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Distribution of the horticultural plants in Togo according to decorative parts and medicinal value

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Ornamental plants, Medicinal plants, Parts used, Togo

A B S T R A C T

In Togo, more than six hundred species of horticultural plants are identified and composed of approximately 59% of Dicotyledons (49 families, 145 genera and 315 species) and 37.37% of monocotyledons. Pteridophytes and gymnosperms account for less than 6%. The spectrum of morphological types indicates that herbs are account for 55%, while trees and shrubs represent 15%. More than 50% of the species of this flora is exotic horticulture. A species distribution is made according to their decorative parts and their place of use. Across the country, 55 plantings are recorded and unevenly distributed in cities. Apart from their ornamental purpose, ornamental plants are used for feeding, traditional and industrial cosmetics in psychotherapy, horticultural therapy and in traditional and conventional medicine. In this study, 79 species from 39 families are reported as medicinal plants. The Apocynaceae and Fabaceae (6 species), the Euphorbiaceae and Liliaceae (5 species), the Arecaceae and Verbenaceae (4 species) are the best represented families.

Introduction

Concerned with the preservation and the improvement of the wild plants quality and the increase of their yield, the human being has early tried to tame over larger or smaller surfaces (Mboh, 2001). But beyond this utility concept, many peoples love plants only for their beauty sake. They are also loved because of the scent exhaled by their parts and are used for various events (births, birthdays, weddings, funerals, etc.). The ornamental plants beautify the living environment and the flower goes along with every moment of emotion (Ake Assi, 2010; Radji et al, 2010). Therefore the productions of horticultural products such as cut flowers and foliage, potted plants, bedding plants, bulb growing and nurseries, have resulted in various industries including the distillery for the production of essential oils, the production of substances for the pharmaceuticals, dietary supplements and aromatic herbs (and Widehem et Cadic, 2005; Viguier, 2006).

In an increasingly urbanized environment, the need for greenery and flowers is being more and more felt. In sub-Saharan Africa, where only 10% of the lands are considered arable, the horticultural products are grown mainly by small and medium planters (Radji et al, 2010; Wasilwa, 2008, Wagner, 2005).

This study was conducted in order to establish a classification of species used in ornamental horticulture in Togo. This classification is established according to their systematic group, parts needed in the plants, the line of life, places of use and especially those used in traditional medicine.

Materials and Methods

The floristic inventory was conducted in the city of Lomé and its surroundings, then in the cities of Atakpamé and Kpalimé (Figure 1). Apart from these three cities, no flower planting has been identified in the other cities in Togo. However, the study takes into account the landscaped areas and the private gardens in public or private administrative institutions. Each planting or landscaped areas or garden was considered as a botanical survey either 55 plantings across the country, including 1 in Atakpamé 1 in Kpalimé and 53 in Lomé and its surroundings.

The species recorded are identified based on the flora of Berhaut (1971-1988), Byrd Graf (1981), Le Houérou (1987), Grisvard et al. (1990) and Hessayon (1992). Further informations are collected from those of Hutchinson and Dalziel (1953-1967), Brunel et al. (1984) and Lebrun et Stork (2003, 2006 and 2008). The nomenclature used is that of the mentioned authors. Data from the International Code of Botanical Nomenclature (2007) and those of the websites of the Index Nominum Genericorum (ING), the International Plant Names Index (IPNI) and the Harvard University Herbaria (HUH) were used for the names of authors and synonyms. The classification of ornamental plants followed that of Vidalie (1998) and Aké-Assi (2002). The Works of Radji et al. (2010, 1998), Ake-Assi et al. (2010), Porter et al. (2004) allowed clarifying the origin countries of the plants.

In each planting, an ethno botanical survey has covered therapeutic uses of the identified species. This work was conducted with 279 respondents. The data collected were supplemented with two (2) Traditional Practioners in Lomé. They were subsequently brought into line with those that already existed in the reference literature (Ake Assi, 2010, 2002; Florence et al, 2007. WHO, 2000). The ethno botanical information collected were recorded on sheets of raw data and then transferred to a database. They were processed and analyzed under RGui 2.7.0 statistical software (Ihaka & Gentleman, 1996) to obtain standardized data concerning the key constituents, therapeutic properties and uses assigned to each reported species, the parts used and the most commonly mentioned methods of preparation. The status of rare species is indicated by an index of scarcity RI obtained from the equation of Géhu et Géhu (1980), where *ni* indicates the number of readings in which the species *i* is present and *N*, is the total number of readings:

$$RI = \{1 - (ni|N)\} \times 100$$

Results and Discussion

Floristic richness

In Atakpamé, 123 species distributed in 42 families and 93 genera wre identified. In Kpalimé, 138 species identified were divided into 54 families and 103 genera. In

the capital city Lomé, the number of species identified is 612 divided into 246 genera and 80 families. All the species identified outside Lomé estimated at 300 species are at 100% found in the list of the species identified in Lomé and its surroundings. However, nearly 500 species accounted in Lomé are not yet grown in the other cities.

The floristic richness is on the average 142.91 ± 57.92 species per planting. The relationship between the floristic richness and the age of the nursery (Figure 2) is defined by the equation y=0.069 x + 0.449 with R^2 = 0.236. This significant relationship shows that the experience acquired by the planting operator over time, especially by taking into account the demands and requirements of customers and the need to meet customer demand, is a factor that can improve the species richness of horticultural planting.

Preferential species

In number of 274, the "preferential species" (RI <80%) represent 44.77% of the species surveyed. The 15 most common species found in the 55 occurrences are, in alphabetical order, *Aloe vera* L. var. *chinensis, Bougainvillea glabra, Catharanthus roseus* (L.) G. Don, *Cordyline terminalis* (L.) *Kunth., Dieffenbachia amoena, Dracaena arborea* (Willd.) Link., *Erythrina indica* Lamk. var. *picta* L. *Euphorbia millii* Des Moul. var. *breonii, Ficus bengamina* L., *Ficus retusa* L., *Ixora macrothyrsa, Murraya paniculata, Nerium oleander, Pithecellobium dulce* (Roxb.) Thunb., *Polyalthia longifolia.*

With RI ≥ 80%, 338 species (55.23%) are "rare" and were listed in less than 10% of the readings. Among them, 67 have only one occurrence (RI ≥ 98.18%). This is the case of *Calathea makoyana E.* Morr. & Boom, *Cryptostegia grandiflora* Br. R. ex Lindl., *Davallia bullata* Wall. Ex Hook., *Echinocereus pectinatus* Engelm., *Ficus elastica* Roxb. var. *decora, Monstera deliciosa* Liebm., *Oxalis ovate* Ruiz ex Knuth, A. *Tithonia diversifolia* A. Gray, *Vanda caerulea* Griff. ex Lindl. and *Zamia furfuracea* L.f .

Origin of the plants of the horticultural flora in Togo

More than half (52%) of the horticultural flora species in Togo originate from Americas against less than 20% from Africa (Figure 3). Outside the Americas (30%) and Asia (25%) each of the three other continents includes 15% of Pteridophyta identified. The Gymnosperms are 53% from the Americas and only 10% are from Africa. Concerning the Monocotyledons, the species originated from Africa account for only 15% of the total. This percentage is 20% for dicotyledons. Among dicotyledons, the plants originating from the Americas include only 54% of the total.

Distribution of the Species according to decorative parts

Decorative Foliage Plants

In this study, 311 species grouped into 106 genera and 30 families are grown and used in Togo as ornamental decorative foliage plants. The most representative families are respectively *Arecaceae* with 18 genera and 22 species, and *Araceae* with 14 genera and 53 species, and *Acanthaceae* with 12 genera and 16 species and the *Euphorbiaceae* with 5 genera and 31 species.

Decorative look or decorative habit Plants

Twelve families including 34 genera and 69 species have ornamental architecture. The

following species are listed as an illustration: *Polyalthia longifolia* (Sonn.) Hook. f. & Thomson (*Annonaceae*) *Ravenala madagascariensis* Gmel. J.F. (*Strelitziaceae*) and *Terminalia mantaly* H. Perrier (*Combretaceae*)

Decorative flowering plants

It is about 166 species from 37 families of Monocotyledons and Dicotyledons. This is the case of *Allamanda cathartica* L. (*Apocynaceae*), *Gardenia jasminoides* Ellis (*Rubiaceae*), *Guaiacum officinale* L. (*Zygophyllaceae*), *Hibiscus rosa-sinensis* L. (*Malvaceae*), *Mussaenda philippica* A. Rich. (*Rubiaceae*) and *Plumbago capensis* Thunb. (*Plumbaginaceae*).

Fragrant plants

This category includes 9 species grown for the scent of their flowers, leaves and fruits. They are from 8 families (Table 2).

Ornamental plants with fruits

In the list of horticultural plants in Togo, three families are concerned. Each accounts 1 genus. The species concerned are *Cocos nucifera L.* (Arecaceae), L. *Crescentia cujete* (*Bignoniaceae*) and *Artocarpus altilis* (Parkinson) Fosberg (*Moraceae*).

Ornamental plants with the combination of decorative parts

Depending on the season, the characteristics previously described (foliage, habit/ look, flowering, fruit) can be combined to give the plant its ornamental or decorative appearance. It may be the foliage and flowers, the case of *Adenium obesum* (Forssk.) Roem & Schult. et *Plumeria rubra* L. both of them from the *Apocynaceae* family. We also have the flowers-habit/look association and this is the case of *Guaiacum officinale* L. (*Zygophyllaceae*). Finally, we note the association of foliage and inflorescences. This is the case of *Nyctaginaceae Bougainvillea glabra* Choisy *variegata* (bougainvillea with variegated leaves), the *Oleaceae Ligustrum ovalifolium* Hassk. (variegated privet) and the aquatic plant *Victoria regia* Lindl. (*Nymphaeaceae*).

Distribution of ornamental species according to their use

Curbs, walkways or paths plants

The inventory gives 35 species grouped into 17 families and 26 genera. There are generally decorative trees and shrubs by their leaves and look and seasonally by their inflorescences such as *Khaya senegalensis* and *Delonix regia*.

Outdoor garden plants

These are the trees, shrubs and herbs potted, installed outdoors or put in the ground on lawns or not. Isolated plants, lawns plants, bedding, ornamental or protective hedges, ground cover or coating plants and water decorative plants can also be distinguished.

Isolated plants: These are 49 species grouped in 34 genera belonging to 21 families. For a species to be planted alone in a garden, it must offer a spectacle of beauty either by its foliage (*Nerium oleander variegatum*) or by its look (*Araucaria excelsa* R. Br, *Cycas revoluta* Thunb.) or by its flowers (*Mussaenda philippica, Hibiscus rosa-sinensis Polianthes tuberosa* L.) or its fruits (*Crescentia cujete* L.).

Lawns Plants or ground cover: The *Poaceae* are mostly used in Togo as lawns plants. In alphabetical order, we have: *Chrysopogon aciculatus* (Retz.) Trin,

Cynodon dactylon Pers, *Paspalum distichum* L. *Stenotaphrum secundatum* (Walt.) Kuntze. *variegatum* and *Zoysia tenuifolia* Trin.

A part from lawns, other plants are used to cover non-grassed bare surfaces. These include creepers such as *Episcia cupreata* (Hook.) Hanst. (*Gesneriaceae*) or twining plants such as *Ipomoea quamoclit* (*Convolvulaceae*). Depending on the structure of the plant, some species are used as carpets; this is the case *Wedelia trilobata* (L.) Hitch. (*Asteraceae*) or in wall carpet as the case of *Ficus pumila* L. (*Moraceae*)

Bedding grown ornamental plants: These are 28 species grouped in 18 genera and 15 families. The commonly used species are *Acanthus mollis* L. *Barleria lupulina* Lindl. (*Acanthaceae*), *Canna generalis* L. H. Bailey (*Cannaceae*), *Lantana camara* L. (*Verbenaceae*), *Thunbergia erecta* (Benth.) T. Anders., *Turnera ulmifolia* L. (*Turneraceae*) and *Yucca aloifolia* L. (*Agavaceae*).

Ornamental hedges: These include 33 species of 18 genera. They are grouped into 14 families. The commonly appreciated species are *Clerodendrum inerme* (*Verbenaceae*) for its dense foliage; *Bougainvillea glabra* (*Nyctaginaceae*) for its purple flowers and its thorns; *Pithecellobium dulce* (*Fabaceae*) mainly for its thorns and its dense foliage when the plant is young and *Pereskia grandiflora* (*Acanthaceae*) for its thorns and ease of its cuttings pushing.

Water Ornamental Plants: In this category, two families are identified: the family of *Pontederiaceae* represented by *Eichhornia crassipes* (Mart.) Solms. and that of *Nymphaeaceae* with 4 genera *Euryale*, *Nelumbo*, *Nymphaea* and *Victoria*.

Indoor garden plants

House plants: These are species that fit inside houses and apartments: balconies, verandas, hallways or inside the offices. 193 species grouped in 44 genera and 17 families are identified as house plants. These cover the genera *Pteris* (*Adiantaceae*) *Asplenium* (*Aspleniaceae*) *Aglaonema*, *Alocasia*, *Caladium*, *Dieffenbachia*, *Monstera* and *Philodendron* (*Araceae*) *Schefflera* (*Araliaceae*), Oxalis (*Oxalidaceae*) and *Licuala*, *Kentia*, *Livistona* (*Arecaceae*).

Cut Flowers: Several species are grown in order to provide useful elements to the preparation of floral bouquets. These bouquets are placed in clay pots or glass jars for home decor. Among the species recorded and identified, we have the genera *Caesalpinia and Melia* for inflorescences *Alpinia*, *Anthurium*, *Aster*, *Chrysanthemum*, and *Polyanthes* and *Heliconia* for flowers; *Alpinia*, *Cordyline*, *Cycas*, *Dracaena*, *Maranta*, *Sansevieria* for the leaves and *Cyperus* for the stem and the leaves.

Ornamental plants for therapeutic purposes (Table 3)

Seventy-seven ornamental species belonging to 39 families were inventoried as medicinal plants. The most represented families in number of species are the *Apocynaceae* and *Fabaceae* (6 species), *Euphorbiaceae* and *Liliaceae* (5 species), the *Arecaceae* and *Verbenaceae* (4 species).

Therapeutic application field: The ethno botanical survey revealed that 49% of the identified species are used to heal the digestive system diseases and 17% for skin diseases. The treatment of visual, bone, urinary, auditory parts of the nervous system is represented by less than 7% (Figure 4).

Some species are used to treat many diseases and the use of others requires a combination with non ornamental plants.

Parts used: For about43% of the species, the leaves are the most solicited parts (Figure 5). They are followed by, in descending order, the association stem-leaves (27%), the underground parts, the bark, the flowers, the fruits and the entire plant.

Method of preparation and administration: The decoction is the most common method of preparation (47%). It is followed by the poultice (17%) and the bath (13%). The other methods (maceration, nature, fumigation, infusion, powder) represent 23% (Figure 6). Among the methods of administration, the most used is the oral absorption (82%).

Related uses of ornamental plants

Even though grown for their beauty, many ornamental plants present other utility features. The following categories are identified: plants for psycho-magical, feeding, plants used in cosmetics or in industry (Table 3) and toxic plants.

For food plants, fruit and leaves (*Eugenia malaccensis* L. *Gomphrena globosa* L.) are the most used parts while the wood is very useful as timber (*Gmelina arborea* Roxb.) in buildings (*Acacia auriculiformis L*.) and as firewood (*Cassia siamea* Lam.).

Concerning the human feeding, 15 plant species are identified while 3 others are reported for traditional cosmetics and 11 in the agro-food system, industrial cosmetics and wood industry (Table 2). The use of ornamental plants, in relation to the living environment, informs on the life and culture standard. In Togo, whatever the life standard of the population, the current trend is to have a plant in his place of residence (Radji et al., 2010) and more than 90% of the respondents believe that the contact with plants is beneficial for their well-being (Brethour et al., 2007; Watson, 2006; Waylen, 2006).

The plants are still the first tank of new drugs. Approximately 75% of drugs are from a plant and every year we experience the development of new drugs (Fleury, 2008). African countries have a long medical tradition and traditional know-how based on medicinal plants (Scherrer et al., 2005). About 80% of people in developing countries rely on traditional medicine for primary health care (Jiofack et al, 2009, 2010; CIB-UNESCO, 2010; Betti et Mbere, 2011; Dibong et al, 2011; Ngono et al., 2011) either by cultural tradition or owing to the lack of other alternatives including lack of access to conventional care or high cost of conventional drugs (Tabuti et al 2003; Okafor et Ham, 1999). The majority of medicinal species of this study are 49% used to treat diseases of the digestive system and 17% for the skin diseases. This is in line with the works of Mehdioui and Kahouadji (2007), which account respectively for the same cases, 50% and 15%.

The diversity of plant parts from which natural medicines are extracted is amazing. In addition to the leaves and flowers, we also use the sap (*Aloevera*), the bark (*Khaya senegalensis*), the seeds, the fruits, the wood (*Gaiacum officinale*), the walnut (*Cocosnucifera*), the stem, the resin, the straw, the tuber, the bulb and the roots (Chevallier, 1996). These parts are used raw, dried or filtered in "sodabi", local liquor (Radji et al., 2010). In this study, the leaves (43%) are in majority requested and it confirms the works of Mehdioui et Kahouadji (2007), Poffenberger et al., *in* Ouattara (2006).

Table.1 Fragrant plants

Fragrant plants		
Family	Taxa	Part exhaling gasoline
Annonaceae	*Cananga odorata* (Lam.) Hook. f. & Thoms.	Flowers
Agavaceae	*Polianthes tuberosa* L.	Flowers
Caesalpiniaceae	*Cynometra megalophylla* Harms	Leaves
Moraceae	*Artocarpus communis* J.R. & G. Forst	Fruits
Oleaceae	*Jasminum nitidum Skan*	Flowers
	Jasminum sambac Ait.	Flowers
Poaceae	*Cymbopogon citratus* (DC.) Stapf	Leaves
Rutaceae	*Murraya paniculata* (L.) Jacq.	Flowers

Table.2 Related uses of ornamental plants

Scientific name	Parts consumed	Products obtained
Food		
Artocarpus communis J.R. & G. Forst.	Fruit	
Caladium bicolor (Ait.) Vent.	leaves, bulb	
Chrysophyllum albidum G.Don	Fruit	
Citrus maxima; *C. sinensis*	fruit (pulp, juice), flowers	beverages, jams, flavoring; beekeeping
Cocos nucifera L.	Fruit	
Cycas revoluta Thunb.	Marrow	
Elaeis guineensis Jacq.	seed, sap	fermented beverages, alcohol, vegetable oils
Eugenia malaccensis L.	Fruit	
Gmelina arborea Roxb.	Leaves	food package
Gomphrena globosa L.	Leaves	
Mangifera indica L.	fruit (nature, dried or cooked)	jams, marmalades, jellies, compotes, alcohol
Pithecellobium dulce (Roxb.) Benth.	fruit (aril)	
Punica granatum L.	fruit (pulp)	jams
Samanea saman (Willd.) Merril.	Clove	
Terminalia cattapa L.	Almond	
Cosmetic		
Bixa orellana L.	Seed	dyestuff
Elaeis guineensis Jacq.	Fruit	palm kernel oil
Lawsonia inermis L.	leaves, flowers	dyestuff, tincture, perfume, toothpicks
Industrial		
Acacia auriculiformis L.	Wood	cabinetmaking
Azadirachta indica A. Juss.	wood, seeds, gum	softwood lumber, firewood and charcoal, oil, tincture, lubricants, disinfectants, cosmetics, insecticides

Cananga odorata (Lam.) Hook.f. & Thoms.	Flowers	Perfume
Cassia siamea Lam.	Wood	cabinetmaking, firewood, charcoal
Catharanthus roseus L.	leaves, flowers, fruits	drugs
Citrus maxima; C. sinensis	wood, branches	woodwork, turning and marquetry
Cocos nucifera L.	Fruit	vegetable oil consumption
Ealeis guineensis Jacq.	seed, fruit; stipe	palm kernel cake, construction, bridges, straw, fencing, brush
Gmelina arborea Roxb.	Wood	frames, poles, wood making, sculpture, crates, plywood, firewood, for matches
Lantana camara L.	Leaves	sandpaper to polish wood
Mangifera indica L.	green or dried fruit, wood	fuel, construction, tincture, black ink
Psycho-magic		
Aloe vera	Leaves	negative influences and household accidents protection
Bambusa vulgaris	trunk, leaves and stems powder	protection against negative energies, bad luck, brings luck and fortune
Croton zambesicus Müll Arg.	whole plant	protection, hunting evil spirits
Thevetia neriifolia Juss.	Fruit	ordeals, divinations

Table.3 Horticultural plants used in traditional medicine

Names of Taxa	Parts Used	Method of administration
Acacia auriculiformis	leaves, roots	decoction, infusion
Acacia nilotica	fruit, dried fruit powder, fibers, gum	extracts, decoction
Agave americana	heart of the plant, fresh leaves	dyeing
Allamanda cathartica	latex, leaves	
Allamanda neriifolia	leaves, roots, flowers, milky sap	
Aloe butneri	Leaf	
Aloe vera	leaves, sap, pulp, gel	gel, ointment
Alternanthera sessilis	leaves	poultice
Areca catechu	powder of dried nuts, leaves, roots, leaves malaria	hot leaf cluster
Aristolochia elegans	leaves, roots	infusion of leaves, roots decoction, ointment
Averrhoea carambola	leaves, fruit	infusion, decoction, sap
Azadirachta indica	barks of trees and roots, young growth, leaves, flowers, stem oil	tea leaves, leaves and barks decoction , dry leaves powder, oily lotion, leaves poultice, flowers, fruits

Bambusa vulgaris	leaves, stems	decoction
Borassus aethiopum	male inflorescences	extracts
Caesalpinia pulcherrima	leaves, bark, wood, flowers	infusion
Cananga odorata	Flowers, roots, entire plant	vegetable oil essential oil
Carica papaya	roots, leaves, flowers infusions, seeds, fresh latex, fruit	leaf decoctions, flowers infusions, crushed leaves, latex
Cassia alata	leaves, roots, ramules, seeds, flowers, wood, fruit	leaf powder, decoction, seeds pulp, macerated leaves, infusion of leaves and flowers
Cassia siamea	bark, branches, stems, seeds.	external use
Cassia sieberiana	root	decoction, infusion, bath
Catharanthus roseus	roots, leaves, flowers	decoction of leaves, crushed leaves, cocktail
Citrus limon	leaves, fruit (pulp), roots, stems and seeds flowers	decoction
Clitoria ternatea	seeds, roots, leaves, flowers with drops	of juice, decoction, powder
Cocos nucifera	fruit, roots, milk	decoction, fresh milk
Costus speciosus	roots	decoction
Crinum asiaticum	leaves	plaster
Crinum jagus	bulbs	
Croton zambesicus	shoots, leaves, bark, roots	decoction, infusion, bath
Cymbopogon citratus	leaves, entire plant	essential oil
Cynodon dactylon	entire plant, roots	decoction
Draceana fragans var. *massangeana*		
Elaeis guineensis	roots , sap, leaves (palm cabbage), fruit, stipe, shell	decoction, infusion, oil
Erythrina indica-picta	bark, seeds, leaves, roots	
Euphorbia tirucalli	roots, latex, branches	juice of boiled roots local uses
Ficus pumila	Leaves	
Gmelina arborea	roots, leaves, bark, fruit	infusion, decoction
Gomphrena globosa	leaves	infusion, decoction
Guayacum officinale	leaves, roots	decoction
Hibiscus rosa-sinensis	leaves, flowers	crushing leaves, decoction, infusion
Hippeastrum puniceum	bulbs	
Hura crepitans	seeds	

Jasminum sambac	Flowers, roots, flowers	sap of roots, crushing leaves, decoction
Jatropha multifida. / Adenoropium multifidum	leaves, fruits, seeds, latex	decoction, infusion
Jatropha podagrica	leaves, roots	crushing leaves, decoction, infusion
Kalanchoe pinnata	leaves	poultice
Lantana camara	leaves, roots, branches, flowers	infusion, decoction, crushing
Lawsonia inermis	entire plant, leaves, roots, bark, flowers	crushing, decoction, infusion, poultice (local use)
Mangifera indica	leaves, core, bark, sap, root, flowers	decoction of bark, leave, infusion
Melia azedarach	roots, leaves, fruits, flowers, roots bark, bark associated with fruit	in association with *Quisqualis indica* ou *Chenopodium ambrosioides* L. var. *anthelmicum*
Millettia thonningii	leaves	decoction
Murraya paniculata	leaves, stems	decoction, as toothpick
Nerium oleander	leaf, bark, flower,	powder
Ocimum basilicum	essential oil	use, bath
Ocimum gratissimum	entire plant, seeds	in soup, powder
Peperomia campylotropa	entire plant	in salad, raw
Peperomia obtusifolia	leaves	raw, infusion
Phyllanthus angustifolius	leaves, roots	infusion, local use
Pithecellobium dulce	bark, roots, leaves	decoction, toothpick, bath
Plumbago zeylanica	all plant	decoction
Plumeria rubra tricolor	bark, leaves	local use on contusion, decoction of leaves
Portulacca oleracea	seeds, leaves, entire plant	powder, decoction
Punica granatum L. florepleno	root (bark), flowers and fruits, fruit (peel, pulp), leaves	raw in drinks, decoction
Quisqualis indica	seeds, roots, fruits	
Ruellia tuberosa (R. clandestina)	entire plants, leaves, seeds, roots	decoction, infusion, tea
Setcreasea purpurea	leaf	juice
Spilanthes oleracea.	flower-heads only, leaves only, roots only, leaves and flower heads, entire plant	chewing, infusion, chewed and applied as a poultice
Strophanthus gratus	seeds	extracts
Tectona grandis	leaves, seeds, flowers	decoction

Terminalia cattapa	leaves, bark	infusion, decoction
Thevetia neriifolia	bark, latex, toxic seeds	
Thunbergia grandiflora	leaves	plaster
Thuja occidentalis	oil	skin
Zingiber zerumbet	rhizome	powder, juice, raw

Figure.1 Major cities surveyed

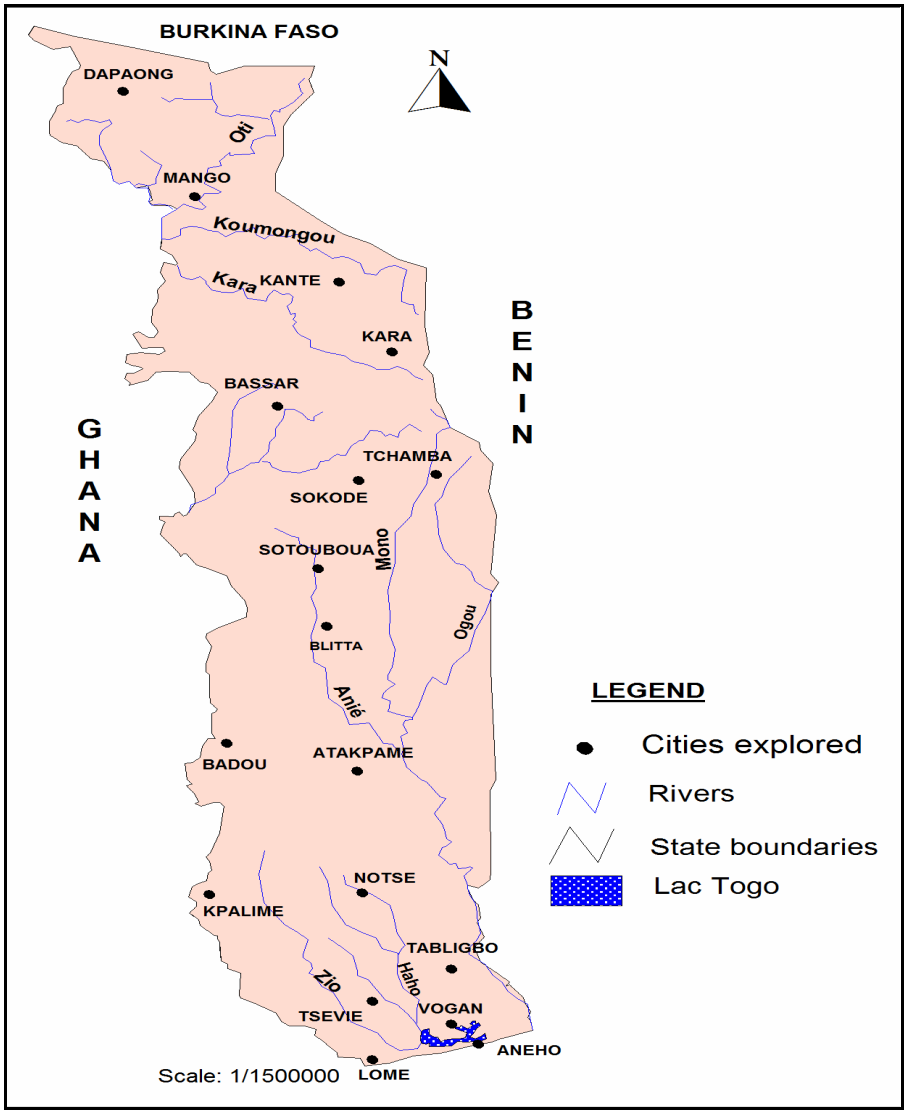


Figure.2 Relationship between floristic richness and age

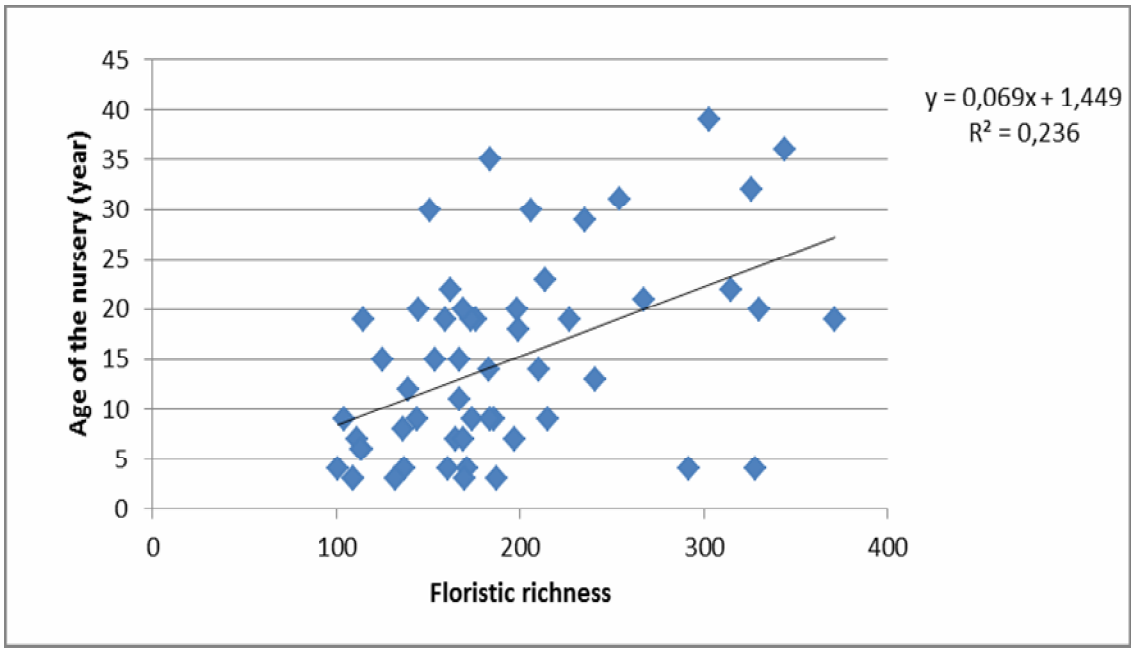


Figure.3 Origin of horticultural plants in Togo

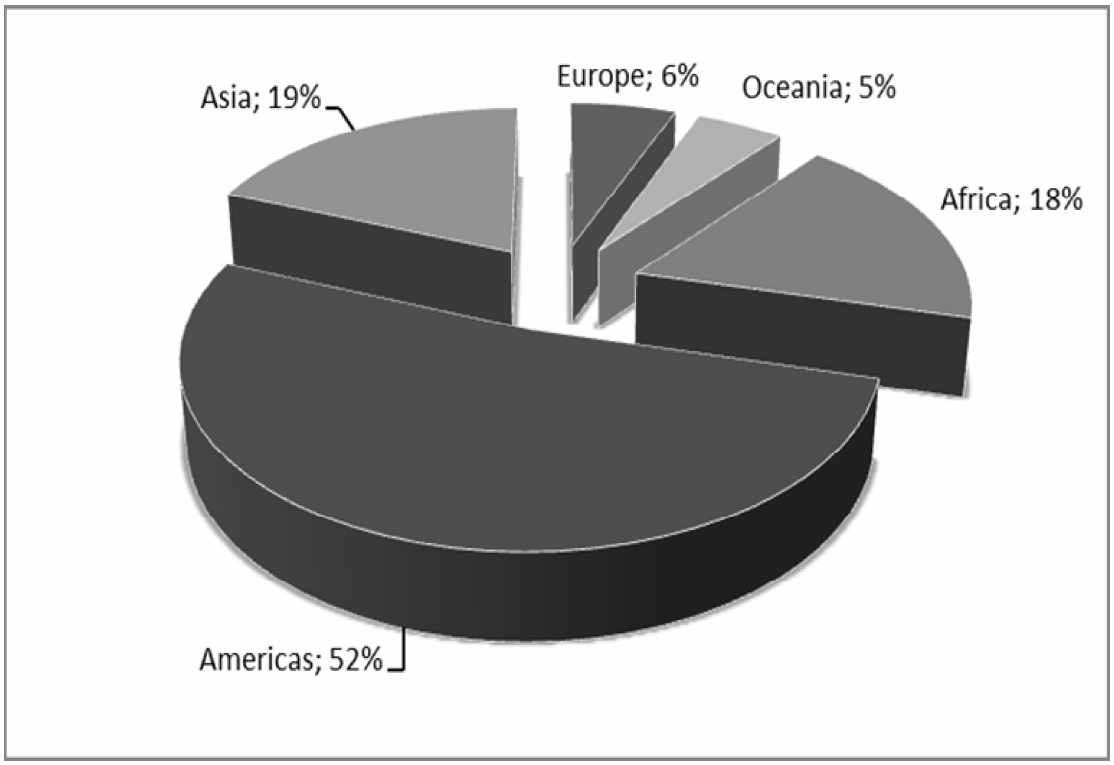


Figure.4 Distribution of the different uses of medicinal plants

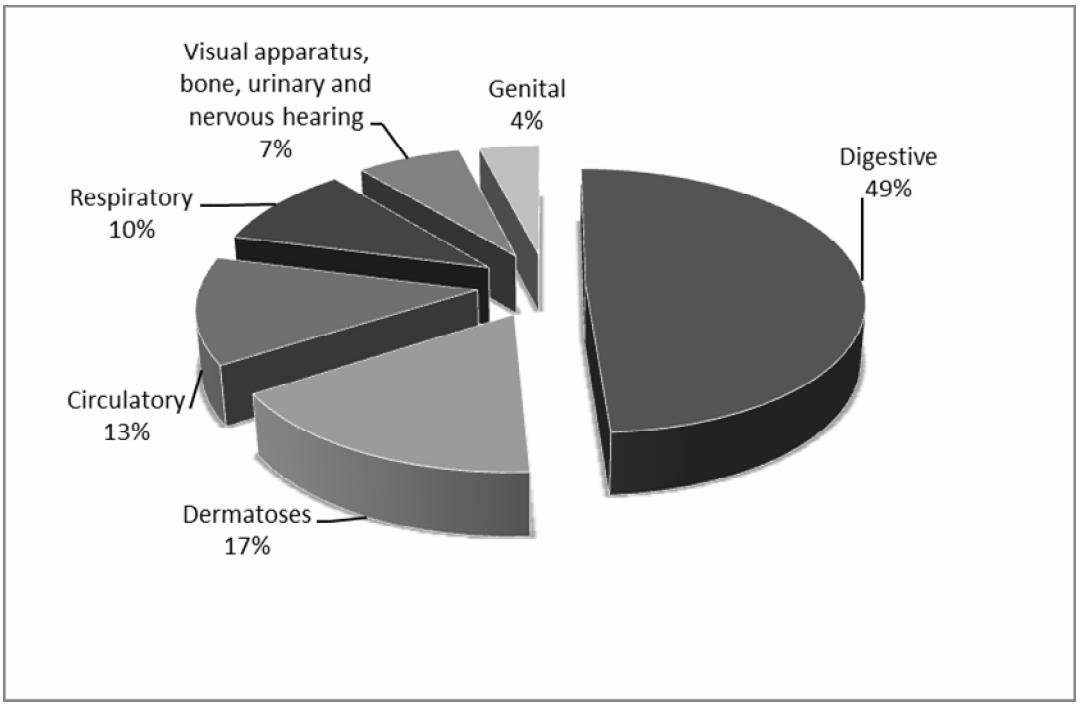


Figure.5 Distribution of plants different parts used

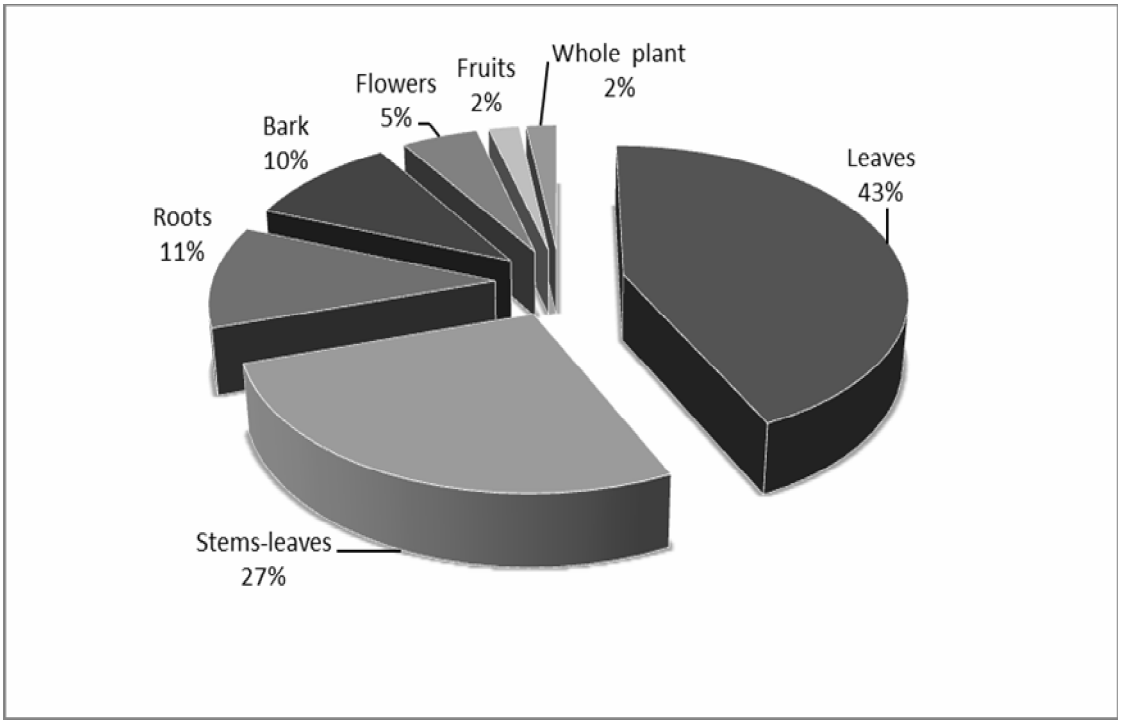
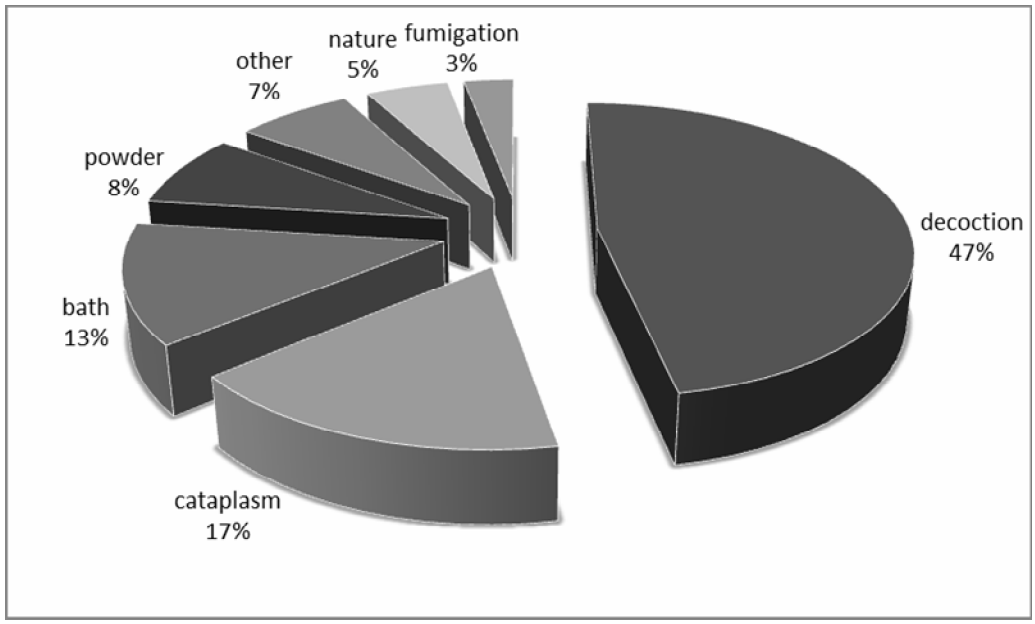


Figure.6 Spectrum of different methods of preparation of medicinal plants



If the value of 30% found by Mehdioui et Kahouadji (2007) appears to be less than 43% of these works, other authors have otherwise found percentages exceeding 60%. Poffenberger cited by Ouattara (2006) estimated that the sampling of 50% of tree leaves should not significantly affect its survival.

Furthermore, the mostly used preparation method in this study is the decoction (47%). This result very close to 42.30% set by N'Guessan et al. (2009) is equal to the 47% found by Mehdioui et Kahouadji (2007). With regard to the method of drug administration, oral absorption is requested at 82%. If this method is similarly reported in other studies, its value is far greater than that of N'Guessan et al. (2009) which report 48.97% and that of 32.35% established by Ouattara (2006).

Conclusion

In Togo, the horticultural flora is rich with 612 species, including 20 Pteridophytes, 17 Gymnosperms and 575 Angiosperms. The distribution of these species in major taxonomic groups indicates that the dicotyledons are mostly represented with preferential species of the *Rubiaceae* and *Annonaceae* families. Among the monocotyledons, the highly represented families are the *Araceae and Liliaceae*. These species are differently distributed according to the continents and over 82% are alien to Africa. They are classified according to the decorative parts and the parts of use. Depending on the presence or absence of these plants and their diversity in housing, a social stratification is possible. Among the species identified, 77 grouped into 39 botanical families are used as medicinal plants. The most representative families in terms of species richness are the *Apocynaceae*, *Fabaceae*, *Euphorbiaceae*, *Liliaceae*, *Arecaceae* and *Verbenaceae*. This study revealed that 49% of medicinal species recorded are used to treat the digestive system diseases and 17% to treat skin diseases.

The exploration of the plant world resources including horticultural plants remains valid.

The wild destruction of the forests deprives humanity from a vital source of material for the discovery of new molecules necessary for the development of future drugs. Plant production in ornamental horticulture, is it not a panacea for this destruction and in situ and ex situ a preservation of the overexploited species and a scenario of threats and even extinction.

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