DOI:10.26524/KRJ297

Kong. Res. J. 6(2): 20-27, 2019
Publisher: Kongunadu Arts and Science College, Coimbatore.

RESEARCH ARTICLE

SURVEY OF WILD EDIBLE PLANTS OF DHANAKARKULAM PANCHAYATH, TIRUNELVELI DISTRICT, TAMIL NADU, INDIA

Kohila, A. and V. Mary Kensa*
Department of Botany and Research Centre, S.T. Hindu College, Nagercoil – 629002, Kanyakumari District, M.S University, Abishekapatti, Tirunelveli,Tamil Nadu. India.

ABSTRACT

The present study was carried out in the Dhanakarkulam panchayath to document the diversity, indigenous uses and availability status of wild edible plants. The inhabitants of the region are dependent up to a large extent on wild resources for their food and other daily needs.. The study revealed a total of 51 species, 42 genera and 27 families of wild edible plants were recorded in the study area. The total number of plant species recorded as medicinal and wild food plants indicated that the study area has substantial amount of useful plants and diverse source of medicinal and wild food plants. The diversity of these medicinal and wild edible of these medicinal and wild edible plants might be due to the suitability of environmental condition for different types of plant species. This finding is a good indicator for the presence of a considerable diversity of plant species is the study area. The study will be helpful in developing a comprehensive data base on wild plant resources, strengthening the food security in area and in conserving the traditional knowledge for the prosperity of the remote areas.

Keywords: availability, comprehensive, diversity, substantial and remote areas.

1. INTRODUCTION

Edible Wild Plants (EWPs) play an importance role in household livehoods, especially during periods of both natural and manmade stresses. They have significant nutritional economic ecological and socio-cultural values (1,2). EWPs are marketable and provide the opportunity to supplement hold income. People in different parts of the world depend on plant resources for their basic needs for food, clothes and shelter occurring in their environment (3). Wild edible plants (WED) provide stable food for indigenous people, serve as complementary food for non-indigenous people and offer an alternative source of cash income for poor communities (4). Wild edible plants have played an important role in human life since time immemorial. In India, most rural inhabitants depend on the wild plants to meet their supplementary food requirements. Keeping this in view, the present study was conducted as an attempt from the region to explore and identify the wild edible plant resources and indigenous knowledge about their utilization.

The study areas was in Thirunelveli District situated in the southern tip of peninscular India is under strategic location and has rich diversity of plants scattered over the hills and hillocks of the district. However, published data on survey of wild edible plants of Dhanakarkulam panchayath, Thirunelveli district, Tamilnadu are meagre. Reports on the survey of wild edible plants of Dhanakarkulam panchayath, Thirunelveli district, Tamilnadu is very scanty. Hence, the present study was undertaken to survey of wild edible plants of Dhanakarkulam panchayath, Thirunelveli District.

2. METHODOLOGY

Extensive field surveys were made in the study area from December 2018 to February 2019 in different seasons i.e., rainy, winter and summer, to collect the wild edible plants and their indigenous uses. The information on wild plants was collected by interviewing local inhabitants. The informants were men and women working in the fields, priests, medicine-men and birth attendant above the age of 50 years. To determine the authenticity of information collected during field work, repeated verification of data from different informants was done. Thus, only the specific and reliable information cross-checked with informants has been incorporated in the present study. The specimens were identified with the help of existing literature (5,6). The availability status of plants such as abundant, common and uncommon was given based on their occurrence in the study area. I did not collect voucher specimen in cases where field identification of species was certain. In the other cases, field notes and photographs were taken. The specimens were identified with the help of reference collections and expert knowledge.

*Correspondence: Mary Kensa V., Department of Botany and Research Centre, S.T. Hindu College, Nagercoil – 629002, Kanyakumari District, M.S University, Abishekapatti, Tirunelveli,Tamil Nadu. India. E.mail: surejkensa@gmail.com

3. RESULTS AND DISCUSSION

A total of 51 species, 30 genera and 27 families of wild edible plants were recorded in the study area (Table 1). The total number of plant species recorded as medicinal and wild food plants indicated that the study area has substantial amount of useful plants and diverse source of medicinal and wild food plants. The diversity of these medicinal and wild edible of these medicinal and wild edible plants might be due to the suitability of environmental condition for different types of plant species. This finding is a good indicator for the presence of a considerable diversity of plant species in the study area.

The families like Cucurbitaceae (6), Amaranthaceae and Solanaccae contains 5 species, followed by Fabaceae (4), Rutaceae (3), Poaceae (2), Lythraceae (1), Zinginberaceae (2), Arecaceae (2), Phyllanthaceae (2) and Musaceae, Myrtaceae, Sapotaceae, Caricaceae, Moringaceae, Caesalpiniaceae, Vitaceae, Combretaceae, Moraceae, Anonaceae, Talinaceae, Brassicaceae, Liliaceae with single plant species. Similar finding was observed by Getnechokole (7) indicated that Fabaceae accounted the largest species in their study. Among 51 collected plant species, about 12 plant species were used for only medicinal purposes whereas about 39 of plant species are used for only edible food and about 51 plant species were used for both medicinal and food purpose (Table 1).

Fig. 1. Habit wise distribution of plant species in the study area

Number of wild tree species are more 20, followed by herbs 20, shrub 3 and climber8 as is graphically as well as tabulated in Fig. 1. This results also concuss with the work of Teklehaymanot and Giday (8) 2010 and Zemede and Mesin (9). Flowering in most of the enumerated plants start between January and March but fruiting period varies from species to species. Fruits are mostly consumed raw and leafy vegetables are cooked, boiled or fried.

Similarly, Assegid and Tesfaye (10) reported that the collected wild edible plants, trees comprised 18 species, and the remaining 12 species were shrubs. Tilahun and Mirutse (11) also reported that study of wild edible plants in Kara and Kwego agree with this results. However, disagree with the report from Derashe and Kucha district which revealed that wild edible materials are largely collected from shrubs. These differences might be due to environmental differences.

The present study, indicated that in 51 plant species, the fruit part is used by many (28) leaves (2), stem (3), root (1), rhizome (1), seed (6), stem / leaf (6), fruit / seed (3) and flower / fruit (1) respectively (Fig. 4). These results revealed with Assegid and Tesfaye (29), that reported as 80% of consumed edible parts are fruits. The dominance of fruits are edible parts has also been reported in most previous studies that undertaken in Ethiopia (9,10). Roots are most used parts for medicinal and edible purposes. This variation might be due to the variation of plant species is adapting to different ecological zone and culture of the people in different area.

12 species of medicinal plants belonging to Malvaceae, Liliaceae, Sapindaceae, Caricaceae families were identified from the study area (Table 1). Most of the species are reported from Cucurbitaceae family. This indicated that, medicinal plants are more in number as compare to edible plants. The local people had in depth indigenous knowledge on uses of plant remedies for treatment of human diseases and livestock ailments from natural vegetation.

These medicinal plants are used to treat about dysentery, skin disease and eye infection types of human ailments and wounds of mouth and constipation types of livestock ailments. Most of them, about *Alternanthera sesselis* plant species are used to treat fever followed by *Amaranthus spinosus* plant species used to treat internal bleeding and excessive mensuration respectively (Table 2).

The relative high number of edible plants in the study area may be due to the more intensive utilization of plant by the local communities and diverse agroecology. As regards the mode of consumption 16 are consumed raw, 18 boiled, 4 in juice form, 10 either raw/boiled 3 as decoction (Fig. 6).

The present study indicates that the area harbors a high diversity of wild edible plants. Out of 51 plant species, 21 were abundant, 26 common and

4 uncommon to this area. The uncommon plant species to this area are being threatened due to unplanned exploitation. The inhabitants revealed rich presence of many of these species in the area in the past, which has restricted now, to certain patches. If immediate steps for their sustainable utilization and conservation are not taken, these species may reach to the status of threatened in the area.

During this research work, it was found that for most of the herbaceous species, the edible parts were not even sold in local markets. This was due to decline in traditional knowledge, limited availability or availability only in a particular season. Scrutiny of literature revealed that much work have been done to document medicinal uses of plants, but scanty and sporadic researches have been carried out to document the edible wild herbaceous plant species in the tribal inhabited regions of state Jharkhand (12,13).

The study revealed, angiosperms were represented by 27 families comprising of 3.92% of monocotyledons and 96.07% of dicots (Fig. 2). Among the wild edible plants, 14 were obtained from the wild, and 11 of the wild edible plants were obtained both from the wild and home garden while 26 of the wild edible plants were obtained from the home garden (Fig. 3).

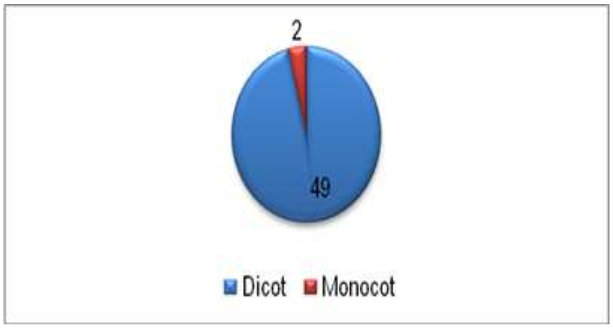

Fig. 2. Cotyledon wise distribution of identified plants

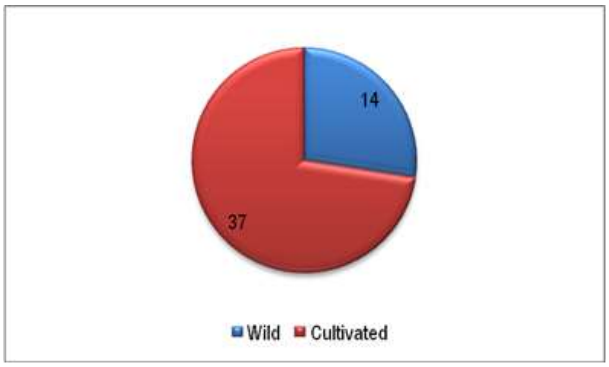

Fig. 3. Distribution of nature of plant

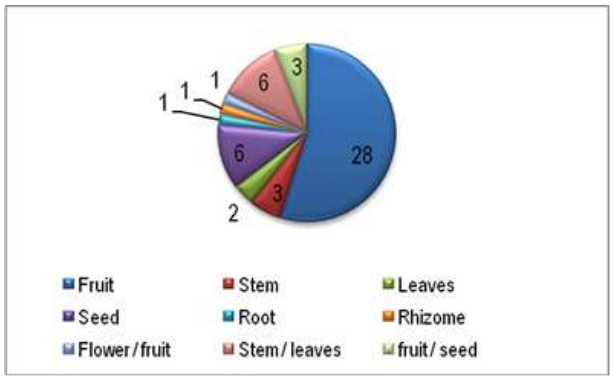

Fig. 4. Parts used from the identified plants

The parts consumed included fruits, seed, stem, leaf, fruits were the dominant edible parts followed by leaves consumed by the people in the study area. The dominance of fruits as edible parts has also been reported in most previous studies (9,14), contrary to this findings. Ali--shtayeh *et al.,* (15) reported leaves and stems as the most widely used parts of wild edible trees and shrubs in the West Bank of Palestine, this difference might be due to variation in the available species and culture of the communities with respect to food preference and preparation.

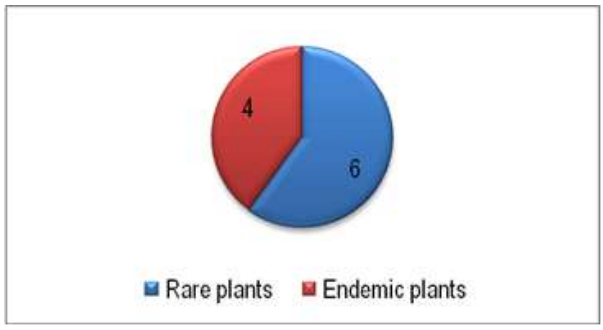

Fig. 5. Identified rare and endemic plants in the study area

The majority of wild edible plants were rare in the study area (Fig. 5), this could be attributed to anthropogenic and natural factors in the study area. Their availability in the study area was also influenced by seasonal variation most of them are scarce during the dry season. Balemie and Kebebew, (176) also reported that the availability of wild edible plants varies depending on ecological and climatic conditions. Wondimu *et al*., (17) reported that the majority of wild edible plants are rare in

their respective study area due to continued destruction of their habitats and over harvesting. Most of the wild edible plants collected during the study period were accessible. They can easily be available on market. Sources are rarely available on market. This could be attributed to season and increase distance to harvest areas. Some examples of commonly available wild edible plants in the study area were *Oryza sativa*, *Amaranthus viridis*, *Amaranthus spinosus*, *Alternanthera ficoidea*, *Cissus quadrangularis,* and *Solanum lycopersicum* (Table 1).

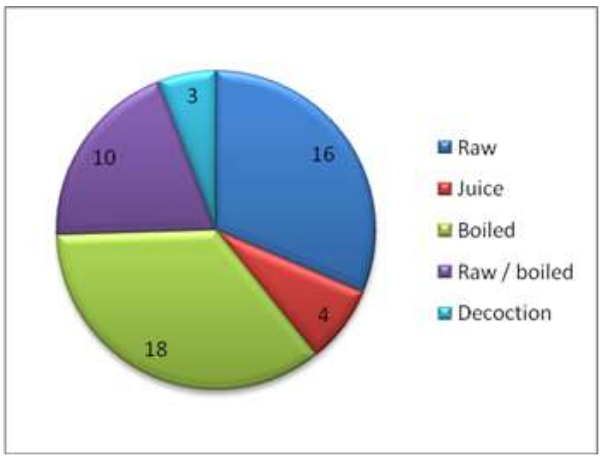

Fig. 6. Mode of utilization of wild edible plants in a selected study area

Among all the edible plants, 4 endemic species were recorded (*Pithecellobium dulce, Brassica nigra, Phyllanthus acidus* and *Talinum fruticosum*). The presence of endemic species illustrates the fact that the informants have a deep knowledge of their environment, since the four of them are not very abundant and can be found only in certain areas with one species. Most of wild species are gathered from waste and uncultivated land or from shrub land and in the roadsides.

Modern crop production of any region is based on only a few plant species. However, many less-recognized plant species continue to be grown, managed, or collected particularly in the rural areas of developing economics. Thus, these less – recognized plant contribute to the live hood soft poor and to the agricultural bio-diversity. Some of the species called underutilized plant species are characterized by the fact that they are locally rare. Their current use is limited relative to their economic potential. Most of the underutilized plant species can benefit from marketing development as a means to support their sustained use and help forester the conservation of agro biodiversity, while generating sustainable income for the native people.

The Mediterranean area shows that the majority of the EWPs used for human consumption belong to the Asteraceae family as they are considered to be particularly appetizing and above all widely – known (18-20). As other studies (21) have also shown, the data demonstrate that collecting and consuming EWPs still is an important local activity. Moreover, many species are also known and collected for their medicinal properties (e.g. 22; 23). In central Italy in particular ethnobotanical knowledge is very much alive (24), while nutraceutical properties have been studied extensively (25,26). With reference to the informants there was a greater number of women, who provided more details than the male informants, probably because collecting and cooking in wild plants is almost exclusively a female occupation and it is them who possess the greatest knowledge of EWPs, in agreement with other studies (18,25).

Table 1. Survey of wild edible plants in the selected study area

S. No.	Name of the plant	Family	Local name	Medicinal uses
1	*Abelmoschus esculentus* (L.) Moench	Malvaceae	Lady's finger	Increase the memory power
2	*Achras sapota* L.	Sapotaceae	Sapota	Treatment of fever, hemorrhage, wounds, ulcers, diarrhea and indigestion
3	*Allium cepa* L.	Liliaceae	Onion	It helps build a better and stronger immunity and control diabetes
4	*Alternanthera ficoidea* (L.) sm.	Amaranthaceae	Ponnanganni	Antiviral agent

S. No.	Name of the plant	Family	Local name	Medicinal uses
5	*Alternanthera sessilis* (L.)R.Br.ex Dc.	Amaranthaceae	Koduppai keerai	Cure fever, diarrhea and dysentry
6	*Amaranthus caudatus* L.	Amaranthaceae	Sigappu thandu keerai	Cure the diuretic
7	*Amaranthus spinosus* L.	Amaranthaceae	Araikeerai	Treatment of internal bleeding, diarrhea and excessive menstruation
8	*Amaranthus viridis* L.	Amaranthaceae	Kuppai keerai	Cure dysentery, purgative and eye infection
9	*Anacardium occidentale* L.	Anacardiaceae	Kollampazham	Cure malaria and reduce blood sugar levels
10	*Annona squamosa*L.	Anonaceae	Seethapazham	Cure fever, diarrohea, skin disease and asthma
11	*Arachis hypogaea* L.	Fabaceae	Groundnut	Cure the inflammatory and rheumatism
12	*Atrocarpus heterophyllus* Lam.	Moraceae	Jack fruit	Ulcer disease
13	*Brassica nigra* L.	Brassicaceae	Black mustard	Relief from rheumatism
14	*Borassus flabellifer*L.	Arecaceae	Panankai	Anti-inflammatory and antioxidant property
15	*Capsicum annuum* L.	Solanaceae	Chilli	Cure the back pain, allergic rhinitis (hay fever), burning mouth syndrome
16	*Cardiospermum helicacabum* L.	Sapindaceae	Mudakathan	Rheumatism
17	*Carica papaya* L.	Caricaceae	Papaya	Skin disease
18	*Cissus quadrangularis* L.	Vitaceae	Pirandai	Regularize menstruation
19	*Citrus limon* (L.) Osbeck	Rutaceae	Lemon	Cure the scurvy
20	*Citrus medica* L.	Rutaceae	Narthangai	Treatment of asthma, arthritis, headache and stomach ache
21	*Coccinia indica* Wight & Arn.	Cucurbitaceae	Covakai	Treatment of antidiabetic patient
22	*Cocos nucifera* L.	Arecaceae	Coconut	Bad odour of mouth, decrease the stone of urinary system
23	*Cucumis sativus* L.	Cucurbitaceae	Cucumber	Soft skin disease increase the water level in a body
24	*Cucurbita pepo* L.	Cucurbitaceae	Pumpkin	Remedy for internal parasites and purgative disorder
25	*Curcuma longa* L.	Zingiberaceae	Turmeric	Cure the skin disease
26	*Lagenaria siceraria* (Mol.) standley	Cucurbitaceae	Suraikai	Treat the purgative, ulcer, stomach acidity
27	*Mangifera indica* L.	Anacardiaceae	Mango	Asthma, diabetes
28	*Manihot esculanta* crantz	Euphorbiaceae	Maravallikizhangu	Cure indigestion, diarrhoea and dysentery

S. No.	Name of the plant	Family	Local name	Medicinal uses
29	*Momordica charantia* L.	Cucurbitaceae	Bitter guard	Antidiabetic, anticancer and antiinflammation
30	*Moringa oleifera* Lam.	Moringaceae	Moringa	Used to antitumor, antipyretic antiulcer, antioxidant
31	*Murraya koenigii* (L.) Sprenge	Rutaceae	Curry leaf	Eye vision, increase hair growth
32	*Musaparadisiaca* L.	Musaceae	Banana	It stimulate the production of hemoglobin in the blood
33	*Oryza sativa* L.	Poaceae	Rice	Dysentery, energy level of the body
34	*Phyllanthus acidus* (L.) skeels	Phyllanthaceae	Gooseberry	Cure skin disease and relief from itching
35	*Phyllanthus emblica* L.	Phyllanthaceae	Gooseberry	Treatment of diarrhea, jaundice and inflammation
36	*Pithecellobium dulce* (Roxb.) Benth	Fabaceae	Kodukapuli	Treat the gum ailments and toothache and bleeding
37	*Psidium guajava* L.	Myrtaceae	Guava	Maintain sugar level, eye vision problem, boost of immunity system
38	*Punica granatum* L.	Lythraceae	Pomegranate	Cure fever and maintain the blood circulation level
39	*Ricinus communis* L.	Euphorbiaceae	Castorbeen	Skin disease
40	*Saccharum officinarum* L.	Poaceae	Sugarcane	Treat to sore throat
41	*Sesbania grandiflora* (L.) Poiret	Fabaceae	Agathi keerai	Treatment of swellings, rheumatism
42	*Solanum lycopersicum* L.	Solanaceae	Tomato	Used to treatment of cancer, high chloestrol, depression, improve vision
43	*Solanum melongena* L.	Solanaceae	Brinjal	Treated with the analgesic, antiasthematic
44	*Solanum nigrum* L.	Solanaceae	Manathakali	Cure skin disease and mouth wounds
45	*Solanum torvum* sw.	Solanaceae	Sundakai	Treat fevers, coughs, asthma and sore throat
46	*Talinum fruticosum* (L.) Juss	Talinaceae	Paruppu keerai	Treatment of diabetes
47	*Tamarindus indica* L.	Caesalpiniaceae	Tamarind	Cure skin disease
48	*Terminalia catappa* L.	Combretaceae	Almond	Treat the jaundice and dysentery
49	*Trichosanthes cucumerina* L.	Cucurbitaceae	Snake guard	Treat the emetic purgative
50	*Vigna mungo* (L.) Hepper	Fabaceae	Black gram	Supportive, cooling and astringent properties
51	*Zingiber officinale* Roscoe	Zingiberaceae	Ginger	Digestion, stomach problem, regulate the

S. No.	Name of the plant	Family	Local name	Medicinal uses
				mensuration

Table 2. Identified rare and endemic plants in the study area

S. No.	Rare plants (6)	Endemic plants (4)
1	❖ *Cardiospermum helicacabum* L. ❖ *Curcuma longa* L. ❖ *Phyllanthus emblica* L. ❖ *Terminalia catappa* L. ❖ *Vigna mungo* (L.) Hepper ❖ *Zingiber officinale* Rose	❖ *Brassica nigra* L. ❖ *Phyllanthus acidus* (L.) Skeels. ❖ *Pithecelloblum dulce* (Roxb) Benth ❖ *Talinum fruiticosum* (L.) Juss

Conclusion

The study revealed that all household members of the study area were involved in the collection and consumption of wild edible plant species. This helps to ensure the maintenance of indigenous knowledge associated with wild edible plant species. The local knowledge about the nutritional composition and side effects of the wild edible plant species is very scanty and little is known about undesirable side effects such as toxicity originating from the wild edible plants. Apart from their food and medicinal value most of the identified wild edible plant species in the study area are used by the community for other different purpose. Thus this has led to a high level of threats of the wild edible plant species in the study area. In addition, many of the wild edible plants found in the study area are found to be under growing pressure, due to anthropogenic and socio economic factors. This has resulted in the dwindling of the species of wild edible plants and the associated indigenous knowledge.

REFERENCES

1. Guijt, I., F. Hinchcliffe and M. Melnyk, (1995). The hidden harvest: the value of wild resources in agricultural systems. A project summary, *International Institute for Environment and Development*, London.
2. Wilson, K.B. (1990). Ecological dynamics and human welfare: A case study of population, health and nutrition in southern Zimbabwe. University College, London.
3. Balick, M.J., and A. Cox, (1996). Plants, People and culture. The science of Ethnobotany. New York: Scientific America.
4. Ju, Y., J. Zhuo, B. Liu, and C. Long (2013). Eating from the wild: diversity of wild edible plants used by Tibetans in Shangri – laregion, Yunnan, China. *J. Ethnobiol. Ethnomed*. **9**: 28.
5. Gamble, J.S., and C.E. Fischer, (1915-1936). Flora of presidency of Madras, Vols. 1-3 Adlard and sons Ltd., London.
6. Hooker, J.D. (1872-1897) .The flora of British India. Reeve & Co. Ltd., London.
7. Getnechokole, (2011). An ethnobotanical study of plants used in traditional medicine and as wild foods in and Tara Gedam and Amba Remnant forests in Libokemkem Wereda, South Gonder Zone, Amhara Region Ethiopia (published thesis)
8. Teklehaymanot, T., and M. Giday, (2010). Ethnobotanical study of wild edible plants of Kara and Kwego semi-pastoralist people in lower Omo River Valley, Debub Omo Zone, SNNPR Ethiopia. *J. Ethnobiol Ethnormed*. **6**: 23.
9. Asfaw, Z., and M. Tadesse, (2001). Prosepects for sustainable use and development of wild food plants in Ethiopia. *Econ. Bot.* **55**: 47-62.
10. Assefa, A., and Tesfaye, (2011). Wild edible trees and shrubs in the semi arid low lands of Southern Ethiopia, Southern Agricultural Research Institute, Hawassa. *Ethiop. J. Sci. Develop.* **1**: 1-15.
11. Tilahun, T., and M. Giday, (2010). Ethnobotanical study of wild edible plants of Kara and Kewegosemipastoralist people in lower Omo River valley, Debubomo Zone, SNNPr, Ethiopia. *J. Ethnobiol. Ethnomed.*
12. Singh, G., and J. Kumar, (2012). Traditional knowledge on some less known wild edible plants used among Munda tribe of Jharkhand. *The Ecoscan* **3&4**: 153-155.

13. Singh, G., and J. Kumar, (2015). Diversity of wild edible yams and its traditional knowledge among Munda tribe of district Khunti, Jharkahand, India. *Int. J. Bioassays* **4**(10): 4440-4442.
14. Addis, G., K. Urga, and D. Dikasso, (2005). Ethnobotanical study of edible wild plants in some selected districts of Ethiopia. *Hum. Ecol.* **3**(1): 83-118.
15. Ali-shtayeh, M.S., R.M. Jamous, J.H. Al-Shafie, W.A., F.A. Elgharabah Kherfan, K.H. Qarariah, I.S., Khdair, *et al.,* (2008). Traditional knowledge of wild edible plants used in Palestine : a comparative study. *J. Ethnobiol. Ethnomed*. **4**: 13.
16. Balmie, K., and Kebebew, F. (2006). Ethnobotanical study of wild edible plants in Derasha and Kucha Districts, South Ethiopia. *J. Ethnobiol. Ethnomed*, 2: 53.
17. Wondimu, T., Z. Asfaw and E. Kelbessa, (2006). Ethnobotanical study of food plants around 'Dheeraa' Town, Arsi, Ethiopia, SINET: *Ethiop. J. Sci*. **29**(1): 71-80.
18. Forbes, M.H.C. (1976). Gathering in the Argolid: a subsistence subsystem in a Greek agricultural community. *Ann. Ny. Acad. Sci*., 251-264.
19. Della, A., D. Paraskeva Hadjichambi and A.C. Hadjichambis, (2006). An ethnobotanical survey of wild edible plants of paphos and Larnaca country side of Cyprus. *J. Ethnobiol. Ethnomed*. **2**: 34
20. Dogan, Y. (2012). Traditionally used wild edible greens in the Aegean Region of Turkey, *Acta. Soc. Bot. Pol*. **81**(4): 245-255.
21. Ghirardini, M.P, M. Carli, N. Del vecchio, A. Rovati, Cova and F. Valigi, (2007). The importance of a taste a comparative study on wild food plant consumption in twenty one local communities in Italy. *J. Ethnobiol. Ethnomed*. **3**: 22.
22. Guarrera, P.M., G. Forti and S. Marignoli, (2005). Ethnobotanical and ethnomedicinal uses of plants in the district of Acquapendente (Latium, Central Italy). *J. Ethnopharmacol*. **96**(3): 429-444.
23. Passalacqua, N.G., P.M. Guarrera and G. De Fine, (2007). Contribution to the knowledge of the folk plant medicine in Calabria region (Southern Italy). *Fitoterapia* **78**(1): 52-68.
24. Gurrera, P.M., and M.L. Leporatti, (2007). Ethnobotanical remarks on central and Southern Italy. *J. Ethnobiol. Ethnomed*. **3**: 23.
25. Ranfa, A., A. Maurizi, B. Romano and M. Bodesmo, (2014). The importance of traditional uses and nutraceutical aspects of some edible wild plants in human nutrition: the case of Umbria (Centrla Italy). *Plant Biosyst.* **148**(2): 297-306.
26. Maurizi, A, A. De Michele, A. Ranfa, A. Ricci, V. Roscini and R. Coli, (2015). Bioactive compounds and antioxidant characterization of three edible wild plants traditionally consumed in the umbria region (central Italy): *Bunis erucago* L. (Corn rocket), *Lactuca perennis* L. (Mountain lettuce) and *Papaver rhoeas* L. (Poppy). *J. Appl. Bot. Food Qual.* **8**: 109-114.