Ethnobotanical Study of Wild Edible Plants in Bule Hora Woreda, Southern Ethiopia

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Abstract: Background: The people of the world as well as most rural communities in our country depend on wild edible plants during food scarcity. Therefore, this study aimed to document the wild edible plants and associated indigenous knowledge of the people in the Bule Hora Woreda, Borena Zone, Oromia National Regional State and Southern Ethiopia. Methods: The ethno botanical data was collected by semi-structured interview, group discussion, market survey and field survey from May 2013 to January, 2014. Later the data was analyzed through descriptive statistical methods and cluster analysis by using the software such as Microsoft Excel, SPSS and PAST-Paleontological Statistics. Results: A total of 29 wild edible plant species belongs to 27 genera and 22 families recorded in the area. The growth forms of these plants were dominated by shrubs (37.93%) and trees (27.59%), followed by tree/shrub forms (13.79%), herbaceous forms (13.79%) and climbers (6.90%). Fruits were mostly edible plant parts followed by tubers, young shoots, roots and gum. Some wild edible plants used for various purposes in addition to their consumption. About 83% of the wild edible plants in the area have no side effects although the dangerous spines and over dosage account about (17%). From the reported wild edible plants, only few plants sold as a food in the local markets. The main threats for wild edible plants in the area are over grazing, deforestation for agricultural practices and cutting for construction and home furniture.

Key words: Ethno botany - Wild edible plants - Indigenous knowledge - Bule Hora Woreda

INTRODUCTION

People of the world use the wild plant resources from the very beginning in ancient time to fulfill their needs [1]. The use of wild plant resource still continued in different parts of the world. Because, the wild plants play a crucial role for daily requirement of human beings such as medicine, food, spices, fence and shelter construction, timber production, etc. [2]. In addition to all these uses, wild edible plants contribute a lot for human diet; especially in poor rural communities during the period of food crisis. People of developing countries use the wild plants as a food in addition to the cultivated plants [3, 4]. Therefore, wild plants play an important role in complement staple foods to provide a balanced diet by supplying trace elements, vitamins and minerals and may do so again in the future [5, 6].

Wild edible plants are neither cultivated nor domesticated, but are available from their wild natural habitat and used as sources of food [5, 7]. On the other hand, domesticated plants are genetically modified species that completely depend on humans for survival [5] and commonly used as a food worldwide. That is, some wild edible plants genetically modified and domesticated as new cultivated varieties to be managed by human beings [8]. However, some plants seem to be the intermediate between wild and domesticated.

In our context, Ethiopia is one of the developing countries which depend on wild edible plants and their traditional knowledge to fulfill nutritional needs in addition to domesticated cultivars especially in the rural area during the period of food scarcity [9-11]. For instance, the populations of Ethiopia are familiar with the traditional knowledge of using wild edible plants for various purposes. These include utilization of wild edible plant resources for different human requirements such as food security, medicinal value, fuel wood production, charcoal production, timber production, house construction, etc. However, misuse of the wild plant resource cause extinction of the useful wild edible plants. As a result, the wild plant resources require considerable conservation for sustainable usage in the future.
In Ethiopia wild edible plants are facing threats in their natural habitats from various human activities such as fuel wood collection, harvesting for timber and walling or poles, etc. [9]. These practices adversely affect wild edible plants in the country and lead to the reducing of economically crucial food plants [11]. Since traditional knowledge on wild edible plants is being eroded through acculturation and the loss of plant biodiversity along with indigenous people and their cultural background, promoting research on wild food plants is crucial in order to safeguard this information for future societies [7].

However, majority of the ethno botanical studies in the country concerned with the traditional knowledge of medicinal plants instead of wild edible plants [12-19]. That is, only few ethnobotanical studies conducted concerning wild edible plants in the country. Particularly, in the Borana Zone the ethno botanical studies of wild edible plants have not carried out although the people in the Borana Zone also adapted to eat wild edible plants [20]. Thus, the current study was investigated to solve the major problems associated with the knowledge of the local people to use wild edible plants. The study aimed to document the wild edible plants and the associated indigenous knowledge of the people of Bule Hora Woreda, in Borana Zone, Southern Ethiopia.

MATERIALS AND METHODS

Study Area: The study was conducted in the Bule Hora woreda, Borena zone, Oromia National Regional State, Southern Ethiopia. The study area is composed of about 48 kebeles. Out of these, three kebeles were selected purposefully as representative study sites based on their location, climatic condition and distance from each other. The study sites (kebeles) were Didole Hara, Kilenso Mokonisa and Ropi Magada with weather conditions of semi-arid (Qola), mid highland (Weinadega) and highland (Dega) respectively (Figure 1).

The indigenous people of the study area (called Guji and Borana) are from the Oromo ethnic groups. The study area is semi-arid, with mean annual bimodal rainfall ranging between 400 mm and 500 mm [21] with the main rainy season expected between March and May and the short rain occurs between October and November [22]. The vegetation of the study area is typical of lowlands in some kebeles and also shows characteristics of highlands in the other areas.

Methods of Data Collection: The ethno botanical data was collected by semi-structured interview, group discussion, market survey and field survey [23]. Some of the wild...
edible plants were identified in the field. The collection of voucher specimens was also involved in the data collection. The data collection was carried out from May 2013 to January, 2014. The collected voucher specimens were later identified to species level at National Herbarium of Addis Ababa University. The field survey and semi-structured interview was used as a major tools for the collection of ethnobotanical information from the local people. The interview was carried out individually for each informant. It was conducted in the Afan Oromo language. A total of 75 respondents (25 from each kebele) of different age, sex, religion, occupation and educational level were interviewed and data was compiled for further analysis.

**Materials:** Materials such as Notebook with hard cover, Pen or pencil, Altimeter, GPS (Global Positioning System), Plastic bags, Filmsy, Blotters, Ventilators, Presser (flat wooden frames), Straps, Ethanol (70%), Digger, Sectors/pruning scissors, other supportive materials were used during data collection.

**Methods of Data Analysis:** A descriptive statistical method was used to summarize and analyse the ethnobotanical data. The illustrative tables and graphs were also used to summarize the data in precise form using the software programs such as Microsoft Excel and Statistical Packages for Social Sciences (SPSS). The similarity in wild edible plants among the study sites was assessed by cluster analysis using the computer program PAST – Palaeontological STatistics, version 1.56 [24]. That is, the cluster analysis was performed to show similarity between the wild edible plants among the study sites.

**RESULTS**

**Taxonomic Diversity of Wild Edible Plants in the Study Area:** A total of 29 wild edible plant species recorded under 27 genera and 22 families (Table 1). Among the 22 wild edible plant families Anacardiaceae was the most abundant wild edible plant family in the study area followed by Fabaceae, Moraceae, Myrtaceae, Rutaceae and Verbenaceae families.

**Habits of Wild Edible Plants in the Area:** The current finding revealed that the growth habits of wild edible plants of the study area were dominated by shrubs (37.93%) and trees (27.59%) followed by tree or shrub growth forms (13.79%), herbaceous forms (13.79%) and climbers (6.90%) (Figure 2).

**Plant Parts Used as a Food:** The current study revealed that fruits (79.31%) were mostly edible plant parts, tubers and fruits (3.45%), young shoots (6.90), young shoots and fruits (3.45%), roots (3.45%) and gums (3.45%) were the remaining edible parts (Figure 3).

**Modes of Consumption:** In the study area, the local people reported that about 89.66% of wild edible plants consumed raw outdoor. However, about 3.45% can be consumed raw or fermented, about 3.45% can be consumed raw or boiled and the rest 3.45% of wild edible plants in the area are found to be eaten cooked (Figure 4). According to the report of this finding, majority of the wild edible plants in the area consumed raw except Amaranthus caudatus L., Dioscorea bulbifera L. and Premna schimperi Engl., in which the edible parts can be cooked, boiled and fermented respectively for intake. No need of cooking, boiling or roasting of edible parts for consumption in majority of wild edible plants of the area.

**Side Effects of Wild Edible Plants in the Area:** The current study revealed that majority of wild edible plants (83%) in the area has no side effects on the human health. That means many wild edible plants in the area are not pathogenic or not diseases causing. However, few wild edible plants show negative effects due to over dosage (7%) and dangerous needles they possess (10%) (Figure 5). For example, the excessive consumption of the Pappea capensis Eckl and Zeyh fruits causes the burning of mouth parts, the excess intake of Rhus natalensis Krauss. fruits causes constipation (difficulty in emptying the bowels, associated with hardened faeces) and Carissa spinarum L., Capparis tomentosa Lam. and Acacia seyal Del. were reported for their dangerous spines during harvesting.

**Wild Edible Plants Similarity among the Study Sites:** The wild edible plants in the Ropi Magada and Kileno Mokonisa were more similar relative to those in the Didole Hara area (Figure 6).

**Marketability of Wild Edible Plants:** The wild edible plants in the study area are almost not sold in the local market except few plants as a food (Table 2). That is, only Syzygium guineense (Willd.) DC. and Syzygium guineense var. (Wild.) DC. had been sold in the past during the shortage of food in the area. But these wild edible plants do not sell in the market now a day.
Table 1: List of wild edible plants reported in the study area

<table>
<thead>
<tr>
<th>Scientific name</th>
<th>Local name</th>
<th>Family</th>
<th>Habit</th>
<th>Edible parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lenea rivae (Chiov.) Sacl.</td>
<td>Handaraku</td>
<td>Anacardiaceae</td>
<td>Tree</td>
<td>Fruit</td>
</tr>
<tr>
<td>Carissa spinarum L.</td>
<td>Agansa</td>
<td>Apocynaceae</td>
<td>Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Opuntia ficus-indica (L.) Miller.</td>
<td>Adaamii</td>
<td>Cactaceae</td>
<td>shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Syzygium guineense (Wild.) DC.</td>
<td>Awajo</td>
<td>Myrtaceae</td>
<td>Tree</td>
<td>Fruit</td>
</tr>
<tr>
<td>Balanites aegyptiaca (L.) Del.</td>
<td>Baddana</td>
<td>Balantiacceae</td>
<td>Tree/Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Syzygium guineense var. (Wild.) DC.</td>
<td>Baddesa</td>
<td>Myrtaceae</td>
<td>Tree</td>
<td>Fruit</td>
</tr>
<tr>
<td>Dioscorea bulbifera L.</td>
<td>Barodaa</td>
<td>Dioscoreaceae</td>
<td>Climber</td>
<td>Tuber, fruit</td>
</tr>
<tr>
<td>Puppea capensis Eckl and Zeyh</td>
<td>Biqqaa</td>
<td>Sapindaceae</td>
<td>Tree</td>
<td>Fruit</td>
</tr>
<tr>
<td>Rhus natalensis Krauss.</td>
<td>Dahoobessa</td>
<td>Anacardiaceae</td>
<td>Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Rume axysinicus Jacq.</td>
<td>Dhaangagoo</td>
<td>Polygonaceae</td>
<td>Herb</td>
<td>Young shoot</td>
</tr>
<tr>
<td>Olea europaea subsp. cuspidata (Wall. Ex G. Don) Cif.</td>
<td>Eiazza</td>
<td>Oleaceae</td>
<td>Tree</td>
<td>Fruit</td>
</tr>
<tr>
<td>Capparis tomentosa Lam.</td>
<td>Gora</td>
<td>Capparidaceae</td>
<td>Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Telea simplicifolia (Engl.) Verdoorn</td>
<td>Hadheesa</td>
<td>Rutaceae</td>
<td>Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Flacourtia indica (Burm. f.) Merr.</td>
<td>Hagalaa</td>
<td>Flacouritaceae</td>
<td>Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Grewia evolute Juss.</td>
<td>Haroressa</td>
<td>Tiliaceae</td>
<td>Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Ficus sur Forssk.</td>
<td>Harruu</td>
<td>Moraceae</td>
<td>Tree</td>
<td>Fruit</td>
</tr>
<tr>
<td>Physalis peruviana L.</td>
<td>Hawuxii</td>
<td>Solanaceae</td>
<td>Herb</td>
<td>Fruit</td>
</tr>
<tr>
<td>Sclerocarya birrea (A. Rich.) Hochst subsp.</td>
<td>Hudhaa</td>
<td>Anacardiaceae</td>
<td>Tree/Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Euclea divinorum Hiern</td>
<td>Me'esessa</td>
<td>Ebenaceae</td>
<td>Tree/Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Ficus glamosa Del.</td>
<td>Qilxuu</td>
<td>Moraceae</td>
<td>Tree</td>
<td>Fruit</td>
</tr>
<tr>
<td>Tamarindus indica L.</td>
<td>Roqqa</td>
<td>Fabaceae</td>
<td>Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Momordica foetida Schumach.</td>
<td>Surphhaa</td>
<td>Cucarbitaceae</td>
<td>Climer</td>
<td>Fruit</td>
</tr>
<tr>
<td>Cordia africana Lam.</td>
<td>Waddesa</td>
<td>Boraginaceae</td>
<td>Tree</td>
<td>Fruit</td>
</tr>
<tr>
<td>Premna schimperi Engl.</td>
<td>Xaxessa</td>
<td>Verbenaceae</td>
<td>Shrub</td>
<td>Young shoot, fruit</td>
</tr>
<tr>
<td>Clausena anisata (Wild.) Benth.</td>
<td>Xirdhoo</td>
<td>Rutaceae</td>
<td>Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Commiphora africana (A. Rich.) Engl.</td>
<td>Hammesaa</td>
<td>Burseraceae</td>
<td>Shrub</td>
<td>Root bark</td>
</tr>
<tr>
<td>Lantana camara L.</td>
<td>Dubaroo</td>
<td>Verbenaceae</td>
<td>Shrub</td>
<td>Fruit</td>
</tr>
<tr>
<td>Acacia seyal Del.</td>
<td>Wacuul</td>
<td>Fabaceae</td>
<td>Tree</td>
<td>Gum</td>
</tr>
<tr>
<td>Amaranthus caudatus L.</td>
<td>Raafuu</td>
<td>Amaranthaceae</td>
<td>Herb</td>
<td>Young shoot</td>
</tr>
</tbody>
</table>

Fig. 2: The growth forms of wild edible plants in the area

However, the wild edible plant called Tamarindus indica L. is sold still in the local market even though there is no food scarcity in the study area. In addition, other wild edible plants such as Olea europaea subsp. cuspidata (Wall. Ex G. Don) Cif. and Cordia africana Lam. were sold for other purposes. For example, Olea europaea subsp. cuspidata (Wall. Ex G. Don) Cif. was sold for its attractive smoke while Cordia africana Lam. was sold for timber production.

**Threats to and Conservation Status of Wild Edible Plants:** The main threats for wild edible plants in the area include over grazing by domestic animals, deforestation for agricultural practices and settlement and cutting for construction purposes and preparation of home furniture. Especially Momordica foetida Schumach. and Physalis peruviana L. grow near the home garden in coffee and cultivated plants and act as weeds. Thus farmers remove or cut these plants from their farm land (Figure 7).
Fig. 3: percentage of edible plant parts in the area

Fig. 4: Modes wild edible plants consumption in the area

Fig. 5: Percentage of side effects of wild edible plants

Fig. 6: The cluster analysis showing the similarities between wild edible plants among the study sites
Table 2: Frequency table for marketability of wild edible plants in the area

<table>
<thead>
<tr>
<th>Status</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sold in past</td>
<td>20</td>
<td>66.7</td>
<td>66.7</td>
</tr>
<tr>
<td>Sold recently</td>
<td>2</td>
<td>6.9</td>
<td>6.9</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

In addition, Syzygium guineense var. (Wild.) DC. was harvested for construction and Cordia africana Lam. was harvested for production of timber.

In the study area, the local people reported that some trees conserved in the natural forest or agro-forestry system. For example, Syzygium guineense var. (Wild.) DC. conserved in natural forest while Cordia africana Lam. conserved in agro-forestry near the home garden. In addition some plants like Momordica foetida Schumach. and Physalis peruviana L. grow with the living fences near the home garden.

Fig. 7: Dried Momordica foetida Schumach. cut by farmers from coffee plant

**DISCUSSION**

The reported wild edible plants in the area were eaten to combat against food scarcity and also taken as extra foods in addition to the cultivated plants. Similarly, eating wild edible plants was common throughout the country [7, 9, 11, 25-28]. This indicates the widely use of wild edible plants in the country to fight against food scarcity especially during the famine season.

Majority of wild food plants in the area were eaten as extra food instead of serving as regular meal. This indicates the uses of wild food plants as optional food during sufficient access of cultivated plants are available in the area. Likewise, the optional consumption of wild edible plants was happen in different parts of the world [29]. Although many wild edible plants got little emphasize by the local people, some are crucial a lot for their nutritional contents. Because, some wild edible plants are rich in essential amino acids, carbohydrate and minerals like calcium, Copper, Iron, Magnesium, Zinc, etc. [30].

The growth habits of wild edible plants of the study area were dominated by shrubs and trees. Likewise, the study conducted by [25] reported the abundance of wild edible trees and shrubs in the Debub Omo Zone, Southern Ethiopia. This implies the abundance of tree and shrub wild edible plants in different parts of the country relative to the other growth forms.

In the study area fruits, young shoots, tubers, roots and gum were found to be eaten by the local people. Among these edible parts, fruits account about 79.31% while the rest other parts cover about 20.69%. The other studies conducted by [7, 11] also reported that fruits were the dominant edible parts in the country. However, edible leaves were not reported in the study area. But leaves were important edible parts in the other parts of the world [2, 9, 11, 28, 31-33]. This might be correlated with the variation in the traditional knowledge of the local people in different areas. The people in some area adapted to eat fruits than the other parts while others adapted to eat leaves or stems than any other plant parts.

In the study area the edible parts of most wild edible plants consumed directly without any process except few. The outdoor consumption of wild edible plants mostly carried out by children and cattle rearing individuals. Similarly, the outdoor consumption of wild edible plants has been reported in agricultural fields, during cattle keeping and travelling [29, 32]. However, few plant parts were consumed by extracting the edible oil, by traditional fermentation of edible parts for drink and boiled for intake. Likewise, fermentation of edible fruits was also reported by Mengistu and Herbert [10] in the country. This indicates the ethnobotanical knowledge similarity of the local people to use wild edible plants in different parts of the world. Therefore, indigenous knowledge of wild food utilization is not restricted to only one place or country; instead it interrelated with the traditional knowledge in various parts of the world. This indigenous knowledge passes from the parents to the young generations traditionally.

The additional roles of wild edible plants include serving as raw materials for house construction, charcoal production, preparing of beehives, medicinal value, providing pleasant smoke, preparing ax holder, providing shade, timber production and food for cattle. For instance, Syzygium guineense var. (Wild.) DC. serve as raw material for house construction, used as a fuel and its natural hole serve as a shelter for honey bees, Pappea capensis Eckl and Zeyh, Teclea simplicifolia (Engl.) Verdoorn, Psidium gujava L. and Euclea divinorum Hiern serve as medicinal value for human being as well as for domestic animals,
Rhus natalensis Krauss. and Ficus sur Forssk. used for preparing of beehives, Olea europaea subsp. cuspidata (Wall. Ex G. Don) Cif. provide attractive smoke. In addition to the above functions, the wild edible plants may contribute many purposes beside their use for consumption. Likewise, the study conducted by Kebu [9] reported the use of wild edible plants for various purposes in addition to consumption. Moreover, some of the wild edible plant parts used as a food source were also ingested as a remedy [25]. For example, Saba comorensis (Boj.) Pichon, Moringa stenopetala (Bak. f.) Cuf., Ximenia americana L. and Grewia bicolor Juss. were also ingested for medicinal value. The use of wild edible plants for various purposes might increase the harvesting of plants for different functions. This may leads to the extinction of the wild edible plants in the area. Because, more targeted plants become rare in the local area [20]. As a result, wise use of these plants required for sustainable usage in the future.

The wild edible plants of the study area have only the over dosage and dangerous spines side effects. These indicate little bit risks of consuming wild edible plants in the area. Therefore, the wild edible plants in the area can be eaten by the local community without fear of side effects except few. However, according to the study conducted by [32] eye irritation, which in the worst case may lead to blindness during harvesting of Opuntia ficus-indica, skin and mouth irritation by Amorphophallus gombooczianus, reversible joint paralysis due to consumption of Justicia ladanoides Lam. were the major adverse effects mentioned.

The wild edible plants in Ropi Magada and Kilenso Mokonisa kebeles are more or less similar while those in Didole Hara kebele are relatively different. This might be correlated with the similarity of climatic condition and altitudes between the Ropi Magada and Kilenso Mokonisa than that of the Didole Hara. The wild edible plants which adapted to the semi-arid climate and high land areas found in Ropi Magada and Kilenso Mokonisa kebeles. But the wild edible plants which adapted to the arid climate and low land areas found in the Didole Hara kebele. Similarly, the study conducted by [11] also revealed various distributions of wild edible plants in semi-low land, low land and high land areas.

Few wild edible plants such as Syzygium guineense (Willd.) DC. and Syzygium guineense var. (Wild.) DC. were sold in the local market during the food scarcity whereas Tamarindus indica L. is sold still in the local market although there is no food scarcity in the study area. Some authors [32] revealed the increasing of selling wild edible plants during food scarcity rather than the other time. The marketability of wild edible plants was also revealed by the other studies [2, 4, 11, 26, 28, 31, 34, 35]. This indicates the contribution of wild edible plants in generating of income in addition to their use for consumption.

The other wild edible plants such as Olea europaea subsp. cuspidata (Wall. Ex G. Don) Cif. and Cordia africana Lam. were sold for other purposes. For example, Olea europaea subsp. cuspidata (Wall. Ex G. Don) Cif. was sold for its attractive smoke while Cordia africana Lam. sold for timber production. Similarly, the study conducted by [20] reported that the gum from Acacia Senegal is collected and sold in local markets. This indicates the selling of wild edible plants in the local markets for various functions in addition to their nutritional value.

The threats such as over grazing by domestic animals, deforestation for agricultural practices and settlement and cutting for construction and preparation of home furniture were reported in the area. Likewise, the study conducted by [7, 9, 11, 25, 27, 32] reported the agricultural expansions, overgrazing, deforestation, fuel wood collection and urbanization as the major threats of wild edible plants in the country. This might cause the depletion of wild edible plants throughout the country. Therefore, the awareness of the local community plays a great role to proceed these crucial wild edible plants and their indigenous knowledge for the future generations.

The local people reported some conservation strategies of wild edible plants in the natural forest, in agro-forestry system and near the home garden. Similarly, the study conducted by [28] reported the conservation of wild edible plants in agro-forestry and living fences. This indicates the similarity in the indigenous knowledge of the local people to conserve the wild edible plants in different parts of the country.

CONCLUSION

A total of 29 wild edible plant species belongs to 27 genera and 22 families recorded in the Bule Hora Woreda. These wild edible plants especially consumed during the food scarcity and sometimes consumed as extra food in addition to the cultivated plants. Moreover, the local communities have the indigenous knowledge to use the wild edible plants in the area. Accordingly, almost all wild edible plants in the study area were consumed outdoor except Amaranthus caudatus L., Dioscorea bulbifera L. and Premna schimperi Engl., in which their
edible parts cooked, boiled and fermented respectively for consumption. The outdoor consumption of wild edible plants mostly carried out by children and cattle rearing individuals.

In addition to the use for consumption, wild edible plants in the study area used for various purposes. These includes the use for house construction, charcoal production, preparing of beehives, medicinal value, providing pleasant smoke, preparing ax holder, providing shade, timber production and food for cattle. However, these multipurpose use of wild edible plants leads to the depletion and extinction of wild edible plants in the area. Additionally, threats such as over grazing, deforestation for agricultural practices and settlements also affect the wild edible plants in the area. Therefore, it is better to educate and create awareness in the local communities toward the conservation of these crucial plants for sustainable usage in the future.

The current study revealed that the main side effects of wild edible plants are over dosage and the effect of dangerous spines. Thus, it is better to reduce the effect of over dosage problem by managing the amount of intake. Moreover, carefully harvesting is also advisable to reduce the effect of dangerous spines.

Investigating the nutritional value of the reported wild edible plants will be important to conserve the most nutritionally valuable wild edible plants in the home garden. This may leads to the formal domestication of the most nutritionally valuable wild edible plants in the study area. Furthermore, conservation of nutrient full plants in the natural habitat is important to minimize extinction of crucial wild edible plants.

The current finding reported various threats of wild edible plants. Thus, the local community should develop conservation strategies and reduce deforestation practices. In addition, the practical domestication of wild edible plants required from the local community for sustainable use in the area. This is very important especially to arrive some wild edible plants which were found under threatened condition before the occurrence of extinction.

The wild edible plants of study area consumed during the food scarcity as well as extra foods in addition to the cultivated plants. Local communities have their indigenous knowledge to use these plants. Therefore, these plants require wisely harvesting, proper conservation and management practices for sustainable usage in the future.

REFERENCES


