

Exploration, Documentation and Ethno-botanical Studies of Wild Edible Plants of Mogarkasa Conservation Reserve (MCR) of Nagpur District, Maharashtra State.

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Abstract: Mogarkasa forest area is a conservation reserve area declared by the State Government on 10/10/2022. The Mogarkasa Conservation reserve area is spread over an area of 103.92 square meters and is rich in biodiversity. Mogarkasa CR is formed from the reserve forest and protected forest area of Mogarkasa Conservation Reserve falls in Paoni Range (Ramtek Taluka) of the Nagpur Forest Division (Territorial and FDCM) and Lendezari and Jamkandri ranges of Bhandra Forest Division. The present study carried out in Mogarkasa CR to study exploration, identification, documentation, ethnobotanical importance and to know the forest food biodiversity with respect to food value of wild edible plants used by the local peoples of fringed villages around Mogarkasa CR. The results revealed that, about 91 wild species are found as WEP's. This study helps to the forest department for preparation of management plan and execution of plan for management of Mogarkasa Conservation Reserve.

Keywords: Mogarkasa Conservation Reserve, Wild edible, Ethnobotany, Nagpur.

I. INTRODUCTION

Maharashtra State Government declared Mogarkasa Conservation Reserve (MCR) by notification dated 10 October 2022. (Notification no. WLP/06.22/CR-172/F-1). Situation, limit and area of Mogarkasa Conservation Reserve (MCR) is in Paoni Range (Ramtek Taluka) of the Nagpur Forest Division (Territorial and FDCM) and Lendezari and Jamkandri ranges of Bhandara Forest Division of Nagpur forest circle having area is 10392.31 Ha. (103.92 sq. km). The hilly area of this conservation reserve is part of Southern Tropical Dry Deciduous Forest; however, patches of Moist Deciduous Forest are also present in the area. The forest is generally well stocked even up to the density of 0.7 and site quality is III and IV. *Dendrocalamus strictus* is the main Bamboo species found around Mogarkasa Lake. Wet land of the Mogarkasa surrounded by the dense forest is very ideal habitat of native and migratory avifauna and also for plants. Geological formation of the proposed area is Deccan trap with basalt rock. Soil resulting from parent rock is black, grey and reddish in color on gentle slope and plateau. Area has fairly wide East- West stretch of banded and foliated crystalline rocks. Manganese bearing rocks are found in the Sausar group. Texture of soil is loamy to sandy loam. Depth of the soil varies from 30 to 75 cms. The area is well drained and falls in the catchments of the Bawanthadi River which is a tributary of the Wainganga River.

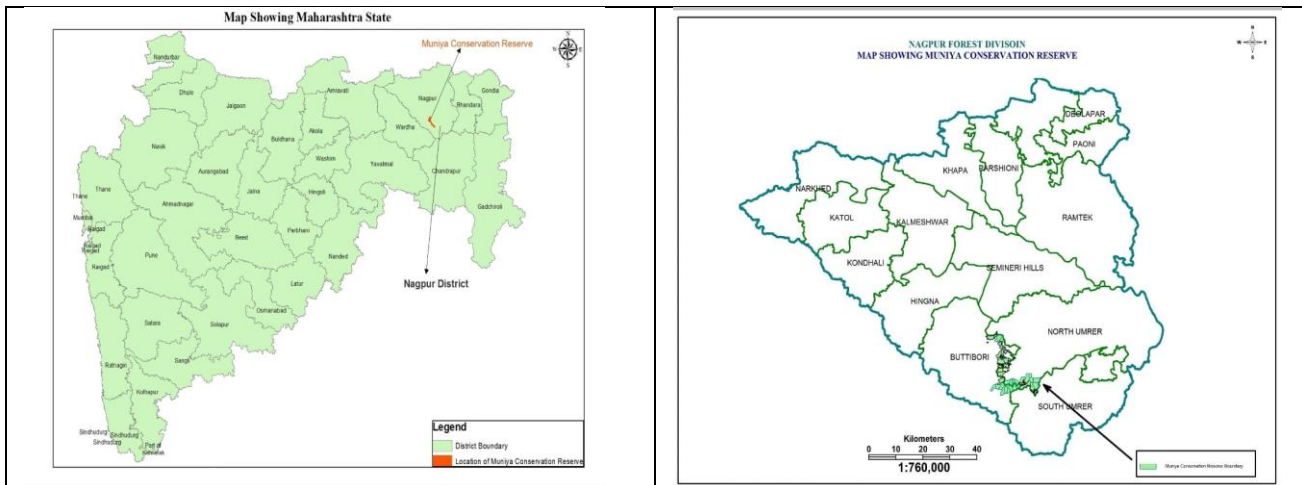
The forests of Nagpur Division belong to the **Sub Group 5A – Southern Tropical Dry Deciduous Forests** as per 'Revised classification of Champion and Seth'. Teak is predominantly found as pure crop in ranges of Nagpur division. Some of the villagers, living nearby the forests, collect various NTFPs such as moha, charoli, gum, honey, roots, bark, leaves etc and sell them locally. Collection of NTFPs constitutes a substantial part of the income of tribal populations and other inhabitants living in and around in the vicinity of the forest areas. (*Working Plan of Nagpur Forest Division, Volume I, Period 2015-16 to 2024-25 by P. Kalyankumar and T.K. Choubey*).

The direct and indirect effects and contribution of the forest derived pharmaceuticals, herbs, fruits, fungi, organic certified products, and other wood and non-wood forest products on human health and well-being, economical and social development, alternative medicine and industry. Their preventive, nutraceutical, therapeutic and healing values and benefits in relation to forest environment also will be addressed. (Kjell Nilsson et al; 2005). Wild edible plants are an essential source of food for the local population (Bhattarai et al., 2010). Wild edible plants provide essential nutrients and are a significant source of food for the local population (Tadesse et al., 2014). Wild edible plants have cultural significance and are used in traditional medicine (Pandey et al., 2017). Enlist 64 wild edible species in Muniya Conservation Reserve and studied ethnobotanical aspects of WEP's.(Chandewar et al., 2023).

II. MATERIAL AND METHOD

A) Study area:

Situation and limits of “Mogarkasa Conservation Reserve” located in Paoni Range (Ramtek Taluka) of the Nagpur Forest Division (Territorial and FDCM) and Lendezari and Jamkandri ranges of Bhandara Forest Division of Nagpur circle and lies between 79.00^0 to 79.15^0 East longitude and 20.40^0 to 21.00^0 North latitude covered with heterogeneous landscape and beautiful forest with some hilly area. For study of wild edible plants covered Paoni forest range of Mogarkasa CR of Nagpur Forest Division.



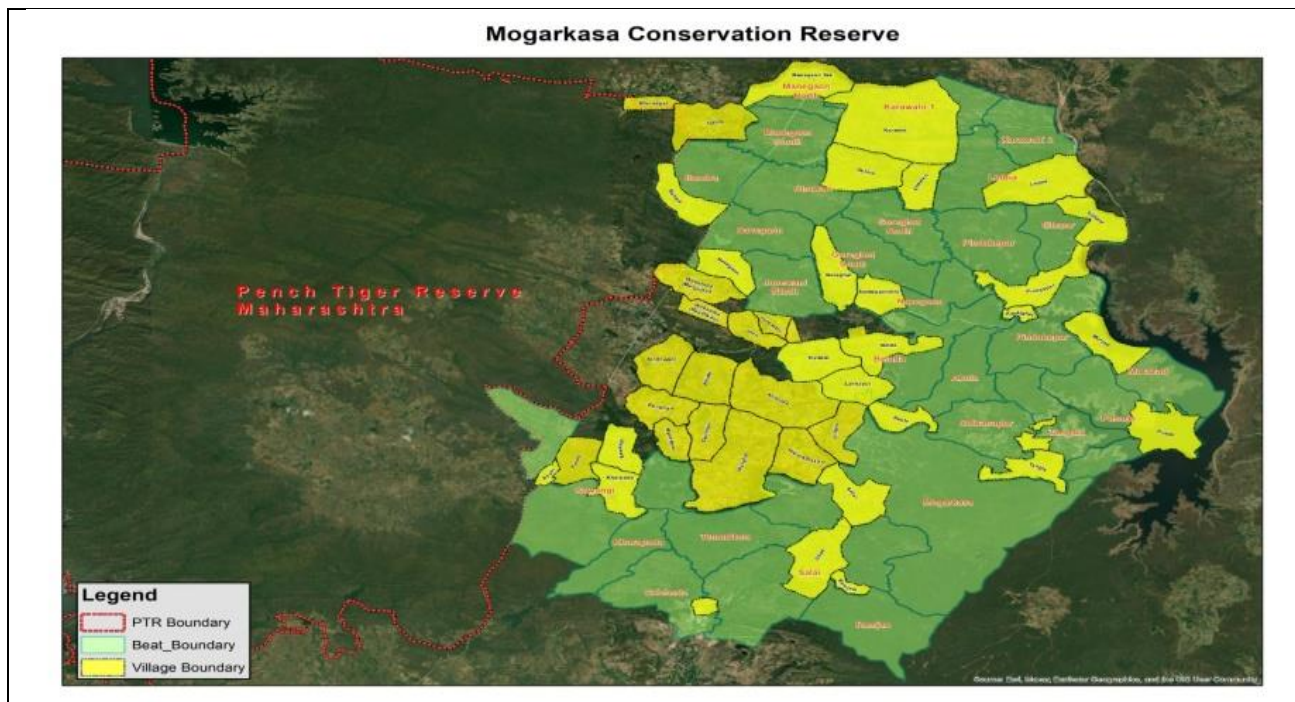


Figure 1: Map showing MCR (study area)

B) Methodology:

For exploration and documentation of wild edible plants of study area i. e. Mogarkasa CR, the ethnobotanical investigations were undertaken in both the ranges of Mogarkasa Conservation Reserve with objectives to study the wild edible plants and to explore and documentation of wild edible plants. Survey of wild edible plants started from rainy season of 2021 and completed in winter season of 2022. The survey of wild edible plants were taken in 16 compartment of Paoni range of Mogarkasa CR and was carried out generally at early morning with the help knowledgeable people in the region, forest labour and forest guard. The survey method adopted according to standard technical method and data was collected using semi-structured questionnaire, interviews and discussions based on the standard procedures suggested by Jain (1989). The detailed information on indigenous knowledge, local name, plant part eaten, various preparation method and medicinal properties was listed and noted down for further confirmation and data analysis. Plants were identified by using different relevant technical books and scientific literature. (Ref.- 4, 8, 9, 22, 23, 24, 25, 29)

C) Observation

The data collected from field was identified, listed out and arranged in a tabulated manner. The wild edible plants reported during the study period have been enumerated and shown in table 3 with their botanical name arranged along with family, local name, parts used, mode of uses, season of availability and market availability.

III. RESULT AND DISCUSSION

The wild edible plants recorded during baseline data collection have been presented in table 3 with their vernacular name, botanical name with family, habit, part used, method of consumption, season of availability and market availability. The recorded 91 plants species, belonging to 49 families. Out of 49 families, 44 families belong to dicotyledons and 5 families belong to monocotyledons.

Out of 91 plants recorded, mode of utilization represented with leaves of 27 plants, fruits of 40 plants, shoots of 3 plants, flower and inflorescence of 6 plants, prickles of 1 plant, corm and rhizomes of 2 plants, bulb of 1

plant, seeds and grain of 10 plants, roots of 2 plants, thalamus of 1 plant, tendrils of 1 plant and petiole of 1 plant species. There are some plant species whose various plant parts used for food.

The findings suggest further investigation on nutritional aspects, medicinal properties, mode of utilization, nursery techniques, harvesting techniques and conservational strategies of the reported wild edible plant species.

Table 1: Plant part used.

Sr. No.	Plant part	No. of species	Percentages
1	Leaves	27	25.65
2	Bulb	1	0.95
3	Flowers	6	5.70
4	Fruits and Berries	40	38.00
5	Grain and Seeds	10	9.50
6	Corns and Rhizomes	2	1.90
7	Prickles	1	0.95
8	Tendrils	1	0.95
9.	Thalamus	1	0.95
10	Shoots	3	2.85
11	Roots	2	1.90
12	Ground Petiole	1	0.95
	Total	95	100

Table 2 : Classification of cotyledon

Sr.No.	Botanical information	Monocotyledon	Dicotyledon	Total
1	Family	5	44	49
2	Species	10	81	91
3	Genus	9	75	84

On the basis of recorded wild edible plant species, the WEP's dominant families of Mogarkasa CR are- Fabaceae, Amaranthaceae, Poaceae, Apocynaceae, Cucurbitaceae. Generic co-efficient of flora of Mogarkasa CR is also good.

3: Observation on wild edible plants found in Mogarkasa Conservation Reserve

S.N.	Vernacular Name (Marathi)	Scientific Name and Family	Habit	Edible Plant Part	Consumption Method	Season of Availability	Availability in Market
1	Ranmung	<i>Vigna trilobata (L.) Verdc.</i> <i>Fabaceae</i>	Herb	Fruit - pod	Pods cooked and consumed	Summer	No
2	Chinch	<i>Tamarandus indica L.</i> <i>Fabaceae</i>	Tree	Fruit	Ripe fruit – table food	Summer	Yes
3	Kala kuda	<i>Wrightia tinctoria R. Br.</i> <i>Apocynaceae</i>	Tree	Flower	Flower cooked and consumed	Summer	No
4	Sitaphal	<i>Annona squamosa L.</i> <i>Annonaceae</i>	Tree	Fruit	Ripe fruit – table food	Winter	Yes
5	Gamer	<i>Gmelia arborea Roxb. Ex Sm.</i> <i>Laminaceae</i>	Tree	Leaves	Tender leaves cooked and consumed	Winter	No
6	Ranmath	<i>Amaranthus viridus L.</i> <i>Amaranthaceae</i>	Herb	Leaves	Leaves cooked and consumed	Winter	No
7	Rajgira	<i>Amaranthus paniculatus L.</i> <i>Amaranthaceae</i>	Herb	Leaves	Leaves cooked and consumed	Winter	No
8	Rantur	<i>Cajanus scarabaeoides (L.)</i> <i>Fabaceae</i>	Herb	Fruit - pod	Pods cooked and consumed	Summer	No
9	Teklabhaji	<i>Ageratum conyzoides L.</i> <i>Asteraceae</i>	Herb	Leaves	Leaves cooked and consumed	Rainy	No
10	Kupi	<i>Acalypha indica L.</i> <i>Euphorbiaceae</i>	Herb	Leaves	Leaves cooked and consumed	Rainy	No
11	Shingada	<i>Trapa natans L. Var.</i> <i>Trapaceae</i>	Herb	Fruit	Raw and boiled fruit eaten	Throughout the year	Yes
12	Deodhan	<i>Oryza rufipogon Griff.</i> <i>Poaceae</i>	Herb	Grains	Grains used as special food	Winter	Yes

13	Kutaki	<i>Panicum miliarenon Lam.</i> <i>Poaceae</i>	Herb	Grain	Grains used as staple food	Winter	Yes
14	Kodu	<i>Paspalum scrobiculatum L.</i> <i>Mant</i> <i>Poaceae</i>	Herb	Grain	Used as scarcity food	Winter	Yes
15	Ghunghana	<i>Crotolaria sericea Retz</i> <i>Fabaceae</i>	Herb	Leaves	Leaves used as vegetable	Rainy	No
16	DhanBhaji	<i>Allmania nodiflora (L.) R.</i> Br. ex Wight <i>Amaranthaceae</i>	Herb	Leaf	Leaves are cooked and consumed.	Rainy	Yes
17	Bamboo Vaaste, bamboo shoots	<i>Bambusa arundinacea (Ritz) willd</i> <i>Poaceae</i>	Culms	Shoot	Cooked and consume/pickle	Rainy	No
18	Widhara, Samudraas hok	<i>Argyrea nervosa (Burm.f)</i> Bojer <i>Convolvulaceae</i>	Climber	Leaf	Fried with required ingredient and consumed as food.	Throught the year	No
19	Kanchan	<i>Bauhinia purpurea L.</i> <i>Caesalpiniaceae</i>	Tree	Seed	Tender pods are cooked as a vegetable.	Rainy	No
20	Surankand	<i>Amorphophalus paeonifolius</i> Dernst <i>Araceae</i>	Herb	Corm	The corm is boiled and then cooked as the vegetable and eaten as food.	Winter	No
21	Khaparfuti	<i>Boerhavia diffusa (L) Hook.</i> <i>Nyctaginaceae</i>	Herb	Leaf	Leaves are cooked as a vegetable	Rainy	No
22	PaturBhaji	<i>Alternathera paronychioides</i> St.HilVoy. <i>Amaranthaceae</i>	Herb	Leaf	Leaves are cooked and consumed	Rainy	Yes
23	Pavur/velbhaji	<i>Bauhinia vahlii Wight & Arm.</i> <i>Caesalpiniaceae</i>	Climber	Seed	Roasted seed and consumed	Summer	No
24	Rui	<i>Calotropis procera (Ait.) R.</i> Br.	Shrub	Fruit	Raw fruits cooked as a vegetable	Winter	No

		Asclepiadaceae					
25	Taad, maad	<i>Borassus flabellifer</i> L. Arecaceae	Tree	Fruit	Fruits –inner part, toddy	Summer Winter	Yes
26	Tarota	<i>Cassia tora</i> Sensu Baker. Caesalpiniaceae	Herb	Leaf	Tender leaves Cooked and consumed.	Rainy	No
27	Kassai	<i>Bridelia retusa</i> (L) Spreng Euphorbiaceae	Tree	Fruit	Ripened fruits are consumed.	Rainy	Yes
28	Pimpalacha cha baar	<i>Celastrus paniculatus</i> Willd. Celastraceae	Climber	Flower	Flowers are cooked as a vegetable	Summer	Yes
29	Charoli, charbiya	<i>Buchanania cochinchinensis</i> (Lour.) Almeida Anacardiaceae	Tree	Fruit	Ripened fruits are eaten. Dried seed cotyledon used in dishes.	Summer	Yes
30	Batwa, baatbhaji	<i>Chenopodium album</i> L. Chenopodiaceae	Herb	Leaf	Leaves are cooked and consumed.	Winter	No
31	Bamboo Vaaste	<i>Dendrocalamus strictus</i> (Roxb) Nees Poaceae	Culms	Shoot	Cooked and consume/pickle	Rainy	No
32	Shelvat	<i>Cordia dichotoma</i> Forst Boraginaceae	Tree	Fruit	Raw fruits used to cook as a vegetable. Used to make as a pickle. Ripened fruits used as a raw eaten.	Summer	No
33	Mataru	<i>Dioscorea bulbifera</i> L.. Dioscoreaceae	Climber	Bulb	Bulb are boiled and consumed.	Rainy and Winter	No
34	Musalbhaji	<i>Chlorophytum borivilianum</i> Liliaceae	Herb	Leaf, Root	Leaves used to make Dalbhaji, Root tubers are eaten raw.	Rainy	No
35	Tembhru	<i>Diospyros melanoxylon</i> Roxb. Ebenaceae	Tree	Fruit	Ripened fruits are eaten.	Summer	Yes
36	Tupkatibhaji	<i>Corchorus capsularis</i> L. Tiliaceae	Herb	Leaf	Young and Tender Leaves are cooked and consumed.	Rainy	No
37	Kakai	<i>Flacourtia indica</i> (Burm. f) Merr.	Tree	Fruit	Ripened fruits are eaten	Summer	No

		Flacourtiaceae					
38	Paatbhaji	<i>Corchorus olerius</i> L.. Tiliaceae	Herb	Leaf	Young and Tender Leaves are cooked and consumed.	Rainy	No
39	Umber	<i>Ficus racemosa</i> Linn. Moraceae	Tree	Fruit	Ripened fruits are eaten	Throught the year	No
40	Kadubhaji	<i>Glinus oppositifolius</i> (L..) A. DC Molluginaceae	Herb	Leaf	Leaves are cooked and consumed.	Rainy	No
41	Wavala, Yensadada	<i>Holoptelea integrifolia</i> (Roxb.) Planch. Ulmaceae	Tree	Seed	Seeds are roasted and then consumed.	Summer	No
42	Phalsa	<i>Grewia asiatica</i> L.. Tiliaceae	Shrub	Fruit	Ripened fruits are eaten	Winter	No
43	Madhumalti	<i>Lantana camara</i> L.. Verbenaceae	Shrub	Fruit	Ripened fruits used as a raw consumed.	Throught the year.	No
44	Mahua	<i>Madhuca longifolia</i> (Koen.) Mac. Bride. Sapotaceae	Tree	Flower, Fruit	Fleshy flower and dried flower used for consumption. Fruits used for recover oil.	Summer	No
45	Lakholi	<i>Lathyrus sativus</i> L.. Fabaceae	Herb	Leaf, Fruit	Tender leaves cooked and consumed. Pods are consumed after roasted.	Winter	No
46	Khirni	<i>Manilkara hexandra</i> (Roxb.) Dub. Sapotaceae	Tree	Fruit	Ripened fruits.	Winter	No
47	Kamal, bhishi	<i>Nilumbo nucifera</i> Gaertn. Nelumbonaceae	Herb	Seed	Seeds roasted and then consumed.	Winter	Yes
48	Bharati	<i>Maytenus senegalensis</i> (Lam.) Excell. Celastraceae	Shrub	Flower	Young flowers and buds are boiled and then cooked.	Winter	No
49	Aaratfari	<i>Olox psittacorum</i> (Willd.)Vahl.	Climber	Leaf	Tender leaves and shoots cooked as a vegetable.	Rainy	Yes

		Olacaceae					
50	Kurta	<i>Macrotyloma uniflorum</i> Fabaceae	Herb	Seed	Seeds used for making dal.	winter	Yes
51	Tattu	<i>Oroxylum indicum</i> (L.) Vent. Bignoniaceae	Tree	Fruit, Flower	Flowers cooked as a vegetable. Fruits used to make pickle.	Rainy	Yes
52	Utaran	<i>Pergularia doemia</i> (Forssk.) Choiv. Asclepiadaceae	Climber	Fruit	Raw fruits cooked as a vegetable.	Winter	No
53	Amboti	<i>Oxalis corniculata</i> L. Oxalidaceae	Herb	Leaf	Leaves are cooked as a vegetable	Throughout the year	No
54	BhuiShindi	<i>Phoenix acaulis</i> Roxb.. Areaceae	Shrub	Underground Petiole	Underground petiole (Finger-length) is scaled and eaten	Throughout the year	No
55	Kusum, Kojaba	<i>Schleichera oleosa</i> (Lour.) Oken. Sapindaceae	Tree	Fruit	Ripened fruits are eaten	Summer	No
56	Kacharkanda	<i>Scripus grossus</i> (L.f) Palla. Cyperaceae	Herb	Root	Rootstocks are boiled and eaten as food.	Winter	Yes
57	Shindi	<i>Phoenix sylvestris</i> (L.) Roxb. Areaceae	Tree	Fruit	Ripened fruits are eaten	Summer	No
58	Biba	<i>Semecarpus anacardium</i> L. f. Anacardiaceae	Tree	Thalamus	Ripened thalamus is eaten.	Winter	No
59	Behada	<i>Terminalia bellirica</i> (Gaertn.) Roxb. Combretaceae	Tree	Seed	Testa is removed and cotyledons are eaten as food.	Throughout the year	No
60	Sherdire	<i>Smilax zeylanica</i> L. Smilacaceae	Climber	Tendrils	Young tendrils and shoots cooked as vegetable.	Rainy	Yes
61	Kochai	<i>Theriophonum dalzellii</i> Schott Araceae	Herb	Leaf	Leaves are used to make Dalbhaji.	Rainy and Winter	No
62	Katwal	<i>Momordica dioica</i> Roxb. Ex. Wild.	Climber	Fruit	Cooked and consumed.	Winter	Yes

		Cucurbitaceae					
63	Surya	<i>Xylia xylocarpa</i> (Roxb.) Taub. Mimosaceae	Tree	Seed	Seeds are roasted and consumed.	Summer	No
64	Mungna	<i>Moringa oleifera</i> Lam. Moringaceae	Tree	Fruit	Pods cooked and consumed.	Throughout the year	Yes
65	Awala	<i>Emblica officinales</i> Gaertn. Phyllanthaceae	Tree	Fruit	Raw fruit used for consumption.	Summer	Yes
66	Kawath	<i>Feronia limonia</i> Linn. Rutaceae	Tree	Fruit	Ripened fruit used for consumption.	Summer	Yes
67	Chichbilai	<i>Pithocellabium dulce</i> (Roxb.) Benth Fabaceae	Tree	Fruit	Ripened fruit used for consumption.	Summer	Yes
68	Jambhul	<i>Syzigium cumini</i> L. Myrtaaceae	Tree	Fruit	Ripened fruit used for consumption.	Rainy	Yes
69	Kapalphodi	<i>Physalis pubescens</i> L. Solanaceae	Shrub	Fruit	Ripened berry used for consumption.	Winter	No
70	Mek , khaja	<i>Cucumis setosus</i> Cogn. Cucurbitaceae	Climber	Fruit	Ripened fruit used for consumption.	Summer	No
71	Mokha	<i>Screbera swietenoides</i> Roxb. Oleaceae	Tree	Leaves	Tender leaves cooked as vegetable.	Summer	No
72	Gholbhaji	<i>Portulaca oleraceae</i> L. Portulacaceae	Herb	Leaves	Leaves are cooked as vegetable.	Winter	No
73	Pathari	<i>Launaea procumbens</i> Roxb. Asteraceae	Herb	Leaves	Leaves are cooked as vegetable.	Winter	No
74	Alu	<i>Colocasia asculenta</i> L. Schott. Araceae	Herb	Leaves	Leaves are cooked as vegetable.	Throughout the year	Yes
75	Kuda	<i>Holarrhena pubescens</i> Wall. Ex. Don Apocynaceae	Tree	Flowers	Flowers cooked as vegetable.	Winter	Yes

76	katesawar	<i>Bombax ceiba L.</i> Malvaceae	Tree	Prickles	Raw prickles consumed.	Through out the year	No
77	Harandodi, haranvel	<i>Wakataka volubilis (L.f.) Stapf</i> Apocynaceae	Climber	Fruit	Fruits cooked and consumed.	Winter	No
78	Keokanda	<i>Costus speciosus(J.Koenig) SM</i> Costaceae	Herb	Rhizome Tender shoots	Tender shoots are eaten as vegetables	Winter	No
79	Jivanti	<i>Leptadenia reticulata Retz. Wight and Arn.</i> Apocynaceae	Climber	Fruit	Fruits cooked and consumed.	Winter	No
80	Bael	<i>Aegle marmelos(L.)</i> Rutaceae	Tree	Fruit	Ripe fruit used for consumption	Summer	Yes
81	Seloti	<i>Cordia myxa L.</i> Boraginaceae	Tree	Fruit	Ripe fruit used for consumption	Summer	No
82	Bahava	<i>Cassia fistula L.</i> Fabaceae	Tree	Fruit	Fruit pulp	Summer	No
83	Aghada	<i>Achyranthes aspera L.</i> Amaranthaceae	Herb	Leaves	Tender leaves cooked and consumed	Winter	No
84	Karwand	<i>Carissa carandas L.</i> Apocynaceae	Shrub	Fruit	Raw fruit used as table food	Summer	Yes
85	Yeroni	<i>Ziziphus oenopolia (L.)Miller</i> Rhamnaceae	Shrub	Fruit	Ripe fruit used for consumption	Summer	No
86	Kena	<i>Commelina benghalensisL.</i> Commelinaceae	Herb	Leaves	Tender leaves cooked and consumed	Winter	No
87	Kateribhen di	<i>Abelmoschus moschatus Medik</i> Malvaceae	Shrub	Fruit	Tender fruit cooked and consumed	Winter	No
88	Ranchavali	<i>Vigna vaxivollata(L.)A.Rich</i>	Climber	Leaves	Leaves cooked and consumed	Winter	No

		<i>Fabaceae</i>					
89	Tondale	<i>Coccinea grandis(L.)Voigt.</i> <i>Cucurbataceae</i>	Climber	Fruit	Fruits cooked and consumed	Winter	Yes
90	Ranudid	<i>Teramnus volubilisSw</i> <i>Fabaceae</i>	Herb	Fruit – pod	Pods cooked and consumed	Summer	No
91	Dangru	<i>Cucurbita maxima Duch.</i> <i>Cucurbitaceae</i>	Climber	Fruit	Raw fruit used as table food	Winter	Yes

Fig.2- Plant parts used by locals of recorded plant species.

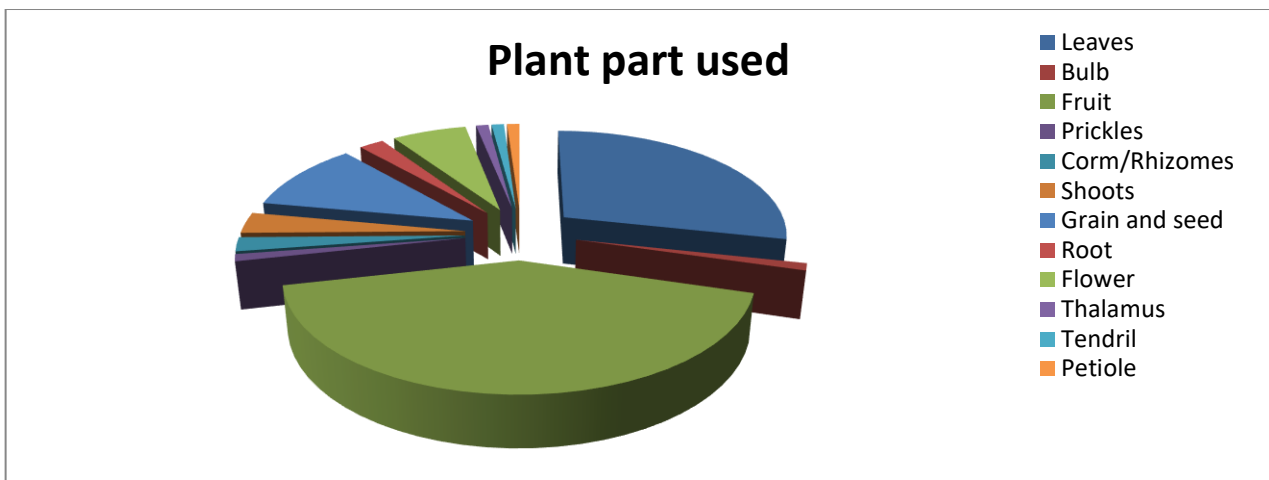


Fig. 3- Habit of plants recorded in Mogarkasa CR

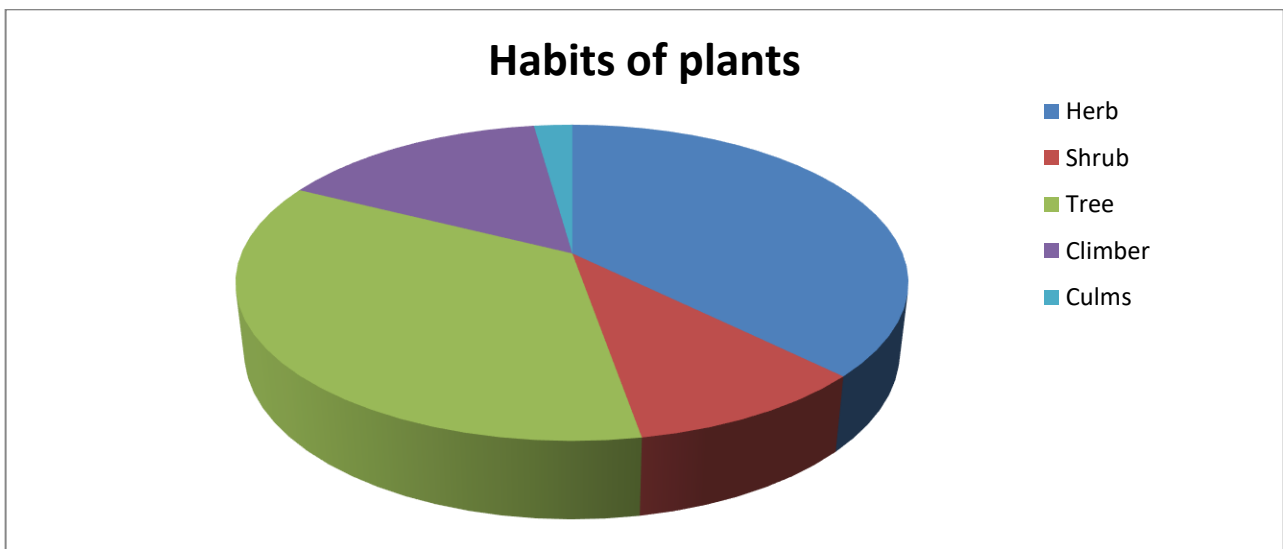


Figure 4:- Photos of some of the collected wild edibles from Mogarkasa CR.



IV. CONCLUSION

The ethnic and local people use different wild edible plants which are available in their vicinity of various geographical region of the world (Monoranjan Chowdhary et al; 2012). Mogarkasa Conservation Reserve having excellent biodiversity in wild edible plant. This is the first of its kind of attempt in the study area as the area declared as conservation reserve by the state government. The study highlights the rich biodiversity of the sanctuary and the vital role of traditional knowledge in the conservation and sustainable utilization of natural resources. The present study helps to the forest department for preparation of management plan and execution of plan for management of conservation reserve. This study also used as a raw data for the creation of cottage industry for the people of fringed villages of Mogarkasa CR.

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