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NEWSLETTER **ON** **Traditional Leafy Vegetables**




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EDITORIAL



West Bengal is rich with diversities of wild leafy vegetables that are collected from wild and some of these are being now cultivated. These plants mainly grow in forests, waste lands, agricultural and nonagricultural fields, from the sides of roads and water bodies. Wild green leafy vegetables cover major area in nutritional since time immemorial and has played an important role in human life. Leafy vegetables are an important component of the biodiversity and help to mitigate the micronutrient deficiency diseases. Wild leafy vegetables cover nutrient and immunity deficiency among the people. Millions of people do not have enough food to meet their nutrient but leafy vegetables almost overcome these problems and it also contributes to household food security and generating additional income and as a source of livelihood.

DESKU EIACP prepared a newsletter on leafy vegetables and it contains an article on 'Studies on Some Uncultivated, Traditional Leafy Vegetables of Nadia District of West Bengal, India'. This article describes how the leafy vegetable is important for our life.



Prof. Kausik Mondal

INSTRUCTIONS TO CONTRIBUTORS

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EIACP PC- RP on Environmental Biotechnology, University of Kalyani

Studies on Some Wild and Traditional Leafy Vegetables of Nadia, West Bengal, India

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Abstract

Nine different vegetable markets of Nadia district of West Bengal, India were visited and a total of 22 species of wild and traditional leafy vegetables, under 22 genera and 19 families, were found to be consumed by the local people. Among 22 leafy vegetables, two belong to fern families and maximum number has been recorded from Amaranthaceae, followed by Araceae family. It has also been found from the present study that the frequency of occurrence of leafy vegetable as 'frequent', 'intermediate' and 'rare' species are 36.36%, 40.91% and 22.73% respectively. The studied leafy vegetables are very rich in various groups of nutrients as well as different bioactive compounds. It was noticed from the present survey that each plant species also has different medicinal as well as nutritional properties.

Keywords: Wild vegetables, Nadia district, Leafy Vegetables, Traditional vegetables, Medicinal vegetables

Introduction

All the basic needs of human beings are fulfilled directly or indirectly by different plant species and its products. Since time immemorial, useful plants have been utilized by human societies for medicinal and food purposes. It became necessary to explore newer plant resources and their multifarious utilization due to exponential increase in human population and fast decrease in natural resources (Joshi, 2005). In nature, there are many underutilized greens having promising nutritive and medicinal value, which can nourish the ever-increasing human

population (Sheela *et al.*, 2004). Green leafy vegetables in our country are known to be the most inexpensive source of several vital nutrients (Kamble and Jadhav, 2013). The aim and objectives of this study, searching and exploring of wild and traditional leafy vegetables for greater uses for mankind. In different parts of our country, different communities of people consume various leafy vegetable locally which can be surfaced for scientific as well as larger social exploration.

Different communities of people, living in different corners of the district, show various types of food habits and particularly, consume a variety of wild leafy vegetables traditionally. The detail know how of these leafy vegetables is very important for nutritional as well as medicinal values.

Materials and Methods

The sampling location Nadia district is a cultural district of West Bengal, situated at the bank of river Hooghly (**Fig. -1**). To know about the wild and traditional leafy vegetables used by the people of Nadia district, different vegetable markets were visited and the various types of leafy vegetables which were available in the said markets were recorded. The frequency of occurrence (frequent, intermediate or rare), local names, sources (cultivated or wild) and mode of use etc. of various leafy vegetables used by the different communities of people were also noted through informal interview with the local peoples and vegetable sellers of different markets of Nadia district. The study area Nadia district is located in southern part of West Bengal and lies in between 22°53' N and 24°11' N latitude and 88°09' E and 88°48' E longitude and it covers a total area of 3927 km² and having eastern side with international border of Bangladesh. The detail of markets surveyed during the investigation was extracted in **Table – 1**.

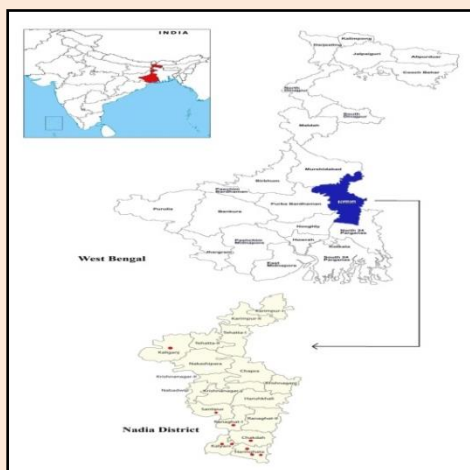


Fig. – 1. Map of the study area, Nadia, W. B
Source: Edited from -www.mapsofindia.com

Identification of the leafy vegetables was done in the field condition while others which could not be readily identified were brought to the laboratory of the Fatepur High School, Haringhata and were identified with the help of different books and literature. Details of leafy vegetables i.e. active principles and other compound present, medicinal values (if any) etc. had been documented from different literatures.

Table-1. Details of nine different vegetable markets situated at different blocks of Nadia District.

Sl. No.	Name of the market	Block Name	Latitude & Longitude
1.	Barajaguli vegetable market	Haringhata	22.947°N, 88.545°E
2.	Haringhata vegetable market	Haringhata	22.962°N, 88.569°E
3.	Birohi vegetable market	Haringhata	22.994°N, 88.546°E
4.	Kalyani 1no. vegetable market	Kalyani	22.976°N, 88.444°E
5.	Madanpur Bazar	Kalyani	23.008°N, 88.490°E
6.	Aistala vegetable market	Ranaghat	23.188°N, 88.559°E
7.	Debagram vegetable market	Kaliganj	23.716°N, 88.296°E
8.	Barabazar Vegetable market	Santipur	23.238°N, 88.437°E
9.	Chakdaha Bazar	Chakdaha	23.080°N, 88.529°E

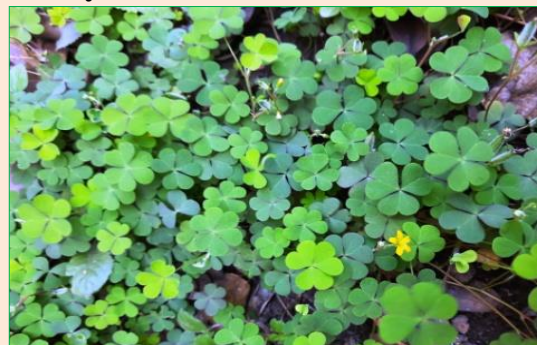
Results and Discussion

The details of wild, traditional leafy vegetables consumed by the different communities of people of Nadia District were illustrated below along with their vernacular name, botanical name, family, frequency of occurrence, edible parts, mode of use, active principles as well as their medicinal importance. The family wise distribution and occurrence of the different edible plant species are shown in Fig 2 & 3.

1. *Oxalis corniculata* L.

Vernacular name: *Amrulshak* (Beng.), Yellow sorrel (Eng.)

Family: Oxalidaceae



Frequency of Occurrence: Frequent

Edible parts: Whole aerial parts

Mode of use: With other vegetables it is eaten as vegetable in curry mixed and also used to cook chutney.

Active constituents and other compounds present: Flavones (7,4'-diOMe apigenin and acacetin), glycoflavones (4'-OMeiso-vitexin, 4'-OMe vitexin and 3',4'-diOMe orientin), flavonols (3',4'-diOMe quercetin) and phenolic acids such as p-hydroxyl benzoic, tartaric acid and citric acids, vanillic and syringic acids, calcium oxalate, oxalate, 6-C-glucosyl luteolin (isorientin), isovitexin 7- methylether (sertisin) and 6-C-glucosylapigenin (isovitexin) (Merugu *et al.*, 2015).

Medicinal importance: Oxalis is used to treat anorexia (Ediriweera, 2007), dyspepsia, anemia, dysentery, tympanitis and piles (Lal *et al.*, 2012; Satapathy *et al.*, 2012), appetizer, cough, scurvy, rickets and jaundice (Kumari and Kumar, 2000).

2. *Amaranthus spinosus* L.

Vernacular name: *Kantanotey* (Beng.),
Spiny Amaranth (Eng.)

Family: Amaranthaceae



Frequency of Occurrence: Frequent

Edible parts: Whole plants except roots

Mode of use: Eaten as fried vegetable and also as curry mixed.

Active constituents and other compounds present: 7-p coumaroyl, 4-o-beta-D-glucopyranoside, apigenin, xylofuranosyl, b-sitosterol, isoamaranthanthine, linoleic acid, betanin, gompherenin, betacyanin, amaranshine, betalains, kaempferol, betaxanthin, glucoside, quercetin, hydroxyl cinnannamates, beta-D-ribofuranosyl, uracil, rutin, adenine.

Medicinal importance: This plant species is used to protect obesity (Ediriweera, 2010), eczema or abscesses, dysuria (Satapathy *et al.*, 2012), burns, wounds, inflammation, indigestion (Rajasab and Mahamad, 2004). It is also used as laxative, emollient and has spasmolytic, diuretic effect (Khare, 2007).

3. *Coccinia grandis* (L) J.Voigt.

Vernacular name: *Telakochu* (Beng.),
Ivy gourd/Scarlet gourd (Eng.).

Family: Cucurbitaceae

Frequency of Occurrence: Frequent

Edible parts: Young leaves, stem and fruits.

Mode of use: Young, tender and long slender stem tops, leaves are cooked and young fruits are used in salads. Its root also used as medicinal purpose.



Active constituents and other compounds present: Heptacosane, Cephalandrol, β -sitosterol, alkaloids cephalandrins A and B, β -amyrin acetate, lupeol, cucurbitacin B, Taraxerone, Taraxerol, β -carotene, Lycopene, Cryptoxanthin, Xyloglucan, Carotenoids, β -sitosterol, Stigma-7-en-3-one. Root - Resin, Alkaloids, Starch, Fatty Acids, Carbonic acid, Triterpenoid, Saponin Coccinoside, Flavonoid Glycoside, Lupeol, β -amyrin, β -sitosterol, Taraxerol (Deokateet *et al.*, 2011).

Medicinal importance: Anti-diabetic, oxidant, larvicidal, GI disturbances, Cooling effect to the eye, Gonorrhoea, hypolipidemic, skin diseases, urinary tract infection. Hypoglycemic, analgesic, anti-pyretic, Hepatoprotective, tuberculosis, eczema, anti-inflammatory, expectorant, antispasmodic, asthma, bronchitis, GIT disturbances, urinary tract infection, skin diseases, hypoglycemic, anti-diabetic, skin diseases, removes pain in joint, urinary tract infection.

4. *Boerhaavia diffusa* L.

Vernacular name: *Purnanava* (Beng.),
Hogweed (Eng.)

Family: Nyctaginaceae



Frequency of Occurrence: Intermediate

Edible parts: Young leafy shoot

Mode of use: Fried and eaten as vegetable and also as curry mixed with other vegetables.

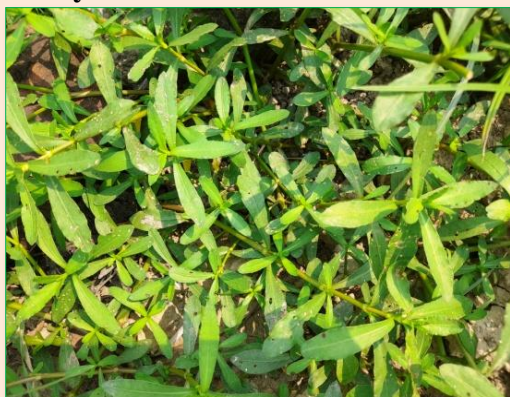
Active constituents and other compounds present: Beta-sitosterol, punarnavine-1 and 2, ursolic acid, oxalic acid, myrastic acid, alkaloids and polysaccharides.

Medicinal importance: It is used to cure jaundice, general debility, diabetes, epilepsy, dysentery, dropsy, ophthalmia, gonorrhoea and night blindness (Das and Mukherjee, 2015).

5. *Alternanthera sessilis* (L.) R. Br. Ex DC.

Vernacular name: *Sanchi/Shantishak* (Beng.), *Sissoo Spinach* (Eng.)

Family: Amaranthaceae



Frequency of Occurrence: Frequent

Edible parts: Leaves and soft stem

Mode of use: Fried and eaten as vegetable

Active constituents and other compounds present: Kaempferol saponins, amino acid such as leucine, arginine, lysine, isoleucine, threonine and tryptophan, fat, proteins, vitamin A, C, E, K, B9 (folic acid), niacin, riboflavin, thiamine, calcium, magnesium, iron.

Medicinal importance: Hepato-protective, anti-oxidant, nutritive, eye health, blood tonic, appetizer etc. (Balachandar *et al.*, 2013; Gupta and Singh, 2012).

6. *Centella asiatica* (L.) Urban.

Vernacular name: *Thankuni* (Beng.)

Family: Apiaceae



Frequency of Occurrence: Intermediate

Edible parts: Whole plants

Mode of use: Eaten raw and also used to curry with other vegetables.

Active constituents and other compounds present:

Glucosideasiaticoside, pectic acid, asiatic acid, vellarine and resin.

Medicinal importance: This plant species is used to cure anaemia, dermatosis, diabetes, dysphonia, cough, insanity, leprosy and skin diseases (Das and Mukherjee, 2015).

7. *Marsilea guardifolia* L.

Vernacular name: *Sushni* (Beng.)

Family: Marsileaceae (fern)



Frequency of Occurrence: Intermediate

Edible parts: Whole aerial parts

Mode of use: Fried and eaten as vegetable and also in curry mixed with other vegetables.

Active constituents and other compounds present: Saponin, phenol, flavonoid, tanins, quinones, coumarins, terpenoids, anthroquinones and alkaloids.

Medicinal importance: This green leafy vegetable is used to cure psychopathy,

ophthalmia, diarrhoea, bronchitis, leprosy, fever, skin disease, sedation, haemorrhoids, dyspepsia and insomnia. It has also diuretic, anti-inflammatory properties (Dhanam and Elayaraj, 2014).

8. *Amaranthus viridis* L.

Vernacular name: *Notey* (Beng.),
Amaranth (Eng.)

Family: Amaranthaceae



Frequency of Occurrence: Frequent

Edible parts: Whole plants except roots

Mode of use: Fried and eaten as vegetable and also in curry mixed with other vegetables.

Active constituents and other compounds present: Carotenoids, flavonoids, ascorbic acid, and phenolic acids.

Medicinal importance: This leafy vegetable is used as anti-nociceptive, blood tonic and anti-pyretic (Bagepalli *et al.*, 2009).

9. *Enhydra fluctuans* Lour.

Vernacular name: *Helencha* (Beng.)

Water Cress (Eng.)

Family: Asteraceae



Frequency of Occurrence: Intermediate

Edible parts: Whole aerial parts

Mode of use: Eaten as vegetable in curry mixed with other vegetables.

Active constituents and other compounds present: Saponins, β -carotene, myricyl alcohol, kauroil, sitosterol, cholesterol, glycoside, sesquiterpene lactones, germacranolide, flucuanin, enhydrin, fluctuandin, diterpenoid acids and their isovalerate and angelate derivatives, stigma sterol, glycoside.

Medicinal importance: *Enhydra fluctuans* is used as laxative and antibilious and used to cure inflammation, Leucoderma, bronchitis and biliousness. It is also useful in skin and nervous affections and useful in torpidity of the liver, cooling agent (Yusuf and Oluowle, 2009).

10. *Moringa oliefera* Lam.

Vernacular name: *Sajina* (Beng.),
Drumstick tree (Eng.)

Family: Moringaceae



Frequency of Occurrence: Frequent

Edible parts: Leaves

Mode of use: Fried and eaten as vegetable and also as curry mixed with other vegetables.

Active constituents and other compounds present: Niazimicin, 4-(α -L-rhamnopyranosyloxy) benzyl isothiocyanate, 4-(4'-O-acetyl- α -L-rhamnopyranosyloxy) benzyl isothiocyanate, pterygospermin, and 4-(α -L-rhamnopyranosyloxy) benzyl glucosinolate, carotenoids (β -carotene or provitamin A).

Medicinal importance: This plant species has anti-cancer, anti-hyperlipidemia, anti-oxidant and anti-microbial properties. It is also used as nutritive laxative, relieves joint pain, maintains eye health and blood tonic (Goyal *et al.*, 2007).

11. *Colocasia esculanta* (L.) Schott.

Vernacular name: *Kachu* (Beng.), Taro/arum (Eng.)

Family: Araceae



Frequency of Occurrence: Frequent

Edible parts: Leaves and rhizome

Mode of use: Fried and eaten as vegetable and also in curry mixed with other vegetables. Sometimes also used with fishes.

Active constituents and other compounds present: β -sitosterol, Flavonoids, and steroids, calcium, iron, and phosphorus. Young leaves are rich in vitamin C.

Medicinal importance: This plant is used as styptic, stimulant (Lal *et al.*, 2012), laxative, useful in congestion of portal system (Khare, 2007), leaves rich in vitamins and minerals (Manju *et al.*, 2011).

12. *Hygrophila auriculata* (Schumach.) Heine.

Vernacular name: *Kulekhara* (Beng.)

Family: Acanthaceae



Frequency of Occurrence: Rare

Edible parts: Whole plants except roots and spine.

Mode of use: Fried and eaten as vegetable and also in curry mixed with other vegetables.

Active constituents and other compounds present: Lupenol, stigmaterol, mucilage, xylose, potassium salts, uronic acid, stearic acid, palmitic acid, oleic acid and linoleic acid.

Medicinal importance: This plant is useful against thirst, arthritis, bladder stones, dysentery, eye diseases, dropsy, jaundice and rheumatism (Das and Mukherjee, 2015).

13. *Ipomoea aquatic* Forsk.

Vernacular name: *Kalmi* (Beng.),

Water spinach (Eng.)

Family: Convolvulaceae



Frequency of Occurrence: Intermediate

Edible parts: Leaves and soft stem

Mode of use: Fried and eaten as vegetable and also as curry mixed with other vegetables.

Active constituents and other compounds present: N-cis-Feruloyltyramine, $3\alpha,7\beta$ -O-D-di glycopyranosyl-dihydroquercetin, N-trans-Feruloyltyramine, Protein, vitamin B2, calystegines B1, Nortropane alkaloids, phenolic compounds and Isochlorogenic acid a, b and c, nicotinic acid, vitamin E, riboflavin, essential amino acids, leucine, lysine and threonine, calcium, potassium, phosphorus, sodium, magnesium, zinc, copper, iron and manganese.

Medicinal importance: This leafy vegetable is used to purify blood and cure gonorrhoea, (Manju *et al.*, 2011) Rheumatism, inflammations and used as antioxidant (Sahu *et al.*, 2013), purgative (Lal *et al.*, 2012).

14. *Paederia foetida* L.

Vernacular name: Gandhavadulia (Beng.), Chinese moon creeper (Eng.)

Family: Rubiaceae



Frequency of Occurrence: Rare

Edible parts: Leaves

Mode of use: Eaten as vegetable in curry mixed with other vegetables.

Active constituents and other compounds present: Benzofuran, linalool, cetyl alcohol, hentriacotan, hentriacontanol, dimethyl sulphide and sulphur containing compounds, dimethyl trisulphide, sitosterol, ursolic acid, camestrol, stigmaterol, fatty acid, nonionic acid, lauric acid, capric acid, myristic, palmitic, arachnidic and vitamin C.

Medicinal importance: This plant species is used as hepatoprotective, anti-tussive, antioxidant, anti-spasmodic, anthelmintic and immunity enhancer. It also stimulates central nervous system, abdominal pain and rheumatoid arthritis.

15. *Mentha arvensis* L.

Vernacular name: Pudina (Beng.), Mint (Eng.)

Family: Lamiaceae

Frequency of Occurrence: Rare

Edible parts: Leaves

Mode of use: Eaten raw and also cooked as chutney



Active constituents and other compounds present: Limonene, 1, 8-cineole, linalool, carvone, linalyl acetate, menthone, menthol, piperitenone oxide, and menthyl acetate.

Medicinal importance: Pudina is used to prevent functional gastrointestinal and gallbladder disorders and flatulence (Khare, 2007).

16. *Nyctanthes arbortristis* L.

Vernacular name: Shiuli/Parijat (Beng.), Night Jasmine (Eng.)

Family: Nyctanthaceae



Frequency of Occurrence: Frequent

Edible parts: Leaves

Mode of use: Eaten as vegetable in curry mixed with other vegetables.

Active constituents and other compounds present: Lycoside, tannic acid, mannitol, methylsalicylate, resin and volatile oil.

Medicinal importance: This leafy vegetable is useful against helminthiasis, inflammations, chronic fever, dyspepsia, pruritus, asthma, bronchitis, cough, constipation, greyness of hair and baldness (Das and Mukherjee, 2015).

**17. Polycarpon prostratum (Forsk.)
Aschers. and Schweinf.**

Vernacular name: Gimashak (Beng.)

Family: Caryophyllaceae



Frequency of Occurrence: Intermediate

Edible parts: Whole aerial parts

Mode of use: Fried and eaten as vegetable and also in curry mixed with other vegetables.

Active constituents and other compounds present: Polycarponin B and C, triterpenoid saponin, Etrahydroxytriterpenes, betaamyryn and its acetate, betasitosterol and stigmasterol.

Medicinal importance: This plant species is used to cure cough and fever, particularly after measles (Das and Mukherjee, 2015).

18. Portulaca oleracea L.

Vernacular name: Baraloniya/
Nunia/Gadumoni (Beng.), Common
purslane (Eng.)

Family: Portulacaceae



Frequency of Occurrence: Intermediate

Edible parts: Whole aerial parts

Mode of use: Eaten as vegetable in curry mixed with other vegetables.

Active constituents and other compounds present: Gallotannins, omega-3 fatty acid, ascorbic acid, α -tocopherols, kaempferol, quercetin, apigenin and high percentage of potassium.

Medicinal importance: Useful against disease of liver, spleen, kidney, bladder, cardio vascular disease, scurvy, dysentery, dysuria and lceration of mouth (Das and Mukherjee, 2015).

19. Chenopodium album (L.)

Vernacular name: Betoshak (Beng.)

Family: Chenopodiaceae



Frequency of Occurrence: Intermediate

Edible parts: Aerial shoot

Mode of use: Fried with brinjals and chilies. Sometimes cooked as curry with other vegetables.

Active constituents and other compounds present: Alkaloids, xyloside, carotenoids, Limonene, α -terpinyl acetate, cisascaridole and α - terpinene.

Medicinal importance: This species has anti-ulcer, anti-nociceptive, hepato-protective and nutritive properties (Nigam and Paarakh, 2011; Jain and Singhai, 2012). It is also used to protect leucoderma, anthelmintic (Lal *et al.*, 2012; Satapathy *et al.*, 2012), abdominal pain, gastric (Razzaq *et al.*, 2013), seminal weakness, cardiac disorders, general debility (Jeeva *et al.*, 2006).

20. *Bacopa monnieri* (L.) Pennel.

Vernacular name: *Bramhishak* (Beng.)

Water hyssop (Eng.)

Family: Scrophulariaceae



Frequency of Occurrence: Rare

Edible parts: Whole plants except roots

Mode of use: Fried and eaten as vegetable and also in curry mixed with other vegetables.

Active constituents and other compounds present: Alkaloids brahmine, herpestine, nicotine, D-mannitol, hersaponin, apigenin, monnierasides I–III, cucurbitacin, plantainoside-B, Aglycone and bacosides.

Medicinal importance: Bramhi is used as brain tonic, fever (Jeeva *et al.*, 2006), epilepsy (Satapathy *et al.*, 2012), enhance memory (Bhattacharya and Borah, 2008), skin diseases, leprosy, epilepsy, eczema, asthma, diseases of nervous system (Manju *et al.*, 2011).

21. *Ampelopteris proliferata* Kunze.

Vernacular name: *Dhekishak* (Beng.)

Fiddlehead Ferns (Eng.)

Family: Thelypteridaceae

Frequency of Occurrence: Rare

Edible parts: Pinnae and pinnule

Mode of use: Fried and rarely eaten as vegetable in curry mixed with other vegetables. Also used as salad.



Active constituents and other compounds present: Flavonoids and phenolics compounds.

Medicinal importance: It is used as antibiotic and antimicrobial substances (Das and Mukherjee, 2015).

22. *Typhonium trilobatum* Schott.

Vernacular name: *Ghetkochu* (Beng.)

Bengal Arum (Eng.)

Family: Araceae



Frequency of Occurrence: Intermediate

Edible parts: Leaves and rhizome

Mode of use: Eaten as vegetable in curry with other vegetables.

Active constituents and other compounds present: Thiamine, carotene, niacin, folic acid, sterols and B-sitosterol, proteins, calcium, phosphorus, iodine, iron, fluoride, sodium and potassium.

Medicinal importance: This plant is useful against cough, vomiting, excessive

expectoration, asthma, gastric ulcer headache, and abscess (Das and Mukherjee, 2015).

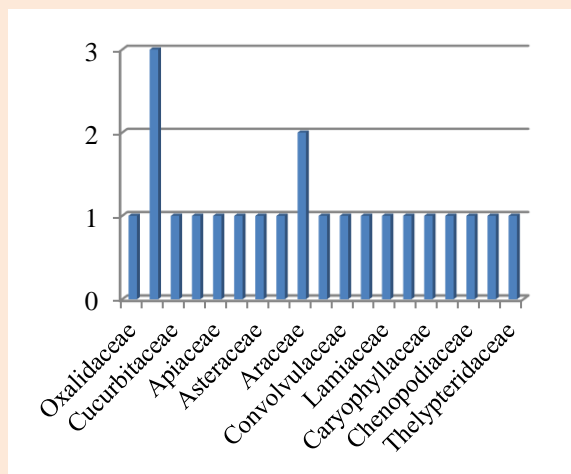


Fig. 2. Family-wise distribution of different leafy vegetables

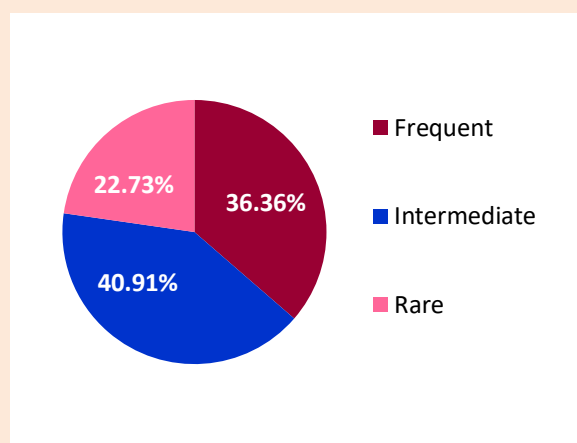


Fig. 3. Frequency of occurrence of different leafy vegetables

Conclusion

The present study showed that there are 22 species of leafy vegetables under 22 genera and 19 families, of which two species viz. *Ampelopteris prolifera* and *Marsilea quardifolia* are belonging to fern families, Lypteridaceae and Marsileaceae respectively. Maximum number of leafy vegetables (three in number) are belonging to the family Amaranthaceae followed by Araceae (two in number). It is revealed from the present survey that rest of the families i.e. Oxalidaceae, Cucurbitaceae, Nyctaginaceae, Apiaceae, Asteraceae, Moringaceae, Acanthaceae, Convolvulaceae, Rubiaceae, Lamiaceae, Nyctanthaceae,

Caryophyllaceae, Portulacaceae, Chenopodiaceae, Scrophulariaceae, has one leafy vegetable each.

In most of the cases, leaf, young shoot or whole plants of leafy vegetables are consumed by the people of Nadia district. As far as the frequency of occurrence of uncultivated, leafy vegetables is concerned, it has been found from the present study that the percentage of occurrence as 'frequent', 'intermediate' and 'rare' species were 36.36%, 40.91% and 22.73% respectively.

The studied leafy vegetables are very rich in various groups of nutrients as well as different active principles. It was noticed from the present survey that each and every plant species have different medicinal properties like anti-cancer, useful against cough, asthma, memory enhancer, anti-ulcer, anti-nociceptive, useful against disease of liver, spleen, kidney, bladder, cardio vascular disease and so on. These plants should be properly identified, conserved and awareness generation for their nutritional and medicinal value.

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World Environment Day-2024 celebrated by DESKU-EIACP PC-RP, KU

The World Environment Day was celebrated on 5th June every year to raise awareness about the importance of the environment and promote environmental protection actions globally coined by United Nations Environment Programme (UNEP). This year it is hosted by **The Kingdom of Saudi Arabia**, because the country is facing issues like desertification, degradation and drought, they are deeply invested in the event to deliver solutions and raise awareness. This year the theme of World Environment Day 2024 is '**Land restoration, desertification and drought resilience**' and the campaign highlights the slogan **“Our Land Our Future.**

This year Environmental Information, Awareness, Capacity Building and Livelihood Programme (EIACP) secretariat, Supported by Ministry of Environment, Forest and Climate Change (MoEF& CC), Govt. of India, assigned to celebrate the World Environment Day through its network in three parts like Pre Event (15.05.2024 to 25.05.2024, Social Media related activities), Event (26.05.2024 to 04.05.2024 Activities including Events/Programmes/Competitions) and Culmination (05.06.2024, World Environment Day Celebration).

Accordingly the DESKU Environmental Information, Awareness, Capacity Building and Livelihood Programme (EIACP) PC-RP on Environmental Biotechnology, University of Kalyani, West Bengal, was celebrated the world Environment day from 15th May, to 5th June, 2024 through following activities.

- Preparation of Infographic on different themes (Pre Event, 15.05.2024 to 25.05.2024).
- Organized a webinar on Bio-technical Restoration of Degraded Mine Lands on 27th May 2024. Speaker Dr. Sukalyan Chakroborty, BIT - Meshra, Ranchi. More than 60 numbers of participants from school, college and university students, Research Scholars, faculty and staff members were participated in the programme.
- Plantation programme in University Campus on 28th May 2024.
- Plogging (awareness drive on pick up trash and run) programme on 29th May, 2024 at Boy's hostels, University of Kalyani.
- On 30th May, 2024 photography contest was conducted at PG-1, Hostel, University of Kalyani.
- On 31st May, 2024 Debate on world environment day-2024 theme was conducted at Banyan, Hostel, University of Kalyani.
- On 1st and 2nd June, 2024 drawing competition on world environment day-2024 theme was conducted at Ranaghat, Nadia, West Bengal.
- On 3rd June, 2024 quiz competition on world environment day-2024 theme was conducted at PG-1, Hostel, University of Kalyani.
- The valedictory session of the programme was celebrated on 5th, June, 2024

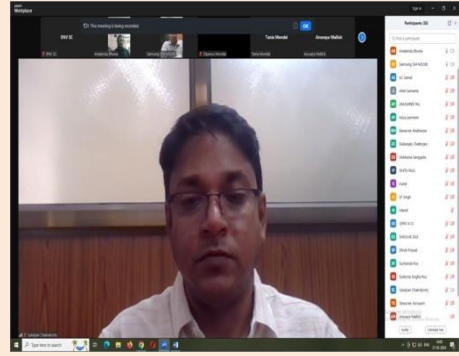
Photographs of some activities



Infographic on Land Restoration



Banner displayed on this theme in front of the University gate



**Webinar Speaker
Dr. Sukalyan Chakraborty,
BIT - Meshra, Ranchi**



**Plantation programme by
Hon'ble Vice Chancellor**



**Plogging awareness drive at Boy's
hostels, KU**



Debate conducted at PG, Hostel, KU



**Drawing competition at
school level**



Quiz conducted at PG, Hostel, KU



**valedictory session of the WED
programme**



Group photographs of participants with prizes and certificates

FORTHCOMING EVENTS		
Event	Date	Place & Correspondence
National Conference on BioTechnology and BioMedicines (NCBB)	15 th Jun 2024	Kolkata, India https://www.nationalconference.in/event/index.php?id=2482545
International Conference on Biofuels and Environmental Biotechnology (ICOBEB)	19 th Jun 2024	Ndola, Zambia https://www.iierd.org/events/index.php?id=2279057
International Conference on Environmental Bioremediation, Biotransformation, Biotechnology and Biosustainability (ICEBBBB)	21 st Jun 2024	Melbourne, Australia https://www.researchfora.net/event/index.php?id=2280661
International Conference on Food and Agricultural Biotechnology (ICFAB)	27 th Jun 2024	Alexandria, Egypt https://scholarsforum.org/event/index.php?id=2383901
9th International Congress & Exhibition on Arsenic	20 -24 th , October 2024	KIIT, Bhubaneswar, 751024 India https://as2024.kiit.ac.in/

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<p>FROM: DESKU EIACP RP DEPARTMENT OF ENVIRONMENTAL SCIENCE, UNIVERSITY OF KALYANI KALYANI-741235, NADIA WEST BENGAL</p>	<p>BOOK POST</p> <p>TO</p> <hr/> <hr/> <hr/>
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