

Current Status Of Wild Edible Plants Consumed By The Local People Living In The Coal Field Region Of Jharia Block Of Dhanbad District Of Jharkhand

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Abstract: Wild edible plants are the traditional as well as the primary source of food and medicine for the local people living in the rural areas of the coalfield region of Jharia block of Dhanbad district of Jharkhand. Due to lack of knowledge regarding the plants and its consumption it remains underutilized in most of the urban population and are gradually eliminating from the earth due to several anthropogenic activities and continuous mining. The aim of this study includes survey of wild edible plants and to analyse and catalogue such knowledge based on Relative Frequency Of Citation (RFC) and used value (UV).

Keywords: wild edible plants, coal field region, Quantitative analysis, coal field plants, Jharia block plants, medicinal plants.

I. INTRODUCTION:

Jharkhand is one of the Indian state which is also known as the “region of forest” because of its huge forest region. The state lies in the eastern part of India and is spreading in area of 7.97 million hectares. Over a long period of time number of plants are used in some form or the other by the people (tribals and non-tribals) are living over here. Plants are used either for eating on a regular basis in different forms or as a medicine for treating various ailments. These wild plants grow naturally and are considered as weeds and remain underutilized in almost all the urban areas. Although they are collected and are used by the local communities in some rural areas and also they sold in some of local markets but still they are considered as “food of poor”. Due to lack of sufficient irrigation and farming facilities proper food is not provided to the local people living in rural areas but these wild plants provide nutritional components like proteins, fibres, vitamins, minerals, as well as non-nutritive phytochemical compounds like phenolic compounds, flavonoids and bioactive peptides, have proven health promoting effects (Hora and Topno 2015; Salvi and Katewa 2016). The state is rich in biodiversity of medicinal plants and their traditional uses (Mairh et al 2010, Lal and Singh 2012).

The present study examined whether (i) local inhabitants are knowledgeable about the use of these plants (ii) local inhabitants use the plants for herbal medicine or for regular eating. (iii) different plants with their names and purpose of use (iv) the quantitative analysis of the plants of use.

To our knowledge no proper exploration had previously been conducted in this area. As these plants are not cultivated and sold in all the markets the information gained from this study may help in conducting further studies and supporting continued practice and preservation of traditional knowledge of Jharkhand and elsewhere.

II. Study Area:

Dhanbad is a city in the Indian state of Jharkhand known as “Coal Capital of India” due to its extensive coal mining industry located in the Chhota Nagpur Plateau and has an average elevation of 227 meters. Jharia is located in Dhanbad district of Jharkhand in the Damodar River Valley, covers approximately 450 sq. kilometres (about 110 square miles or 280 sq. km as per some sources) holds the largest coal reserve in India around 19.4 billion tons. Besides the immediate dangers the under ground fire have rendered once fertile land barren and contaminated local water sources. Although the town have all the access to modern health facilities due to industrialization and the associated modern culture but still the people (tribals and non-tribals) uses wild edible plants as a source of food and medicine due to their cultural practices besides having difficulties in access to modern health facilities.



FIG: Map of India showing Jharkhand



FIG:Map of Jharkhand showing Jharia

III. DATA COLLECTION AND METHODOLOGY:

The field data was collected during the period of October 2024 to May 2025. Field visit consists of data documentation, plant collection and photography. During the collection of specimen there was combination of focus group, individual interview, field walk and open end questionnaire was conducted during each field visit session of Data collection. A total of 15 women, 12 men and 3 Vaidya's (traditional healers) were interviewed. Most of the informants belonged to the age between 35 to 70 years. Picture of plant were taken with GPS camera in order to get the location, proper authenticity. Identification of plants were done with the help of Hains Flora(1925) and apps like plant snap, I naturalist, picture This. Complete details of the plants like local name, parts of the plants their use and various methods in which plants are consumed etc was asked during open end questionnaire. Plants were collected from barren lands, waste lands, moist and marshy places, near road side, agriculture farms and others. Mainly the informants were chosen based on their rich indigenous knowledge and long term experience of utilization of plants.

IV. IMAGES OF PLANTS REPORTED IN THE STUDIED AREA





V.DETAILS OF THE PLANTS REPORTED IN THE STUDIED AREA:

SCIENTIFIC NAME	COMMON NAME	VERNACULAR NAME	FAMILY	PART OF THE PLANT USED
<i>Achyranthes aspera</i>	Apamarg ,prickly chaff flower	Latchichra	Achyranthaceae	Roots, seeds, shoots,leaves
<i>Aerva lanata</i>	Aerva	Dahiya saag	Amaranthaceae	Roots,leaves,flower,stem
<i>Alangium salvifolium</i>	Sage-leaved alangium, ankol	Dhela	Cornaceae	Roots,,leaves,bark,seeds,fruits.
<i>Alternanthera philoxiroids</i>	Alligator weed	Sarauchi saag	Amaranthaceae	Leaves,stalks,young shoot
<i>Amaranthus viridis</i>	Green amaranth	Jangli chaurai	Amaranthaceae	Leaves,stem,seeds.
<i>Chenopodium ficifolium</i>	Fig-leaf-goosefoot	Anjari bathua	Amaranthaceae	Leaves,seeds,flower buds
<i>Clitoria ternatea</i>	Butterfly pea,climbing vine	Aprajita	Fabaceae	Roots,,leaves,flower,young shoots,tender pods,seeds.
<i>Commelina benghalensis</i>	Fire leaf	Kanna saag	Commelinaceae	Leaves,rhizomes,whole plant.
<i>Cordia myxa</i>	Assyriam plum	Lasoda	Boragineaceae	Leaves,fruits,bark.
<i>Euphorbia hirta</i>	Asthma weed	Doodhi saag	Euphorbiaceae	Roots,,leaves,stem,whole plant
<i>Ficus virens</i>	White fig	paakad	Moracea	Young leaves, bark,fruits, latex
<i>Glinus oppositifolius</i>	Carpet weed	Gima saag	Molluginaceae	Young Leaves,stalks,whole plant
<i>Ipomea aquatica</i>	Water spinach	Kalmi saag, karmi saag	Convolvulaceae	Young Leaves,young shoot,stem.
<i>Oxalis stricta</i>	Yellow wood, sorrel	Khattimithi saag, netho saag	Oxalidaceae	Leaves,flower.young pods
<i>Portulaca oleracea</i>	Common purslane	Golgola, lonia saag	Portulacaceae	Leaves,stalks, seeds.
<i>Ricinus communis</i>	Castor bean	Redi, Redd,arandi	Euphorbiaceae	Roots,,leaves,seeds
<i>Scoparia dulcis</i>	Sweet broomweed,licorice weed	Krishna, bichhuvati	Plantaginaceae	Leaves,whole plant
<i>Sida rhombifolia</i>	Cuban jute	Pila bariyar	Malvaceae	Leaves,roots,stalks,whole plant
<i>Solanum nigrum</i>	Blacknight shade	Makoi,bulbul,bhatku iyan	Solanaceae	Young Leaves,shoots,ripe berries
<i>Tridax procumbens</i>	Tridax daisy	Manya arka	Asteraceae	Leaves,whole plant

VI.MORPHOLOGICAL CHARACTERISTICS OF THE PLANTS REPORTED IN THE STUDIED AREA.

Sln o.	Scientific name	Habit	Stem	Leaf	Root	Inflorescence
1.	<i>Achyranthes aspera</i>	Erect, annual or perennial herb with spreading branches, upto 1m tall.	Angular,ribbed, simple or sometimes branched from base and are reddish or purplish in colour.	Simple, opposite sessile without a petiole,may be round or oval variable in shape and size upto 12 cm long and 8 cm wide.	Tap root system, cylindrical and slightly ribbed with secondary and tertiary roots branching out from	Small, greenish white to purple, terminal spikes upto 75 cm long, bract membranous hardened perianth.

					the main root.	
2.	<i>Aerva lanata</i>	Semi erect, prostrate,	Branched, woolly from woody	Simple, alternate with small petiole. Leaf	Branches are	Small, greeny, creamy white ,
		many branched under shrub	base upto 50 cm in height.	blade is ovate, upper surface is pubescent and beneath its white woolly.	numerous , terete, covered with woolly- tomentose or pubescent texture.	sessile, born in axillary spikes solitary or in clusters.
3.	<i>Alangium salvifolium</i>	Sage-leaved small, bushy, offering a dense canopy with a short trunk.	Erect, cylindrical, branched with a solid structure, bark is rough and twig is grey or purple with spines	Simple, alternate, oblong lanceolate	Tap root, have smaller lateral root branching	White flowers, green buds, petals of flower curls backward, multiple atamen linear stigma
4.	<i>Alternanthera philoxeroides</i>	Perennial herb, grows as emerged aquatic plant rooted in the soil or in substrate	Fistular, grows upto 100 cm long	Simple leaf which are lance shape, waxy and dark green in colour upto 10 cm long and 2.5 cm wide	Adventitious roots forming at the nodes of its prostrate, hollow stem.	Bisexual, round white ball shaped on long stalks from upper leaf axis, each flower has 5 stamen 1 pistil and 4-5 papery bracts.
5.	<i>Amaranthus viridis</i>	Annual herb occasionally ascending, usually 10 to 80 cm tall	Densely branched, channelled, glabrous to pubescent.	2-7 cm long 1.5- 5.5 cm wide, triangular narrowly rhombic petiole upto 10 cm long, tip are usually narrow with a small narrow notch.	Tap root having tiny hair extension along with a network of branched secondary roots.	Green unisexual, triangular ovate to broadly lance shaped, 3 sepals, 2-3 stigma
6.	<i>Chenopodium ficifolium</i>	Initially erect , later tending to become recumbent due to weight of foliage and seeds , tend up to 3 m	Usually green , often ridged, typically erect simple 1.8-5.5 dm	Alternate , toothed , roughly diamond shaped 3-7 cm long and 3-6 cm broad , upper leaves entire lanceolate , rhomboid , mealy coated specially underside	Fibrous root system has many thin network of branching roots	Small , radially symmetrical , small cymes on dense branch , 10-40 cm long, bisexual

7.	<i>Clitoria ternatea</i>	Perennial, herbaceous plant, having climbing or trailing vine.	Selender round or fibrous, climb or trail, can reach upto 10 m in length, become woody with age.	Compound, 5-7 leaflets ovate or elliptic with round or obtuse apex typically 2.5- 5 cm long and 1.5-3.5 cm wide.	Robust or deep root system characterized by formation of root nodules.	Butterfly shaped, blue, pink, white or purple, axillary, solitary or in pairs upto 4 cm long and 3 cm wide, corolla consists of 5 petals.
8.	<i>Commelina benghalensis</i>	Annual herb creeping or procumbent upto 60-90 cm long	Dichotomously branched with diffuse branches, often rooting nodes.	Ovate or oblong 2-7 cm long and upto 3 cm wide, obtuse apex, rounded, sessile, cuneate or cordate, short petioled, pubescent on both surfaces.	Fibrous root system often fasciculate at the base and also develop at the nodes	Funnel shaped, auricled on one side pubescent petals are blue, stamen 3, staminodes 2, ovary upto 1 mm long
					where the plant touch the ground	
9.	<i>Cordia myxa</i>	Deciduous, perennial shrub or small tree upto 12m tall may be twisted or straight cm	12m tall, straight or slightly tortuous, greyish brown or smooth bark, branchlets are hairy when young and become glabrous at maturity	Simple, petiolated can be cordate ovate alternate on the branches, leaf blade is typically 3-18 cm long and 3-20 cm wide, apex can be curved or pointed, margins are complete or slightly rough.	Not actually well defined but can be typical tap root.	Unisexual, white or creamy in colour, branched clusters of flowers male flower is bell shaped calyx, 3 lobed corolla tube and 5 oval lobes, female flower have tubular calyx and 4-6 lobed corolla.
10.	<i>Euphorbia hirta</i>	Annual herb, erect or procumbent, 15-50 cm high	Branches often 4- angled, densely clothed with yellow hairs	Opposite, 1-3 cm long and upto 0.6- 1.6 cm wide, obliquely elliptic, acute apex, base usually unequal, hairy, dark green above and pale beneath.	Taproot system having secondary and tertiary root, shows geotropic growth, milky latex comes from fresh roots.	Numerous, less than 1.3 mm long, crowded in small, globose, greenish yellow axillary cymes.

11.	<i>Ficus virens</i>	Deciduous, smooth and greyish bark, upto 35 m tall, strangling in nature.	Large spreading crown, bark is typically smooth greyish may exhibit a rough texture in some varieties	Broad. ovate, shiny dark green, leathery, 10-20 cm in length, distinct side veins are visible below, new leaves are reddish pink in colour	Prominent aerial roots develops from branches and trunk eventually reaching the ground and anchoring the tree	Inconspicuous flowers, develop within fig like syconium (unique structure housing the flowers)
12.	<i>Glinus oppositifolius</i>	Annual, hairless, decumbent or prostrate creeping herb.	Upto 50 cm long and hairless.	Pseudowhorls of 3-6 or opposite, leaf blade spoon shaped or elliptic, base attenuate, margin with sparse teeth, apex acute or obtuse, leaf stalk are short	Having tap root with smaller lateral roots branching of it	Greenish white in colour, perianth segments white or tinged with pink, stamens 35, carpel 3, style 3.
13	<i>Ipomea aquatica</i>	Annual or perennial, sprawling vine, creeping on mud or floating on water	Branched, terete, hollow and succulent allowing them to float	Emerges, glabrous, alternate, petioles succulent when grown in water. 3-20 cm long blade greenish brown, triangular, ovate, lanceolate entire or dentate 3-15 cm long 1-2 cm across, bases	They are not typically taproot but the plants stems readily root at the nodes where	Trumpet shaped, 3-5 cm dia., usually white in colour with purple center, peduncle 5-18 cm long.
				truncate, cordate, sagittate, lobes rounded to acute.	leaves and new stems emerge.	
14.	<i>Oxalis stricta</i>	Small, annual or perennial herb, more or less erect 6-25 cm high.	Pubescent with appressed hairs.	Palmately trifoliate, leaflet 1.2-2.5 cm long, obcordate, base cuneate, petioles 3.5-9 cm long, very slender.	Typically has a tap root and also having secondary and fibrous root, roots can grow upto 6-12 inches deep and spread horizontally.	Small, yellow, 5 petals, oblong rounded radial symmetry typically arranged in a branched clusters of 2 to 7 blossoms on a long slender stalk.

15.	<i>Portulaca oleracea</i>	Small, prostrate annual herb, upto 30 cm.	Glabrous, fleshy with numerous decumbent branches	Spiral or subopposite, often crowded at ends of branches, sessile or subsessile, ovate or spatulate to linear oblong, stipular hairs very few	Taproot and fibrous secondary roots.	Flowers are in groups at the end of the stem. 2 sepals are fused at the base of the ovary may form wing that can cover the fruit, 5-6 yellow petals ranging from 3-10 mm long by 2-8 mm wide with 3-20 stamens, style branches are 36, capsule ranges from 49mm, opening at or just below the middle.
16	<i>Ricinus communis</i>	Perennial flowering plant, shrub, can reach of small tree around 12m.	Typically smooth, round in cross section can be green, red or purple in colour, soft woody, stems and branches have conspicuous nodes	Simple, large, alternate, leaf blades are large typically star like or palmate shape, having 5-11 lobes extending from the central point, dark green or reddish brown with shiny surface, petiolate, venation is prominent	Strong taproot system with prominent lateral roots.	Unisexual, monoecious, yellowish green lacking petals, creamy stem, female flowers located at the tip of spikes, red stigma, found within immature spiny capsules.
17.	<i>Scoparia dulcis</i>	Erect herb or sub shrub, sometimes branched from sub woody base, upto 1 m tall,	Quadrangular, ribbed and often glabrous. Much branched from a main stem.	Opposite, whorled often 3 leaves per node oblanceolate, elliptic lanceolate, obovate. 1. 2 to 4.5cm long and 0.2 to 0.9 cm wide, entire margins, crenate or serrate in upper half glabrous or slightly hairy surface	Taproot system with fibrous secondary roots.	Solitary or paired in axils, slender, filiform, glabrous pedicels, 4 lobed calyx ovate or oblong lobes. 4 petals, white or pale mauve in colour, 4 stamens with pinkish-tinged
				at the nodes, punctate.		filaments and white anthers

18.	<i>Sida rhombifolia</i>	Erect or sprawling subshrub, typically reaching 1 m in height	Erect or prostrate, much branched and can be upto 1m tall, branchlets are covered with stellate hairs.	Alternate, simple and stalked, rhomboid, ovate-elliptic or lanceolate with considerable variation, toothed or serrate margin, covered with stellate hairs on the lower surface.	Deep taproot system with numerous lateral roots. Taproot is twisted and thick while lateral roots are long, thin and wavy.	Solitary or in clusters of 2-5, axillary, yellowish orange in colour with long pedicel.
19.	<i>Solanum nigrum</i>	Annual or short-lived perennial herbaceous plant, can be 1 m tall, prostrate, erect or decumbent growth.	Round, angular, smooth, sparsely hairy, greenish or purple, rigid young stems are pubescent older can become glabrescent with trichome bases persisting as pseudospines.	Alternate, ovate, petiolate, vary in size from 2-8 cm long, dark green in colour can be smooth or slightly hairy, shape can be ovate or lanceolate, base of leaf can be obtuse to truncate, while apex is acute.	Taproot extends vertically downwards, lateral and lignified roots which also have thin branching	Small, white, star shaped in clusters on slender stalk, 5 petals (white or purple fused at base), 5 sepals (small and greenish), 5 stamens (yellow), corolla is stellate.
20.	<i>Tridax procumbens</i>	Prostrate, ascending, perennial herb	Hairy, can reach upto 40 cm long or more.	Opposite, simple, ovate or lanceolate in shape, 2-6 cm long coarsely toothed margins, densely covered in hairs	Strong taproot that extends downwards, also forms adventitious roots at the nodes of its stems.	Solitary, long peduncled, flower heads, cream coloured or white, disc florets are numerous and yellow, involucre bracts (outer protective leaves) are foliaceous (leaf like) and green.

VII. QUANTITATIVE DATA ANALYSIS

Relative Frequency Citation (RFC)

The information of collected wild edible plants was quantitatively analysed using an index of relative frequency citation (RFC) as;

$$RFC = FC/N (0 < RFC < 1)$$

This index shows the local importance of each species and it is given by the frequency of citation (FC, the number of informants mentioning the use of species) divided by the total number of informants participating in the survey (N), without considering the use categories.

Use value (UV)

The Use Value (UV) demonstrates the relative importance of plants known locally. It was calculated by using the following formula

$$UV = \sum U_i / N$$

Where U_i is the number of uses mentioned by each informants for a given species and N is the total number of informants.

VIII.RESULT AND DISCUSSION

A total of 20 plant species belonging to 16 families were recorded with traditional use of different food items and as a herbal medicine against various diseases. The most encountered wild edible plant families were Amaranthaceae(4sps.), Euphorbiaceae(2sps.), Achyrantheaceae (1sps.),Cornaceae(1sps.), Fabaceae(1sps.), Commelineaceae(1sps.), Boraginaceae (1sps.),Moraceae(1sps.), Molluginaceae(1sps.), Convolvulaceae(1sps.), Oxidallaceae(1sps.), Plantagenaceae(1sps.), Malvaceae(1sps.), Solanaceae(1sps.), Portulaceae(1sps.), Astereaceae(1sps.) each.

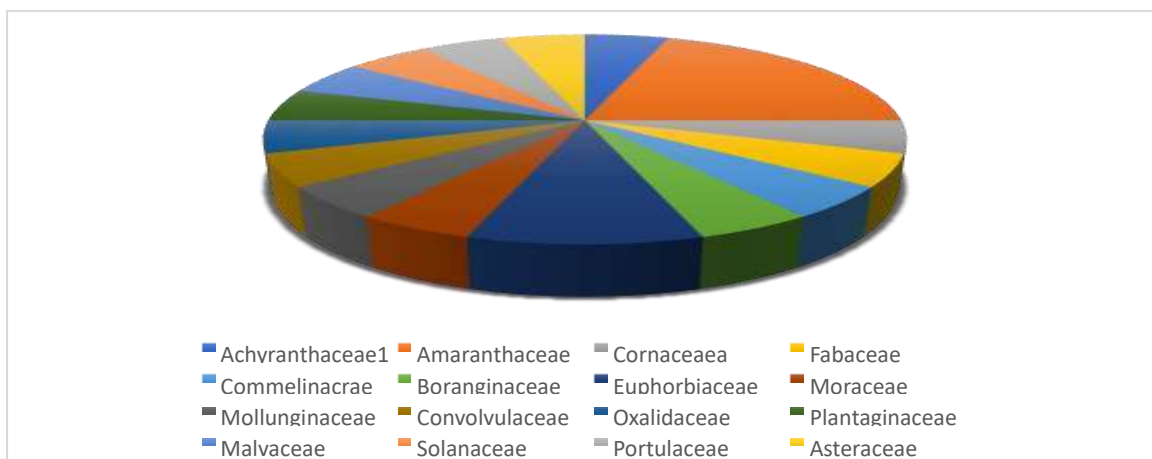


FIG: NUMBER OF FAMILIES REPORTED IN THE STUDY AREA.

Showing % of plant parts used

The parts of the plant primarily used are leaves (23%). Among them around (22%) of the total reported plants that are consumed completely in the form of different food items, Roots(12%), Tender stem(10%), Bark(5%), Seeds(8%), Fruits(10%), Flower(10%).

It was found that the highest number of plant species are used for eating on regular basis in different forms of food items(15 sps.) followed by around (9sps.) for treating fever, cold and cough, hypertension, headache, sore throat, pneumonia, (7sps.) for skin disease, menstrual disorder, (4 sps.) for insect bite scorpion bite, urinary or kidney disorder (2 sps.) for asthma and respiratory and eye problem, stomach disorder, wound healing and others.

The Vaidya's (Traditional healers) and senior citizens of the area diagnose ailments by their signs and symptoms and treat them with naturally growing wild plants without having any specific knowledge of their actual composition and specific laboratory tests, the knowledge run through generations till date.

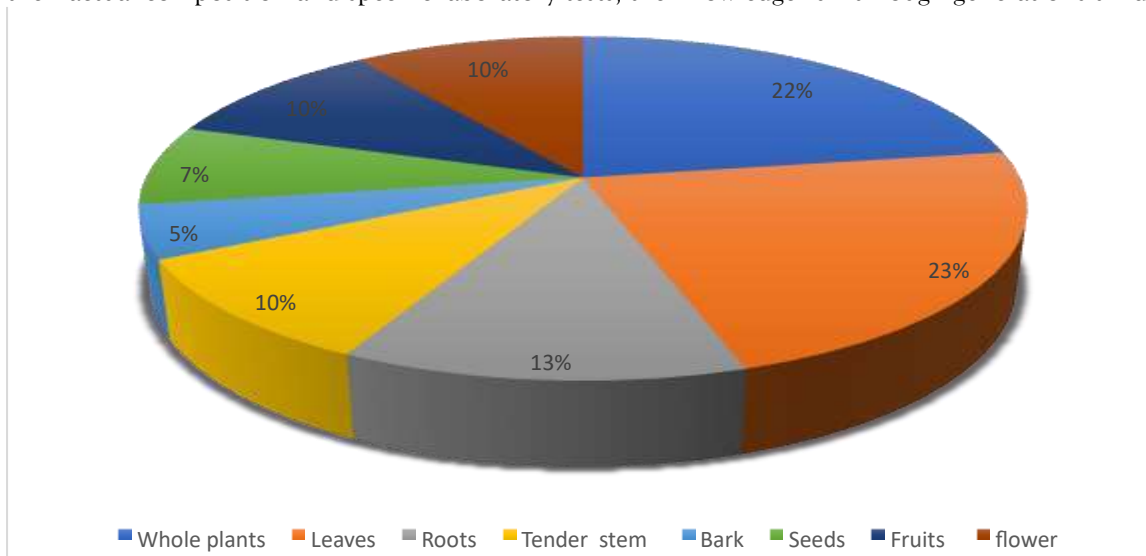


Fig: Showing % of plant parts used

Data on Quantitative Uses of Wild Edible Plants:

Quantitative value indices were calculated in this study to analyse the ethnomedicinal information. There were 6 most cited plants known by a majority of the informants for regular uses and was considered having highest RFC they were *Amaranthus viridis*, *Chenopodium ficillifolium*, *Ficus virens*, *Ipomea aquatica*, *Oxalis stricta*, *Portulaca oleracea* having (93.3%) in RFC followed by *Solanum nigrum* and *Euphorbia hirta* (86.6%), *Alternanthera philoxiroids*, *Commelina benghalensis* (83.3%), *Ricinus communis* (73.3%). These positions correspond to the fact that these plants were reported by highest number of informants mentioning the use of this plants. The value of RFC ranges from 53.3% to 93.3% in the use of this Wild Edible Plants. The former is linked to *Alangium salvifolium* from family Cornaceae while the later is associated with *Amaranthus viridis* from family Amaranthaceae .However the average the Relative Frequency of Citataion (RFC) is 60%.

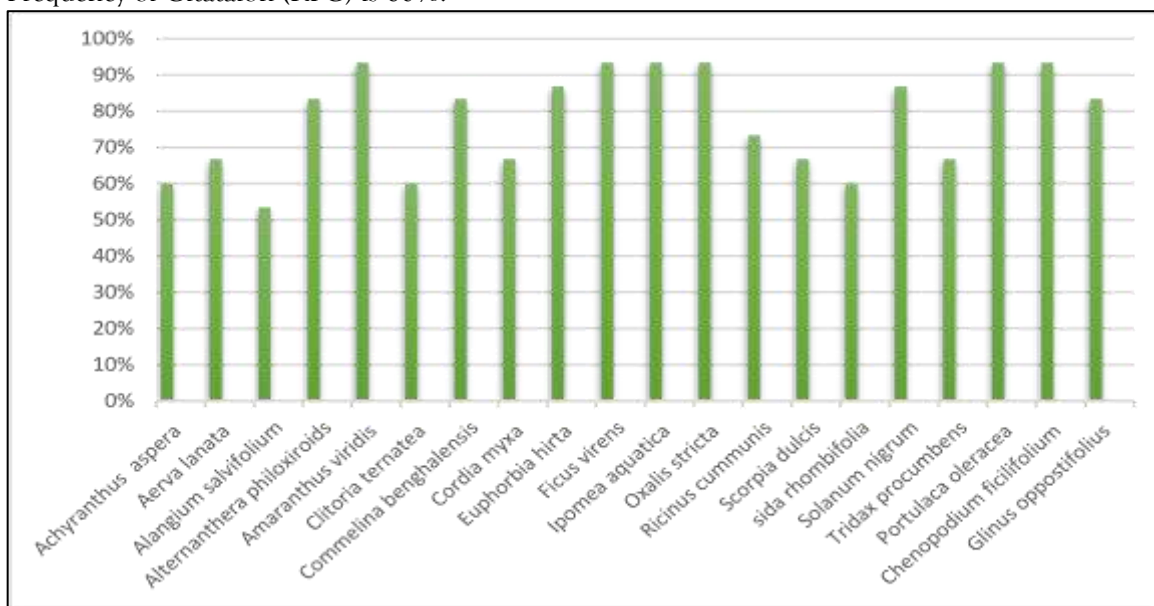


Fig: Showing plant species with highest Relative Frequency of Citation (RFC).

Utility value of different plants:

Shows 7 most popular Wild Edible Plants with highest use value reported by the informants. It shows *Achyranthus aspera*, *Chenopodium ficillifolium*, *Cordia myxa*, *Clitoria ternatea*, *Euphorbia hirta*, *Sida rhombifolia*, *Tridax procumbens* has the highest use value that 5, *amaranthus viridis* having 4.2, *Portulaca oleracea*, *Ricinus communis*, *Solanum nigrum*, *Scorpiadulcis* having 3.75.

The UV of studied plants ranged from 1.6 to 5. The most used value of plant is *Analgium salvifolium* as its used for treating several ailments and the fruits, bark, leaf, roots all parts of the plants are used for some or the other purpose. Some plants like, *Alternanthera philoxiroids* are mainly used for edible purpose and the use value is 3.

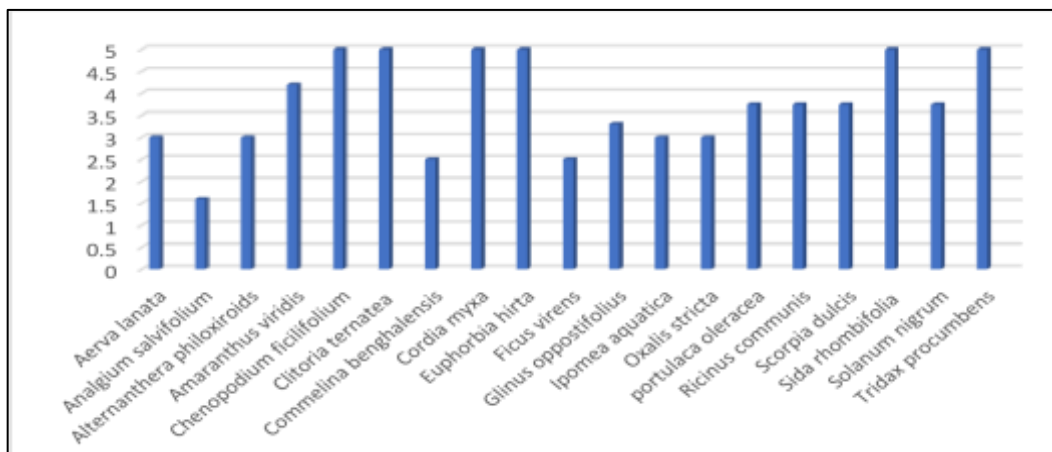


FIG: showing utility value of different plants

IX. CONCLUSION

This study reports the quantitative survey of some wild edible plants in some selected area of Jharia block of Dhanbad District of Jharkhand. Among the 20 plant species belonging to 16 families were reported. The families Amaranthaceae and Euphorbiaceae are the most used families in this area. The leaves are the most favoured part of the plant. The most popular plant of this region as known by local communities include *Amaranthus viridis*, *Chinopodium ficillifolium*, *Ficus virens*, *Oxalis stricta*, *Ipomea aquatica*, *Portulaca Oleracea* based on their highest UV and RFC taken. In this way, we have compiled significant baseline data regarding indigenous knowledge about the traditional use of plants for eating and treating common ailment is now ready to be further investigated phytochemically and pharmacologically which may lead to natural drug discovery and development as the plants in this area are gradually eliminating from this region due to lack of traditional knowledge, continuous mining and anthropogenic activities so preservation of these plants is the need of the hour.

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