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Diversity and conservation of medicinal plants in the Bomaa community of the Brong Ahafo region, Ghana

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The diversity and conservation status of medicinal plants were studied in the Aparapi forest reserve at Bomaa, Brong Ahafo Region, Ghana. Information on the medicinal plants was obtained from semi-structured questionnaires, interviews and field excursions involving herbalists and taxonomists. A total of 52 plant species belonging to 47 genera and 22 families were identified by the traditional herbalists as medicinal plants. These were used to treat a variety of diseases. Fabaceae was the most dominant family. The medicinal plants were categorised into four growth forms: trees (63.5%), climbers (15.4%), herbs (11.5%) and shrubs (9.6%). The most commonly harvested plant parts were leaves (40.3%). Most of the herbalists (56%) did not replant after harvesting. None of the herbalists had garden(s) where medicinal plants were cultivated. Majority of the traditional practitioners (57%) did not have trainees. Transmission of knowledge to trainees was mainly informal. Most of the herbalists did not keep records on the diseases treated and the plants used. Some of the harvesting methods employed by the herbalists were destructive. The herbalists confirmed a decrease in the richness and abundance of some of plant species including threatened ones. Harvesting of such species should be regulated by the forestry commission of Ghana.

Key words: Conservation, diversity, Ghana medicinal plants, semi-deciduous forest.

INTRODUCTION

Plants are a great source of medicines, especially in traditional medicine, which are useful in the treatment of various diseases (Bako et al., 2005). Traditional medicine has not only played a vital role in providing healing but has also contributed to the discovery of most pharmaceutically active substances in plants (Principe, 1991; Pearce and Puroshothaman, 1992) which have been used in the commercial production of drugs. It has been estimated that up to 90% of the population in developing countries rely on the use of medicinal plants to help meet their primary health care needs (WHO, 2002). Apart from their importance in the primary health care system of rural communities (Fink, 1990) medicinal plants also improve the economic status of rural people involved in their sales in markets all over the world (Robbins, 2000; Ticktin et al., 2002).

About 50,000 of the flowering plants occurring in the world have been studied for their medicinal purposes (Govaerts, 2001). In India, more than 43% of the total flowering plants are reported to be of medicinal importance (Pushpangadan, 1995). These flowering plants occur in many families, with some of the families having more medicinal plant species than others. The most species rich medicinal plant families include Fabaceae, Asteraceae and Lamiaceae (Kakudidi et al., 2000; Okello and Ssegawa, 2007; Kamatenesi-Mugisha et al., 2008). Medicinal plant species also show diversity in their parts used for the treatment of diseases, with leaves, roots and barks being the most commonly harvested parts used in herbal medicine preparation (Kamatenesi-Mugisha et al., 2008). In traditional medicine, different plant parts are commonly used to treat various diseases, although the modes of preparation and application differ from one healer to another (Okello and Ssegawa, 2007).

Increasing demands for medicinal plants internationally have resulted in the over-exploitation and indiscriminate over-harvesting of medicinal plants. The degree of distri-

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disturbance to the species population and vulnerability to over-exploitation depends on demand and supply (Anonymous, 1997; Robbins, 2000), the part used, and the life form (Cunningham, 1991). Particularly vulnerable to over-exploitation are the scarce slow growing forest species (Cunningham, 1991). The kind of harvesting technique employed is important in the conservation of medicinal plants as some of them may be destructive (Falconer et al., 1992; Okello and Ssegawa, 2007; Kamatenesi-Mugisha et al., 2008). In view of these threats to medicinal plants there is the need for sustainable management, cultivation and conservation of medicinal plants (WHO et al., 1993). All programmes should be directed at developing and protecting tropical forest regions and their medicinal plants since numerous medicines have been derived from the knowledge of tropical forest people, and there are more yet to be discovered (Dhillion et al., 2002; Tabuti et al., 2003).

Although traditional medicine has been practised in Ghana for many years, literature on most of the plants used for the treatment of diseases is scanty. Furthermore, the increasing alarming rate of deforestation in Ghanaian forests (IDRC, 2004) coupled with overexploitation of medicinal plants (Uniyal et al., 2006) makes it imperative for inventory on medicinal plants to be conducted in Ghanaian forests as recommended by WHO et al. (1993). The study was aimed at determining the diversity and conservation of medicinal plants in the Aparapi forest reserve used by the Bomaa community in the Brong Ahafo region of Ghana.

MATERIALS AND METHODS

The study was conducted at the Bomaa community located in the Tano South District of the Brong Ahafo region, Ghana (latitude 7°00' N – 7°25' N and longitude 1°45' W – 2°15' W). The main occupation of the community are farming and traditional herbal medicine practice. Field excursion occurred in the Aparapi forest reserve which is located in the same community. The moist semi-deciduous forest which covers an area of 19.03 km² has many economic tree species including *Milicia excelsa* (Welw.) C. Berg, *Ceiba pentandra* (L.) Gaertn., *Khaya ivorensis* A. Chev. etc. The Bomaa community lies in the Semi-equatorial climatic zone which experiences double maximum rainfall pattern. The first rainfall season is from April to June, with the heaviest in June and the second period is from September to October. The mean annual rainfall is between 1250 and 1800 mm. The dry season is quite pronounced and occurs between the months of November and March each year. The mean monthly temperatures range between 26 and 30°C. Relative humidity ranges between 75 - 80% in the rainy season and 70 - 72% in the dry season (Source: Tano South District Agriculture Office).

The study which was conducted between September 2007 and March 2008 involved the administration of semi-structured questionnaires, interviews with both individual herbalists and group of herbalists (Martin, 1995), and botanical inventory in the Aparapi forest. There were 32 herbalists and two taxonomists engaged in the study. Since most herbalists in the village obtain their medicinal plants from the same forest, the field work involved group excursions (Kamatenesi-Mugisha et al., 2008). The data collected were used to supplement the information on plant names, plant parts used and conservation status of the medicinal plants

(Kamatenesi-Mugisha et al., 2008). It also offered the opportunity of obtaining first hand information on the harvesting practices adopted by the herbalists. To know the relative importance of the medicinal plants in the Aparapi forest, all plant species encountered were enumerated regardless of their medicinal status. Identification of the plant species was carried out by herbalists, taxonomists, and with reference to local as well as regional manuals and Floras (Hawthorne, 1990; Arbonnier, 2004; Poorter et al., 2004; Hawthorne and Jongkind, 2006). Identification was confirmed at the herbaria of the Kwame Nkrumah University of Science and Technology, Kumasi, Ghana and the Forestry Commission, Kumasi, Ghana where voucher specimens were also deposited.

RESULTS

Diversity of medicinal plants

A total of 73 plant species were identified in the study. Out of this number, 52 species belonging to 47 genera and 22 families were identified by the traditional herbalists as medicinal plants. These were distributed in four growth forms, namely trees (63.5 %), climbers (15.4%), herbs (11.5%) and shrubs (9.6%) (Table 1). The family Fabaceae was the most represented (eight species) followed by Sterculiaceae (five species) and Moraceae (five species). Nine families including Anacardiaceae, Ulmaceae, Araceae and Palmaceae had one species each (Table 1).

The medicinal plants were used to treat many kinds of diseases such as cancer, sexual disorders, pneumonia, pains and typhoid fever (Table 2). For some of the plants, the same parts were used for the treatment of diseases differently. The medicines were administered in different forms but mostly in liquid form (Table 2). Most of the treatments involved the use of leaves (40.3%) and bark (32.3%) of the plants (Figure 1). The traditional herbalists employed hand plucking, hoe cutting, cutlass cutting and uprooting as the harvesting methods (Figure 2)

Conservation of medicinal plants

Half of the herbalists (50%) engaged were above 52 years of age (Figure 3). More than a quarter of them (28.6%) were above 70 years old. Forty-four percent of the herbalists adopted conservation methods by way of replanting after harvesting, whereas the remaining 56% did not replant after harvesting. Replanting involved the use of seeds and stems (22% each) (Figure 4). None of the traditional herbalists had garden(s) where medicinal plant species were cultivated.

The survey revealed that only 28.6% of the herbalists kept records of the diseases they treated, and the plants they used in the treatment. The remaining herbalists (71.4%) did not keep records of the diseases treated as well as the respective plants used. The herbalists who kept records basically wrote them on pieces of paper.

Forty-three percent (43%) of the traditional herbalists had trainees while the remaining did not have any trainees. Twenty nine per cent of the trainees were child-

Table 1. Medicinal plant species in the Aparapi forest reserve.

Scientific name	Local name	Family	Growth habit
<i>Acacia kamerunensis</i> Gand.	Nnwere	Fabaceae	Climber
<i>Azela africana</i> * Sm.	Papao	Fabaceae	Tree
<i>Albizia zygia</i> (DC.) J.F. Macbr.	Okro	Fabaceae	Tree
<i>Antiaris toxicaria</i> Engl.	Kyenkyen	Moraceae	Tree
<i>Antrocaryon micraster</i> * A. Chev. & Guillaum	Aprokuma	Anarcadiaceae	Tree
<i>Baphia nitida</i> Lodd.	Odwen	Fabaceae	Tree
<i>Berlinia confusa</i> Hoyle	Nseduansehoma	Fabaceae	Tree
<i>Blighia sapida</i> Koenig	Akye	Sapindaceae	Tree
<i>Blighia welwitchii</i> (Hiern) Radlk.	Akyekobri	Sapindaceae	Tree
<i>Bombax buonopozense</i> P.Beauv.	Akatanini	Bombaceae	Tree
<i>Carapa procera</i> DC.	Kwaebebe	Meliaceae	Tree
<i>Ceiba pentandra</i> (L) Gaertn.	Onyina	Bombaceae	Tree
<i>Celtis mildbraedii</i> Engl.	Esa	Ulmaceae	Tree
<i>Cercestis afzelii</i> Schott	Batatwene	Araceae	Climber
<i>Chromolaena odorata</i> (L) King & Robinson	Acheamong	Asteraceae	Herb
<i>Cleistopholis patens</i> (Benth.) Engl. & Diels	Abotokuradua	Annonaceae	Tree
<i>Cnestis ferruginea</i> Vahl ex DC.	Aɔɔsen	Connaraceae	Shrub
<i>Cola gigantea</i> A.Chev.	Awapuo	Sterculiaceae	Tree
<i>Desmodium adscendens</i> (Sw.) DC.	Aboa-nkatie	Fabaceae	Herb
<i>Dracaena arborea</i> (Wild.) Link	Nsomme	Dracaenaceae	Shrub
<i>Elaeis guineensis</i> Jacq.	Abɛ	Palmaceae	Tree
<i>Ficus exasperata</i> Vahl	Nyankyere	Moraceae	Shrub
<i>Ficus sur</i> Forssk.	Doma	Moraceae	Tree
<i>Gongronema latifolium</i> Benth.	Ansrogya	Apocynaceae	Climber
<i>Griffonia simplicifolia</i> (Vahl ex DC.) Baill.	Kagya	Fabaceae	Climber
<i>Heritiera utilis</i> * (Sprague) Sprague	Kwakuoaduaba	Sterculiaceae	Tree
<i>Jatropha curcas</i> L.	Nkanyadua	Euphorbiaceae	Shrub
<i>Kigelia africana</i> (Lam.) Benth.	Nufutene	Bignoniaceae	Tree
<i>Landolphia owariensis</i> P.Beauv.	Kooko ahoma	Apocynaceae	Climber
<i>Mansonia altissima</i> * (A.Chev.) A.Chev.	Opron	Sterculianaceae	Tree
<i>Marantochloa leucantha</i> (K.Schum.) Milne-Redh	Sibrie	Marantaceae	Herb
<i>Milicia excelsa</i> * (Welw.) C.C.Berg	Odum	Moraceae	Tree
<i>Monodora myristica</i> (Gaertn.) Dunal	Wedeeaba	Annonaceae	Tree
<i>Morinda lucida</i> Benth.	Konkroma	Rubiaceae	Tree
<i>Nauclea diderrichii</i> * (De Wild. & T.Durand)	Merrill Kusia	Rubiaceae	Tree
<i>Newbouldia laevis</i> (P.Beauv.) Seem. ex Bureau	Anansententan	Bignoniaceae	Tree
<i>Ocimum gratissimum</i> L.	Onunum	Lamiaceae	Shrub
<i>Parquetina nigrescens</i> (Afzel.) Bullock	Abakamo	Apocynaceae	Climber
<i>Paullinia pinnata</i> Linné	Twentini	Sapindaceae	Climber
<i>Phyllanthus amarus</i> Schumach. & Thonn.	Bomagueakyire	Euphorbiaceae	Herb
<i>Ricinodendron heudelottii</i> (Baill.) Pierre ex Pax	Wama	Euphorbiaceae	Tree
<i>Smilax krausianna</i> Meisn.	Sawoma	Smilacaceae	Climber
<i>Talbotiella gentii</i> Hutch. & Greenway	Takurowanua	Fabaceae	Tree
<i>Terminalia ivorensis</i> A.Chev.	Emire	Combretaceae	Tree
<i>Terminalia superba</i> Engl. and Diels	Framo	Combretaceae	Tree
<i>Thaumatococcus daniellie</i> (Bennet) Benth.	Anwonomoo	Marantaceae	Herb
<i>Thaumatococcus</i> spp.	Aworampan	Marantaceae	Herb
<i>Theobroma cacao</i> L.	Kookoo	Sterculiaceae	Tree
<i>Trichilia martineau</i> Aubrév. & Pellegr.	Tanuronua	Meliaceae	Tree
<i>Trichilia monadelph</i> (Thonn.) de Wild.	Tanuro	Meliaceae	Tree

Table 1. Cont'd.

<i>Trilepisium madagascariense</i> DC.	Okure	Moraceae	Tree
<i>Triplochiton scleroxylon</i> K.Schumm.	Wawa	Sterculiaceae	Tree

* Threatened medicinal plant species.

Table 2. Diversity in medicinal plant parts used, their mode of preparation and administration, and the purpose of their use.

Scientific name	Part used	Disease treated	Mode of preparation and administration
<i>Acacia kameruneensis</i>	Leaves	Measles	Grind dry leaves, boil and drink
<i>Azelia africana</i>	Bark	Piles & pneumonia	Boil and drink
<i>Albizia zygia</i>	Bark	Stomach upset & infertility	Boil and drink
<i>Antiaris africana</i>	Bark	Stomach upset & anaemia	Boil and drink
<i>Antrocaryon micraster</i>	Bark	Chicken pox	Grind with seeds of <i>Xylopiya aethiopica</i> and <i>Afromomum melegueta</i> and then rub on the body
<i>Baphia nitida</i>	Leaves	Fever & high blood pressure	Boil and drink
<i>Berlina confusa</i>	Leaves or roots	Menstrual pains	Use as enema or boil and drink
<i>Blighia sapida</i>	Leaves or bark	Stomach upset	Boil and drink
	Roots	Sexual weakness	Boil and drink
<i>Blighia welwitschii</i>	Bark	Measles	Enema
<i>Bombax buonopozense</i>	Leaves	Candidiasis	Grind and insert into the vagina
<i>Carapa procera</i>	Bark	Body pains	Boil and drink
<i>Ceiba pentandra</i>	Bark	Hernia	Enema
<i>Celtis mildbraedii</i>	Bark	Hernia	Enema
		Pneumonia	Boil and drink
<i>Cercestis afzelii</i>	Stem	Gonorrhoea	Grind, add water and drink
<i>Chromolaena odorata</i>	Leaves	Wound healing	Grind and apply to the wound
<i>Cleistopholis patens</i>	Bark	Impaired growth	Boil and bath child with it
<i>Cnestis ferruginea</i>	Leaves	Dysentery	Decoction
	Fruits	Oral hygiene	Chew fruits
<i>Cola gigantea</i>	Bark	Waist pains	Boil and drink
	Dry leaves	Stomach ulcer	Boil and drink
<i>Desmodium adscendens</i>	Leaves and stem	Asthma	Boil and drink
<i>Dracaena arborea</i>	Dry leaves	Stomach ulcer	Boil and drink
<i>Elaeis guineensis</i>	Fruits	Boil	Oil from the fruit is applied to the affected part of the body
<i>Ficus sur</i>	Leaves & seeds	Production of abundant breast milk	Boil and drink
<i>Ficus exasperata</i>	Leaves	Asthma, cataract	Grind, add water and drink
<i>Gongronema latifolium</i>	Stem	Pneumonia	Chewing stick
	Leaves	Cough	Grind, add water and drink
<i>Griffonia simplicifolia</i>	Roots	Impotence	Boil and drink
	Leaves	Headache	Enema
<i>Heritiera utilis</i>	Dry leaves	'Kwashiokor'	Boil and drink
<i>Jatropha curcas</i>	Leaves	Wound healing	Grind and apply to affected part of the body
<i>Kigelia africana</i>	Bark	Infertility	Boil and drink
<i>Landolphia owariensis</i>	Leaves	Malaria	Decoction
	Roots	Gonorrhoea	Soak roots in gin for a week and drink extract
<i>Mansonia altissima</i>	Dry leaves	Body pains	Boil and drink
<i>Marantochloa leucantha</i>	Seeds	Boils	Swallowing
<i>Milicia excelsa</i>	Bark	Headache	Enema
<i>Monodora myristica</i>	Seeds	Stomach ache	Grind with ginger and use as enema
	Seeds	Candidiasis	Enema

Table 2. Cont'd.

<i>Morinda lucida</i>	Leaves	Fever, malaria	Grind, add water and drink
	Leaves	Typhoid fever	Boil and drink
	Bark	Candidiasis	Boil and drink
<i>Nauclea diderrichii</i>	Roots	Sexual weakness	Used with bitters (Decoction)
<i>Newbouldia laevis</i>	Leaves	Bone fracture	Grind and bandage
<i>Ocimum gratissimum</i>	Leaves	Wound healing	Grind and apply to affected part of the body
<i>Parquetina nigrescens</i>	Leaves	Boils	Grind and apply to affected part of the body
	Roots	Waist pains	Enema
<i>Paullinia pinnata</i>	Roots	Sexual weakness	Chewing stick
	Roots	Rheumatism	Grind with 'wisa' and rub to affected body part
<i>Phyllanthus amarus</i>	Leaves	Typhoid fever	Boil with leaves of <i>Terminalia catappa</i> and drink
<i>Ricinodendron heudelotii</i>	Leaves	Infertility & anaemia	Boil and drink
	Bark	Anaemia	Boil and drink
<i>Smilax kraussiana</i>	Roots	Impotence	Boil and drink
	Bark	Piles	Boil and drink
<i>Talbotiella gentii</i>	Roots	Cancer	Boil and drink
<i>Terminalia ivorensis</i>	Leaves	Fever	Boil and drink
	Bark	Stomach upset	Boil and drink
<i>Terminalia superba</i>	Dry leaves	Stomach ulcer	Boil and drink
<i>Thaumatococcus daniellie</i>	Leaves	Dewormer	Enema
<i>Thaumatococcus</i> spp.	Leaves	Dewormer	Enema
<i>Theobroma cacao</i>	Roots	Cough & inner pains	Chewing
<i>Trichilia martineau</i>	Bark	Candidiasis	Boil and drink
<i>Trichilia monadelpha</i>	Bark	Waist pains	Enema
		Candidiasis	Grind and insert into the vagina
<i>Trilepisium</i>	Bark	Candidiasis	Grind and insert into the vagina
<i>madagascariense</i>			
<i>Triplochiton scleroxylon</i>	Roots	Proper positioning of a baby in the womb	Boil and drink

ren of the herbalists while 14% of the trainees were grandchildren (Figure 5). Most (86%) of the traditional herbalists interviewed and questioned reported of a decline in the richness and abundance of some of the medicinal plant species they harvested.

DISCUSSION

Diversity of medicinal plants

Medicinal plants featured prominently among all the species identified in the Aparapi forest reserve, constituting about 71.2% of all the plant species. It should be noted that the remaining 28.8% of the species do not necessarily lack medicinal properties. Probably, their medicinal properties have not yet been found by the traditional healers. The medicinal plants showed family dominance, suggesting that some families are more important source of potential medicinal plant species than others. The family Fabaceae contributed most species to the medicinal plant diversity in this study as was observed in other studies (Kakudidi et al., 2000;

Bukenya-Ziraba and Kamoga, 2007; Okello and Ssegawa, 2007). The first three families namely, Fabaceae, Sterculiaceae and Moraceae contributed more than one-third (34.7%) of the medicinal plant species. In contrast to the work of Bukenya-Ziraba and Kamoga (2007), trees and shrubs were the predominant and least growth forms respectively, harvested by the traditional healers.

The study revealed diversity in plant parts used for the treatment of diseases. Consistent with other studies (Kamatenesi-Mugisha et al., 2008; Okello and Ssegawa, 2007; Yineger et al., 2008) leaves were the most commonly harvested parts of medicinal plants used for herbal medicine preparation. A plant could be used to cure more than one ailment depending on the part used and the mode of preparation. Different herbalists could use the same plant part to treat different diseases via the same modes of preparation and administration. Others could also use the same plant part for curing different diseases but with different modes of preparation and administration. This indicates the diverse ability of a plant part to cure different diseases depending on the herbalist

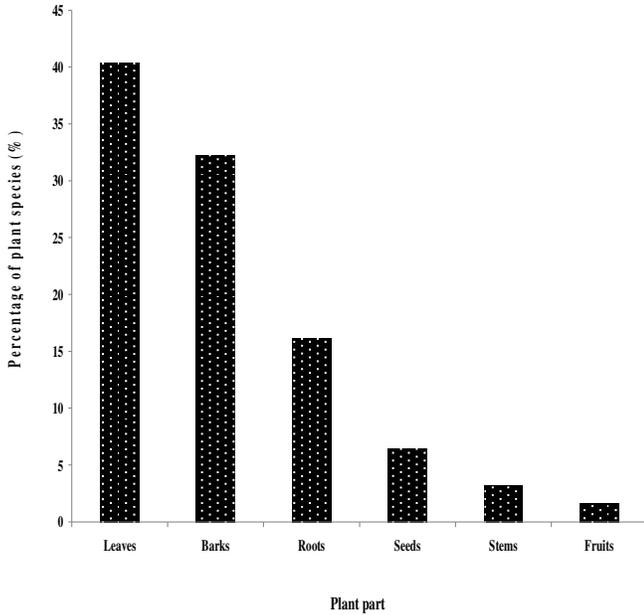


Figure 1. Plant parts used in the treatment of diseases.

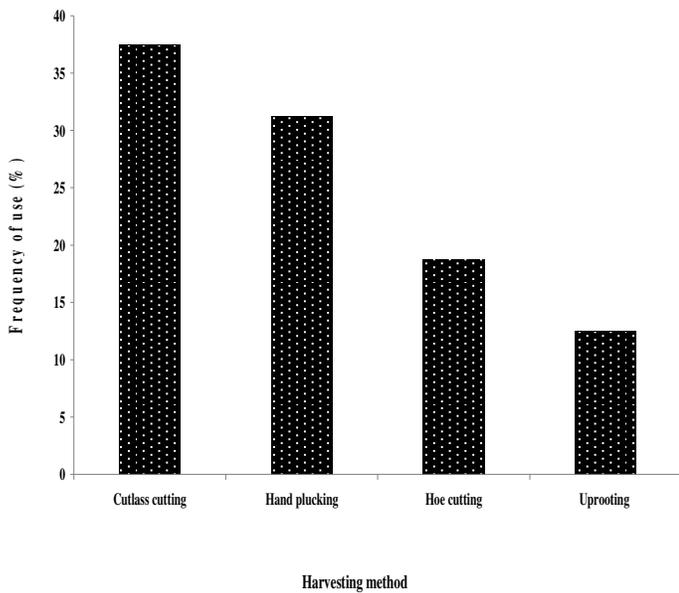


Figure 2. Harvesting methods employed by the traditional herbalists

herbalists, and the modes of preparation and administration. Some of the medicines were prepared by combining different plants. According to the traditional healers, medicines prepared by combining two or more plants are more potent than those prepared with single plants. This has been attributed to the combined effects of the plants (Okello and Ssegawa, 2007). Most of the medicines were prepared by boiling the medicinal plants, and administered by drinking as recorded by Delang

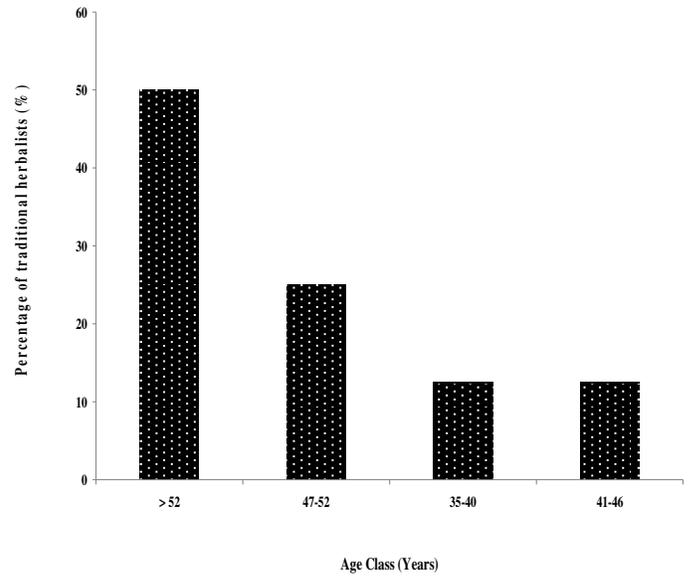


Figure 3. Age distribution of the traditional herbalists.

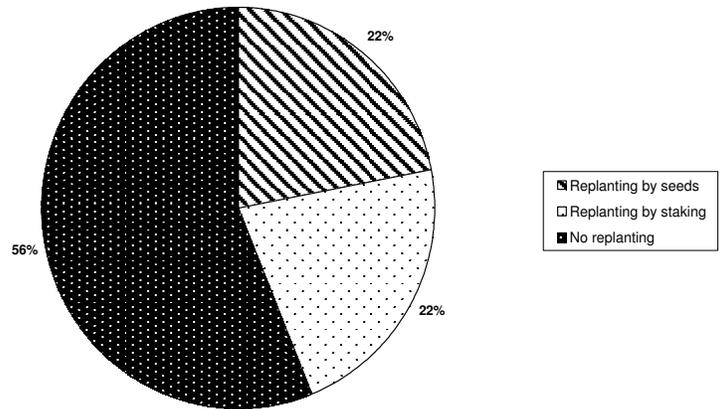


Figure 4. Replanting methods used by the traditional herbalists

(2007).

Conservation of medicinal plants

The traditional knowledge of medicinal plants can be useful in their conservation. While most of the traditional herbalists were advancing in age (between 50 - 115 years) majority of them did not have trainees. According to them, the work demands interest, devotion and enthusiasm, qualities which the young ones do not possess. Consequently, a few young ones who attempted to learn the profession were compelled to abandon it. Among those who had trainees, transmission of knowledge was mainly informal. Consistent with the observation of Yineger et al. (2008), only a few of the herbalists kept records of the diseases treated and the plants used for the treatment. Generally, records were kept by writing on

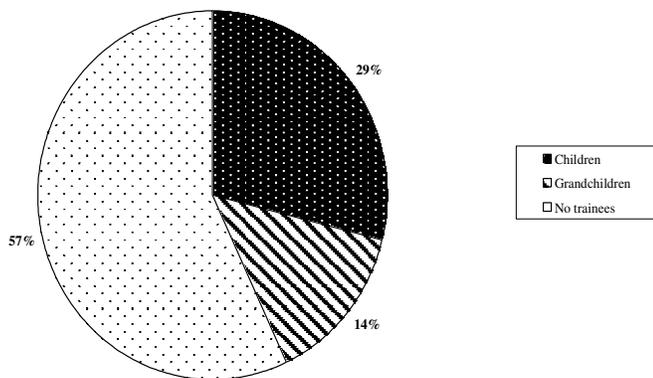


Figure 5. Transmission of knowledge on medicinal plants by the herbalists

on pieces of paper. Majority of the herbalists kept plants used and diseases treated in memory. These developments pose threat to conservation of medicinal plants in the area since the traditional healers may depart with their knowledge.

For a continual supply of plant materials needed for medicine, plants should be cultivated in gardens (WHO et al., 1993). This was however, not the practice at the Bomaa village, as none of the herbalists had garden(s) where medicinal plants were cultivated. They preferred plant materials from the wild to the cultivated materials. According to them cultivated medicinal plants are of less therapeutic efficacy compared to wild harvested plants. Furthermore, some of them thought that cultivating the medicinal plants in gardens would expose their medicinal plants to other herbalists. Similar findings have been reported by Fuller (1991), Bukenya-Ziraba and Kamoga (2007) and Okello and Ssegawa (2007). With this practice, the utilisation of plant materials from the Aparapi forest reserve is not sustainable, since continual dependence on the forest would deplete wild stocks, and possibly decline the habitats of the native plants thereby reducing their ability to meet the expanding market for medicinal plant products. Harvesting cultivated materials from gardens reduces the pressure on the wild species, especially the rare, endangered or over-exploited ones thus forestalling their possible extinction (WHO et al., 1993).

The use of environmentally friendly practices on non-timber forest products from wild ecosystems presents practical challenges to managers and conservationists (Kamatenesi-Mugisha et al., 2008). Some of the harvesting methods employed by the herbalists were destructive. The uprooting of whole plants to get their roots for medicines was not appropriate as the other parts of the plants were not used in most cases. Harvesting of leaves by some of the herbalists involved cutting down of branches that had flowers and fruits. This unfriendly harvesting practice wastes flowers and fruits, thereby affecting dispersal and regeneration of the

species involved. The morphology of some of the plant species suggested excessive harvesting of plant parts especially roots and bark. Harvesting of roots and barks of plants affects the survival of the plant and may even kill it (Kamatenesi-Mugisha et al., 2000; Kamatenesi-Mugisha and Bukenya-Ziraba, 2002). For this reason, root and bark harvesting of a plant should be minimal and gradual so as to allow enough time for the regeneration of the plant.

The herbalists reported a decrease in the richness and abundance of plant species harvested. They also disclosed that some of the species were being over-exploited due to their relatively higher medicinal importance and increasing market demands. The affected plant species included those which have been listed as threatened by Hawthorne and Abu-Juam (1995) and the IUCN (2001). Serious attention should be given to conserving these plant species and their habitats in view of the foregoing threats and the total dependence of the herbalists on the Aparapi forest reserve. In line with the recommendation by WHO et al. (1993), the Forestry Commission of Ghana should regulate the harvesting of these threatened species before they become extinct. Further studies should be conducted on these medicinal plants to determine their activities and the active components responsible for curing the diseases enumerated by the herbalists.

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