ORIGINAL ARTICLE

Ethnobotanical survey of toxic plants and plant parts in Ogun State, Nigeria

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Background: Several plants considered toxic are sometimes identified in traditional medicinal recipes. This study identified and inventoried the plants and plant parts identified as toxic in targeted local government areas of Ogun State, Nigeria. **Materials and Methods:** By administering tested questionnaires, information on the poisonous or toxic plants, poisonous parts, poisonous effects, modes of poisoning, and antidotes was obtained. **Results and Conclusion:** Ninety-two species belonging to 43 families were identified as toxic plants and these were mainly members of the Euphorbiaceae and Fabaceae families. The botanical names, poisonous parts, common names, vernacular names, modes of poisoning, antidotes, and poisonous effects are presented in a table.

Key words: Inventory, poisonous plants, toxic

INTRODUCTION

Plants have been known to exhibit medicinal and poisonous properties in humans and animals. Poisonous or toxic plants produce chemical substances capable of causing harmful reactions in the body of humans and animals when taken in small or moderate quantities. The poisonous plants often cause adverse effects when ingested or when human beings come in contact with them. They affect the nervous system in various ways by stimulating or causing depression, tremors, convulsions, paralysis, and abnormal behaviour.[1]

Several reported cases of plant poisoning in humans are due to mistaken identity of the plant, eating the wrong part of edible plants, eating the plant in the wrong seasons, eating plants that are edible to some and poisonous to others, or eating too much of an edible plant which contains low level of toxins.

Though both medicinal and poisonous plants possess secondary metabolites such as cardiac glycosides, alkaloids, proteins, and amino acids,[2] they exhibit beneficial or adverse effects. The constituents in poisonous plants can affect the entire organ system. The effect often depends on the condition, growth stage, or part of the plant, and the amount consumed.[1]

Some of the plants used in folk medicine in treating human ailments and animal diseases are considered toxic. In plants, therapeutic effects often occur at lower doses, whereas overdose can induce poisoning.[1]

Several studies have identified biologically active compounds in poisonous plants.[3]

It is important to be aware of plants used for medicinal purposes that also have tendencies to cause poisoning in man and animals.

The aim of this study is to make an inventory of poisonous plants/plant parts identified in Ogun State, Nigeria.

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MATERIALS AND METHODS

Study Area

Ogun State is located between the latitudes of 4° 32′ and 5° 53′N and 7° 00′N and 3° 35′E with an estimated population of 4,054,272, and covers a total land area of 16,762 km^2 [Figure 1]. It shares a border with Oyo and Osun States to the north, Republic of Benin to the west, Ondo State to the east, and Lagos State to the south. The study areas are characterised by two main rocks with scattered hills that are interfluved between different river systems. The minimum and maximum temperature recorded varies from 24-30°C. The state enjoys a rainfall of about 1,000 mm in the western part

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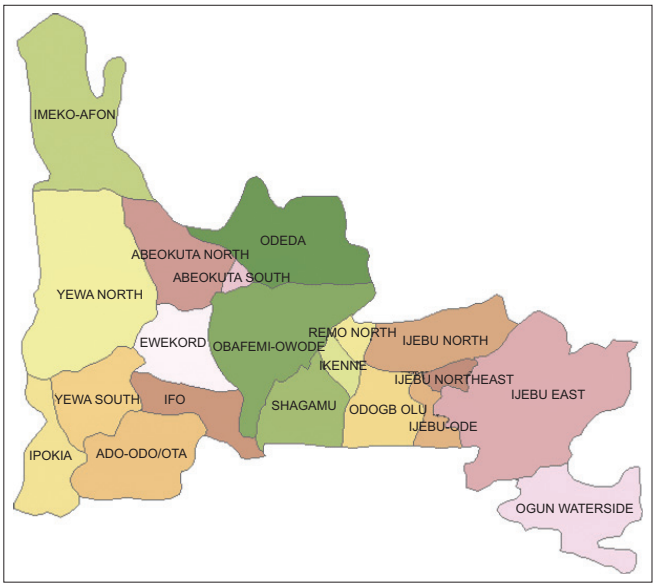

Figure 1: Map of Ogun State, Nigeria

and 2,000 mm in the eastern part. The study area has tropical rain forests with red and sandy soils. The study area has a federal medical center, a university teaching hospital, and several health centres and dispensaries.

Ethnobotanical Survey

The field study was conducted in the Ijebu and Egba areas of OgunState, Nigeria between February 2011 and March 2011 by administering a semistructured questionnaire by adopting the methods of Ajibesin *et al*. (2011).[4] The respondents were aged between 22 and 61 years. The questionnaires contained information on the vernacular name (s) of the poisonous or toxic plants, poisonous parts, poisonous effects, and modes of poisoning. Though the questionnaires were administered in the local language, the respondents had varying degrees of education; 21% had tertiary education, 37.8% secondary level of education, and 40.3% had primary education. The respondents were men and women in diverse professions (mainly traditional medical practitioners, old people, herb sellers, and other people with knowledge about plants), and the majority of them indicated that they obtained knowledge on poisonous and toxic plants from their ancestors and by training. Consent was obtained from every informant prior to the interview. The taxonomic identification of the collected plant samples was made by comparison with herbarium specimens and with established taxonomic literature. The common names (English) and botanical names were obtained from published reference materials and the plant database.[5-7]

The voucher specimens were deposited at the herbarium in the Department of Pharmacognosy, Faculty of Pharmacy, Olabisi Onabanjo University, Sagamu Campus.

RESULTS AND DISCUSSION

The plants listed in Table 1 were those identified and mentioned by at least three respondents. Ninety-two plant species belonging to 43 families were identified in this study. Of all the plant species identified as toxic or poisonous in this study, the parts mainly identified as toxic include the leaf (43.9%) and other parts such the sap/latex (14.3%), root (13.2%), and fruits (6.6%) Table 2.

Members of the Euphorbiaceae and Fabaceae families were mainly mentioned by the respondents as toxic plants. This could be because of the diversity of the species in these families.

Also, some of the toxic plants mentioned are used as food and for medicinal purposes. However, the morphological parts identified in the edible plants as toxic are not the parts consumed as food and these include *Colocasia esculenta, Ananas comosus, Vernonia amygdalina, Elaeis guineensis,* and *Talinum triangulare*, whereas some with toxic sap such as *Calotropis procera* is used traditionally in the northern part of Nigeria for the local production of cheese. This could be possible because of the quantity of the sap used or the presence of a low level of toxin.

However, the plants identified in this study mainly cause poisoning through consumption.

In addition, the fact that the plants identified as toxic are still being used in folk medicine for the treatment of diseases could be due to the therapeutic efficacy of such plants at a low dose but with a poisonous effect when an overdose of it is used.[1]

The poisonous effects of these identified toxic plants are death, inflammation, coagulation of blood, blindness, salivation, diarrhoea, gastrointestinal disorders (GIT), irritation, dermatitis, convulsions, and abortifacient effects.

In the folk medicine of Southwest Nigeria, palm oil is considered an antidote for the majority of human poisonings. In this study, majority of the respondents mentioned palm oil as an antidote for human poisoning if detected early. This is because in most African countries, the supernatant fluid of red palm oil is used as a natural antidote for many types of gastric drug poisonings.[8]

A comparison of this study with other similar reported studies on plant poisoning from other cultures (Southern African and Ethiopian) established a few similarities. These include *Lantana camara, Argemone* spp., *Jatropha curcas, Abrus precatorius, Ficus* spp., *Amaranthus* spp., *Euphorbia ingens, Manihot esculenta, Cannabis sativa, Kigelia africana,*

Table 1: List of poisonous plants

Family	Botanical name	Poisonous part	Common name	Vernacular name	Mode of poisoning	Poisonous effect	Voucher number
Amaranthaceae	*Aerva lanata* (L) Juss Ex. Schult	Leaf	Mountain knot grass	*Egusi aje*	Ingestion	Abortion; vomiting; death	PHS 236
Amaranthaceae	*Alternanthera repens* (L.) Link	Leaf	*Khaki* weed	*Dagunro*	Consumption	GIT disorder	HA 002
Amaranthaceae	*Amaranthus spinosus* L.	Leaf, stem	Spiny *amaranth*	*Tete elegun*	Ingestion	Stomach upset; bleeding	PHS 093
Amaranthaceae	*Cyathula prostrata* (Linn) Blume	Leaf	Pasture weed	*Sawerepe*	Consumption	Salivation	PHS 259
Anacardiaceae	*Anacardium occidentale* L	Seed	Cashew	*Kaju*	Ingestion	Burns; death	PHS 030
Anacardiaceae	*Lannea welwitschii* (Hiern) Engl	Leaf	Lannea/*Kumbi*	*Opon/Orira*	Ingestion	GIT	PHS 270
Apocynaceae	*Calotropis procera* (Aiton) W.T. Aiton	Leaf	Giant milk weed	*Bomubomu*	Consumption	Death	PHS 025
Apocynaceae	*Cerbera odollam* Gaertin	Sap	Suicide tree	*Kisopo*	Ingestion/ Contact	Burns	HA 010
Apocynaceae	*Funtumia elastica* (Preuss) Stapf	Latex	Lagos silk rubber; wild rubber tree	*Ako Ire*	Contact	Blindness	PHS 231
Apocynaceae	*Pleiocarpa pycnantha* (K. Schum) Stapf	Flower	*Pleiocarpa*	*Alatapara*	Contact	Blindness	HA 008
Apocynaceae	*Rauvolfia vomitoria* Afzel	Root, seed	Serpentwood	*Asofeyeje*	Ingestion	Stomach upset; vomiting	PHS 012
Apocynaceae	*Strophanthus sarmentosus* DC	Leaf	*Strophanthus*	*Sagere*	Ingestion	Diarrhoea	HA 006
Araceae	*Colocasia esculenta* (L.) Schott	Leaf	*Cocoyam*	*Ewe koko*	Contact	Itching	PHS 094
Arecaceae	*Elaeis guineensis* Jacq	Leaf	Oil palm tree	*Ope*	Consumption	GIT discomfort	PHS 250
Asteraceae	*Ageratum conyzoides* L	Leaf	Goat weed/tropical white weed	*Imisu*	Consumption	Stomach upset	PHS 131
Asteraceae	*Bidens pilosa* L	Spikes	Spanish needle/ hairy beggar ticks	*Abere oloko*	Contact	Wounds	PHS 237
Asteraceae	*Chromolaena odorata* (L) King H. Rob	Leaf	Jack-in-the-bush	*Akintola*	Consumption	Stomach upset	PHS 092
Asteraceae	*Synedrella nodiflora* (L.) Gaertn	Tuber	Node weed	*Tonoposo*	Consumption	Abdominal discomfort; wound	PHS 292
Asteraceae	*Tridax procumbens* L	Leaf	Coat buttons	*Muwagona*	Consumption	GIT	PHS 121
Asteraceae	*Vernonia amygdalina* Delile	Root	Bitter leaf	*Ewuro*	Consumption	Itching on the tongue	PHS 276
Asparagaceae	*Asparagus africana* Lam	Berries	Bush asparagus	*Aluki*	Consumption	GIT	HA 047
Bignoniaceae	*Kigelia Africana* (Lam) Benth	Stem	Sausage tree	*Pandoro*	Contact with fluid	Enlarged breast	PHS 233
Bignoniaceae	*Newbouldia laevis* Seem	Leaf, root	Tree of life/African border tree	*Ewe akoko*	Consumption	Stomach upset	HA 014
Bombaceae	*Ceiba pentandra* (L) Gaertn	Stem	Kapok tree	*Egungun*	Consumption	Unconsciousness	PHS 238
Boraginaceae	*Ehretia cymosa* Thonn	Fruit	Puzzle bush	*Jaloke/Jasoke*	Raw consumption	GIT discomfort	PHS 239
Bromeliaceae	*Ananas comosus* (L) Merr	Peel	Pineapple	*Ope oyinbo*	Consumption	Itching	PHA 345
Burseraceae	*Dacryodes edulius* (G.Don) H.J Lam	Bark	African pear/Bush butter tree	*Safou/Nsafu*	Consumption	Stomach upset	HA 17
Burseraceae	*Canarium schweinfurthi* Engl	leaf	Papo canary tree/ Schweinfurth's olive	*Awogbarun*	Consumption	Stomach upset	HA 018
Cannabaceae	*Cannabis sativa* L	Seed	*Marijuana*	*Igbo*	Consumption	Death	PHS 346
Cannaceae	*Canna indica* L	Fruit	Indian shot	*Ido*	Consumption	Abortifacient	PHS 321

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Table 1: Contd....

Family	Botanical name	Poisonous part	Common name	Vernacular name	Mode of poisoning	Poisonous effect	Voucher number
Capparaceae	*Euadenia trifoliata* (Schum and Thonn) Oliv	Leaf	*Euadenia*	*Ajinjingburigbu*	Consumption	GIT irritation, death	PHS 227
Colchicaceae	*Gloriosa superba* L	Berries/leaf	Flame family	*Moran/ Akalamagbo*	Contact	Itching/dermatitis	PHS 256
Cucurbitaceae	*Adenopus breviflorus* Benth	Fruit	Wild melon	*Itagiri/Tagiri*	Consumption	Death	PHS 245
Cucurbitaceae	*Citrullus colocythis* (L) Schrad	Fruit, sap	Colocynth/cow melon	*Egusi Bara*	Consumption	Nausea, vomiting	PHS 309
Cucurbitaceae	*Cucumis melo* L	Fruit; sap	Musk melon/ cantaloupe	*Baara -ekate*	Ingestion	Nausea; vomiting; diarrhoea	PHS 341
Cucurbitaceae	*Momordica charantia* L	Seed, root	Balsam pear	*Ejirin*	Consumption	GIT	PHS 242
Cucurbitaceae	*Zehneria capillacea* (Schumach) C. Jeffrey	Fruit	Bryony	*Luku*	Consumption	GIT	PHS 253
Cyperaceae	*Scleria depressa* (C.B.Clarke) Nelmes	Fruit	Sword grass/nut rush	*Labelabe*	Ingestion	Blood coagulation	PHS 286
Dioscoreaceae	*Dioscorea bulbifera* L.	Fruit	Air potato	*emina*	Ingestion	Inflammation	PHS 290
Dioscoreaceae	*Dioscorea dumetorum (Kunth) Pax*	Tuber	African bitter yam	*ogudugudu*	Ingestion	GIT discomfort	PHS 221
Dioscoreaceae	*Dioscorea praehensilis* Benth	Tuber	Bush yam	*Imisu*	Ingestion	GIT discomfort	PHS 243
Euphorbiaceae	*Cnidoscolus acontifolius* (Mill) I.M. Johnst	Leaf, sap	Chaya	*Iyanapaja*	Contact	Itching	PHS 268
Euphorbiaceae	*Croton penduliflorus* Hutch.	Seed, leaf	Turk's carp	*Aworoso*	Consumption	Death	PH 39
Euphorbiaceae	*Croton zambesicus* Mull Arg.	Leaf, seed	Bushveld	*Ewe ajekobale*	Consumption	Systemic disorder	HA 031
Euphorbiaceae	*Euphorbia deightonii* Croizat	Leaf, sap	Indian tree spurge	*Alagogo*	Consumption/ contact	Dermatitis; death	PHS 325
Euphorbiaceae	*Euphorbia hirta* L	Sap	Asthma weed	*Oro agogo*	Ingestion	Vomiting	PHS 274
Euphorbiaceae	*Euphorbia kamerunica* Pax	Latex	Spurge	*Igi oro*	Contact	Blindness; dermatitis	PHS 306
Euphorbiaceae	*Euphorbia lateriflora* (Schum and Thonn) Thonner	Root, sap	Little cactus	*Enupiri/Enuopiri*	Consumption	Death	PHS 241
Euphorbiaceae	*Euphorbia unispina* N.E.Br	Sap	Cactus	*Oro adete*	Consumption	Death	PHS 336
Euphorbiaceae	*Jatropha curcas* L	Leaf	Physic nut/ Barbados nut	*Lapalapa*	Consumption	Death	PHS 229
Euphorbiaceae	*Manihot utilissima* Pohl	Tuber, leaf	Cassava	*Ege pupa*	Raw consumption	Death	PHS 277
Euphorbiaceae	*Ricinus communis* Linn	Seed	Castor oil bean	*Eweka, Lara*	Consumption	Burns; bloody stool	HA 035
Euphorbiaceae	*Tetracarpidium conophorum* (Müell) Hutch. and Dalziel	Seed	Tetracarpidium	*Asala*	Consumption when not properly cooked	Death	PHS 265
Euphorbiaceae	*Tragia benthamii* Baker	Leaf	Tragia	*Esin*	Contact	Itching	PHA 339
Fabaceae	*Abrus precatorius* L	Leaf, seed	Love beans/prayer bead	*Oju ologbo*	Consumption	GIT discomfort	PHS 267
Fabaceae	*Dioclea reflexa* Hook.F	Leaf	Horse eye	*Dasa*	Consumption	GIT discomfort	PHS 342
Fabaceae	*Entada gigas* (L) Fawc.	Leaf, fruit	Sea heart/monkey ladder	*Ewe aagba*	Consumption	Death	PHS 255

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Table 1: Contd....

Family	Botanical name	Poisonous part	Common name	Vernacular name	Mode of poisoning	Poisonous effect	Voucher number
Fabaceae	*Erythrophleum suaveolens* (Guill. and Perr) Brenn	Leaf, stem, root, bark, seed	Sasswood	*Epo obo*	Consumption	Vomiting; diarrhoea; intestinal bleeding; death	PHS 327
Fabaceae	*Mimosa pudica* L.	Leaf	Shame plant	*Patanmo*	Contact		PHS 397
Fabaceae	*Mucuna pruriens* (L) DC.	Fruit	Velvet bean/ cowitch	*Ewe werepe*	Contact	Irritation; rashes	PHS 330
Fabaceae	*Mucuna sloanei* Fawc& Rendle	Sap	Seabeans/Horse eye beans	*Ina funfun*	Contact	Itching	PHS 329
Fabaceae	*Physostigma venenosum* Balf	Bark, seed	Calabar bean	*Epo obo*	Ingestion	Diarrhoea; vomiting; death	HA 043
Fabaceae	*Prosopis africana* Le	Seed	Ionwood	*Ayan*	Consumption	Death	HA 044
Fabaceae	*Senna hirsuta* L	Leaf	Hairy senna	*Asunwon*	Consumption	Diarrhoea	HA 019
Fabaceae	*Uraria picta* (Jacq) DC	Leaf	Dabra	*Aluparada*	Consumption	GIT; death	PHS 304
Loganiaceae	*Strychnos nux-vomica* L	Leaf	Strychnine tree	*Angboroko*	Ingestion	Death	PHA 343
Loranthaceae	*Agelanthus brunneus* (Engl.) Balle& Halle	Leaf	Mistletoe	*Igi ose*	Consumption	GIT	PHS 251
Malvaceae	*Abelmoschus esculentus* (L) Moench	Fruit, root	Okra/ladies finger	*Ila*	Consumption of raw fruit	Swollen mouth	PHA 344
Malvaceae	*Sida acuta Burm.* F.	Leaf	Horn bean leaf/ common wire weed	*Iseketu*	Consumption	GIT	PHS 324
Moraceae	*Antiaris toxicana* var Africana	Sap/latex	Poison arrow	*Igi oro*	Contact	Death/Irritation	PHS 285
Moraceae	*Ficus exasperata* Vahl	Leaf, root, sap	Sampaper plant	*Epin*	Contact/ consumption	GIT discomfort	PHS 261
Papaveraceae	*Argemone mexicana* Linn	Fruit, leaf	Mexican prickly poppy	*Mafowokan omo mi*	Consumption/ contact	Death; itching	PHS 282
Phyllanthaceae	*Hymenocardia acida* Tul	Leaf	Large red heart	*Orupa*	Ingestion	Death	PHS 263
Phyllanthaceae	*Phyllanthus amarus* Schumach and Thonn	Leaf, stem	Carry me seed	*Eyinolobe*	Contact	Itching	PHS 295
Phyllanthaceae	*Uapaca togoensis* Pax	Leaf	Peul	*Ipe*	Contact	Dermatitis	PHS 278
Piperaceae	*Piper guineesis Schum and Thonn*	Root	Climbing black pepper	*Iyere*	Consumption	Stomach ache; ulcer	HA 062
Plumbaginaceae	*Plumbago zeylanica* L.	Root, leaf	Ceylon leadwort/ wild leadwort	*Inabiri*	Consumption	Death	PHS 301
Poaceae	*Bambusa vulgaris* Schrad ex. J.C. Wendle	Leaf	Common bamboo	*Opaarun*	Ingestion	Abortion	PHS 213
Poaceae	*Zea mays* L	Stem, root	Corn/Maize	*Agbado*	Consumption	Death	PHS 240
Portulacaceae	*Talinum triangulare* (Jacq) Willd	Root	Water leaf	*Gbure*	Ingestion	Death	PHS 332
Rubiaceae	*Sarcocephalus latifolius* (Smith) Bruce	Leaf	African peach	*Egbesi*	Contact	Dermatitis	HA 066
Salicaceae	*Flacourtia indica* (Burm) Merr	Leaf	Governor's plum	*Osere*	Contact	Irritation	PHS 326
Sapindaceae	*Blighia sapida* K.D Koenig	Leaf	Ackee/Akee	*Ewe isin*	Contact	Irritation	PHS 212
Sapotaceae	*Chrysophyllum albidium* G	Unripe fruit	Cherry	*Agbalumo*	Ingestion	Stomach ache; upset	HA 069
Solanaceae	*Capsicum annum* L	Root	Chilli pepper/ sweet pepper	*Atarodo*	Ingestion	Death	PHS 317
Solanaceae	*Schwenkia americana* Linn	Leaf	Schwenkia	*Ewe-dandan*	Ingestion	Vomiting; diarrhoea	PHA 342

Contd....

Table 1: Contd....

Family	Botanical name	Poisonous part	Common name	Vernacular name	Mode of poisoning	Poisonous effect	Voucher number
Solanaceae	*Solanum dasyphyllum* Schumach and Thonn	Root	African egg plant	*Bobo awodi*	Ingestion	Death	PHS 252
Tiliaceae	*Corchorus olitorius* L	Root	Indian jute Plant	*Eewedu*	Consumption	Itching	PHS 320
Urticaceae	*Urera obovata Benth*	Leaf	Urera	*Esinsin agbonrin*	Consumption	Inflammation	PHS 249
Urticaceae	*Urtica dioica* L	Leaf	Stinging/common nettle	*Esinsin*	Consumption/ Contact	Inflammation	PHS 248
Verbenaceae	*Lantana camara* L	Leaf	Spanish flag/West Indian Lantana		Ingestion	Death	PHS 095
Violaceae	*Hybanthus enneaspermus* (L.) F.Muell	Leaf	Spade flower	*Abiwere*	Ingestion	Death	PHS 322

Table 2: Frequency of poisonous morphological parts

Morphological part	% frequency
Leaf	43.9
Seed	10.9
Sap/latex	14.3
Roots	13.2
Stem	3.3
Flowers	1.1
Fruit	6.6
Peel	1.1
Spikes	1.1
Tuber	3.3
Bark	1.1

Calotropis procera, Ageratum conyzoides, Zehneria spp., *Vernonia amygdalina,* and *Capsicum annum.*[1,9-12]

This study therefore provided an inventory of toxic plants in targeted areas of Ogun State, Nigeria for the purpose of informing, creating awareness, and exercising caution for those who use these plants for medicinal purposes.

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