S, Mitra S, Datta S, Ghosh S, *et al*. Oxalis corniculata (Oxalidaceae) leaf extract exerts in vitro antimicrobial and in vivo anticolonizing activities against Shigella dysenteriae 1 (NT4907) and Shigella flexneri 2a (2457T) in induced diarrhea in suckling mice. J Med Food. 2013 Sep 1;16(9):801-809.
25. Kirtikar KR, Basu BD. Indian medicinal plants. Buwaneśwari Āśrama; c1918.
26. Das AK, Bigoniya P, Verma NK, Rana AC. Gastroprotective effect of Achyranthes aspera Linn. leaf on rats. Asian Pac J Trop Med. 2012 Mar 1;5(3):197-201.
27. Mishra V, Mishra SK, Onasanwo SA, Palit G, Mahdi AA, Kumar S, Agarwal VL. Antiulcer potential of leaves of Achyranthes aspera Linn. in rats. Natl Prod Indian J. 2014;10:123-129.
28. Sharma V, Chaudhary U. An overview on indigenous knowledge of Achyranthes aspera. J Crit Rev. 2015 Jan 1;2:7-19.