

## **Ethnobotanical Importance and Phytochemical Analysis of Some Medicinal Plants Commonly Used As Herbal Remedies in Oye Local Government Area of Ekiti- State, Nigeria**

M.K. Olanipekun, J.Kayode and D. S. Akomolafe  
*Department of Plant Science, Ekiti State University, Ado Ekiti, Nigeria.*

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**Abstract:** Ten medicinal plants including *Aframomum leguata*, *Chromolaena odorata*, *Cissampelos owariensis*, *Pergularia daemia*, *Perquetinaniensis*, *Ocimum basilicum*, *Ocimum gratissimum*, *Tithonia diversifolia*, *Venonia amygdalina*, *Zingiber officinale* used for curing different ailments in the Oye Local Government area of Ekiti State, Nigeria were examined in this study. The contents of all the plants were found used for different types of ailments. The plants were found to contain alkaloids, saponin, tannins, phylobatanins, flavonoids, terpenoids and cardiac glycosides. Also the quantitative analysis was conducted to reveal amounts of phytochemicals in these plants. Results obtained revealed that ethnobotanical information obtained from these plants could constitute a baseline for the production of synthetic drugs from them.

**Key words:** Phytochemical analysis, medicinal plants, Oye Local Government area, southern Nigeria.

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### **I. Introduction**

The indigenous use of plants and plant materials has been from time immemorial. People from the rural areas relied absolutely on plants growing in the wild for the treatments of various diseases (Iwu, 2003). Also previous studies by Edeoga et al (2003, 2005) and Kayode et al; (2009) revealed that a wide variety of plants are known to be used as herbal remedies for the treatment of different diseases. Similarly Olanipekun (2011) asserted that various ailments treated with medicinal plants in Ekiti State, Nigeria include skin diseases, respiratory infections, diarrhoea, fever, wounds etc.

Herbs and plants are now known to contain minerals and vitamins that help body to resist diseases, strengthen tissues and improve the nervous systems. Plants such as *Aframomum leguata*, *Chromolaena odorata*, *Cissampelos owariensis*, *pergularia daemia*, *Perquetinaniensis*, *Ocimum basilicum*, *Ocimum gratissimum*, *Venonia amygdalina*, *Tithonia diversifolia*, and *Zingiber officinale* are being used extensively in herbal medicine in south-western Nigeria.

Research studies, such as those of Dingman (2002) and Mathew et. al.; (1999), had revealed that the extracts from medicinal plants species have different chemical composition that are essential for the physiological functions of human body, hence the plants have potential for use in treatment of different ailments and play important role in satisfying human needs for energy and life processes. Consequent on the above, the present study investigates ten medicinal plants used in the study area and document their phytochemical compositions.

### **II. Materials And Methods**

#### **Collection and identification of plant materials**

The fresh seeds and rhizomes of *Aframomum leguata* and *Zingiber officinale* respectively and the fresh leaves of *Chromolaena odorata*, *Cissampelos owariensis*, *Ocimum basilicum*, *Ocimum gratissimum*, *Perquetinaniensis*, *Pergularia daemia*, *Tithonia diversifolia* and *Venonia amygdalina* were randomly collected from selected villages in Oye Local Government Area of Ekiti State. The selected villages were Ayede, Ilupeju, Isan, Itaji and Omu-ijelu.

Recognizance surveys and visits were carried out in the villages selected in order to intimate the residents of the aims and objectives of the study and enlist their support for the study. In each of these villages, five respondents who have maintained continuous domicile in the villages for a period of not less than 20 years were chosen and interviewed with the aid of semi- structured questionnaire matrix. The interviews were conducted with a fairly open framework that allowed for focused, conversational and two-way communication.

Voucher specimens of the above stated plants were collected and were deposited at the herbarium of the Department of Plant Science, Ekiti-State University, Ado-Ekiti.

The medicinal uses of the plants were documented. Samples of the plants were air dried for two weeks, after which they were grounded into powder using a mechanical blender before being subjected to phytochemical screening. The phytochemical screening of the samples was carried out on the aqueous extract of

the powdered specimens using standard procedures to identify their chemicals constituents as described by Sofowora (1993), Trease and Evans (1989) and Harbone (1973) as follow:

#### **Test for Tannins**

0.5 g of the dried powdered samples was boiled in 20 ml of water, in a test-tube and then filtered. A few drops of 0.1 % Ferric chloride was added and observed. Brownish-green or blue-black colour indicates the presence of tannins.

#### **Test for Saponins**

2g of the powdered samples were boiled in 20ml of distilled water in a water bath and filtered. 10ml of the filtrate was mixed with 5ml of distilled water and shaken vigorously for a stable persistent froth. The frothing was mixed with three drops of olive oil and shaken vigorously and formation of emulsion was observed for the presence of saponin.

#### **Test for Flavonoids**

5ml of dilute ammonia were added to a portion of the aqueous filtrate of each of plant extract followed by addition of 2ml concentrated H<sub>2</sub>SO<sub>4</sub>. A yellow coloration observed in each extract indicated the presence of flavonoids.

#### **Test for Cardiac Glycosides**

5ml of each extracts was treated with 2ml of glacial acetic acid containing one drop of ferric chloride solution. This was underplayed with 1ml of concentrated sulphuric acid. A brown ring of the interface indicated a deoxysugar characteristic of cardenolides.

#### **Test for Alkaloids**

The method of Harbone (1973) was used in this test. 5g of the sample was weighed into a 250ml beaker and 200ml of 10 % acetic acid in ethanol was added and covered, and allowed to stand for 4hrs. This was filtered and the extract was concentrated on a water bath to one-quarter of the original volume. Concentrated ammonium hydroxide was added drop wise to the extract until the precipitation was complete. The whole solution was allowed to settle and the precipitate was collected and washed with dilute ammonium hydroxide and then filtered. The residue, which was the alkaloids, was dried and weighed.

#### **Test for Steroids**

2ml of acetic anhydride was added to 0.5 g of ethanol extract of each sample with 2ml H<sub>2</sub>SO<sub>4</sub>. The colour changed from violet to blue or green in some samples indicated the presence of steroids.

#### **Test for Terpenoids**

5ml of each extract was mixed in 2ml of chloroform and concentrated H<sub>2</sub>SO<sub>4</sub> and after which 3ml was carefully added to form a layer. A reddish brown coloration of the interface was formed to show positive result for the presence of terpenoids.

### **III. Results And Discussion**

The present study revealed the various medicinal uses of the identified botanicals in the study area. Table 1 shows that the seeds of *Aframomum meleguata* were used for the treatment of measles, diarrhoea, leprosy and its powder taken orally against excessive lactation while the rhizomes of *Zingiber officinale* was reported as being used for the treatment of diarrhoea, piles, asthma and cough. However, the leaves of the remaining botanicals were found to be used for various ailments ranging from the treatment of malaria fever, various aches, skin diseases, cough, scabies, cold and catarrh to liver disorder, rheumatism, jaundices and athlete foot.

**Table 1:** Traditional uses of the selected plants investigated

S/N	Botanical Name	Family Name	Local Name	Common Name	Part Used	Traditional Uses
1	<i>Aframomum meleguata</i>	Zingiberaceae	Ata-ire	Alligator pepper	Seeds	For treatment of measles, diarrhoea, leprosy, taken for excessive lactation
2	<i>Chromolaena odorata</i>	Asteraceae	Ewe-Akintola	Siam weeds	leaves	For treatment of diarrhoea, malaria, fever, toothache, the young leaves are squeezed and the liquid can be used to treat skin diseases, skin wound and dysentery.
3	<i>Cissampelos owariensis</i>	Asclepiadaceae	Ewe-	Velvet	Leaves	For treatments of diarrhoea,

			jokoje	leaf		dysentery, intestinal worms, wound dressing, scabies, ulcer, abscesses and worms etc.
4	Ocimumbascilicum	Lamiaceae	Efirin - wewe	Sweet basil	Leaves	For treatments of diarrhoea, cough, catarrh, cold, wound dressing convulsion and stomach pain etc.
5	Ocimumgratissimum	Lamiaceae	Efirin - nla	Mint/scant leaves	Leaves	For treatment of diarrhoea, cough, catarrh, cold, convulsion and stomach ache
6	Parquetinanigrensis	Periplocaceae	Ogbo	-	Leaves	For treatment of diarrhoea, wound dressing, jaundices etc.
7	Pergulariadaemia	Asclepiadaceae	Atufa	-	leaves	Leaf juice for treatment of infantile diarrhoea and also used to reduce body pain, extract is taken orally for menstrual complaints. Dried leaves are used as antiasthma, heal cut and hghwounds. Latex of the plant is used for boils and sores etc.
8	Tithornia diversifolia	Asteraceae	June 12	Sunflower	Leaves	For treatments of diarrhoea, athlete foot, jaundices, stomach upset etc.
9	Venonia amygdalina	Asteraceae	Ewuro	Bitter leaf	Leaves	For treatment of diarrhoea, cancer, fever, treat wounds, cough, toothache etc.
10	Zingiberofficinale	Zingiberaceae	Ata-ile pupa/ Ako	Ginger	Rhizomes	For treatment of diarrhoea, piles, asthma, cough etc.

The results of phytochemical compositions of the plants were summarised in Table 2. Alkaloids, tannins and flavonoids were found present in all the tested plants. Phylobatanins, steroids and cardiac glycosides were presents in all the species except in Ocimumbascilicum, Parquetinanigrensis, Tithoniadiversifolia, Venoniaamygdalina and Zingiberofficinale. Also cardiac glycosides and steroids were not discovered in Ocimumgratissimum, Pergulariadaemia and Zingiberofficinale .

Saponins was found present in all the plants except Aframomummeleguata, Chromolaenaodorata, OcimumbascilicumandPerquetinanigrensis while terpenoids were absent in all except in Cissampelousowariensis, Chromolaenaodorata and Tithoniadiversifolia.

The quantitative estimate of the distribution of crude phytochemicals in these medicinal plants studied is represented in Fig. 1. Pergulariadaemia had the highest percentage of crude alkaloids (7.048%) but lowest percentage of flavonoids (1.0 %) while Ocimumbascilicum had the lowest percentage of alkaloids (1.580 %). Similarly Zingiberofficinale had the highest percentage of saponin (35.5 %) while Cissampelosowariensis had the highest percentage of saponin (7.6 %). Similarly, Aframomummeleguata and Ocimumgratissimum had the same highest quantities of tannins (1.60 %).

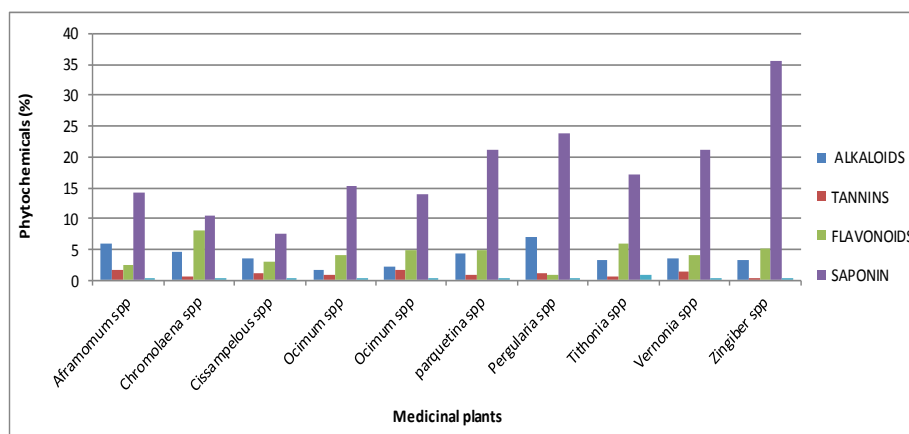
**Table 2:** Qualitative Analysis of the Phytochemical of the Medicinal plants

S / n	Medicinal Plants	Alkaloids	Tannins	Phylobatanins	Saponins	Flavonoids	Steroids	Terpenoids	Cardiac glycosides
1	Aframomummeleguata	+	+	+	-	+	+	-	+
2	Chromolaenaodorata	+	+	+	-	+	+	+	+
3	Cissampelousowariensis	+	+	+	+	+	+	+	+
4	Ocimumbascilicum	+	+	-	-	+	+	-	+
5	Ocimumgratissimum	+	+	+	+	+	-	-	-
6	Parquetinanigrensis	+	+	-	-	+	+	-	-
7	Pergulariadaemia	+	+	+	+	+	-	-	-
8	Tithoniadiversifolia	+	+	-	+	+	+	+	+
9	Venoniaamygdalina	+	+	-	+	+	+	-	-
10	Zingiberofficinale	+	+	-	+	+	-	-	-

**Key:** (+) signifies presence of the phytochemicals. (-) signifies absence of the phytochemicals.

The presence of alkaloids, tannins and flavonoids on the seeds of *Aframomum melegueta*, rhizomes of *Zingiber officinale* and the leaves of the remaining eight plant species agreed with the findings of Sofowora (1993), Trease and Evans (1989), Otoide and Kayode (2011). Results from the study revealed that *Aframomum* species contained all the metabolites except saponin and terpenoids. The presence of flavonoids in all the botanicals also support the findings of Edeoga et al; (2006) who had earlier reported that *Ocimum basilicum* extracts possessed antimicrobial activities and also the study of Gill (1992) who opined that *Ocimum gratissimum* leaves are useful in the treatment of catarrh, cough, and diarrhoea and chest pain. Similarly, Otoide and Kayode (2011), they reported that these plants, as well as *Chromolaena odorata*, are widely used in herbal medicine to treat different ailments.

The total amounts of phytochemicals in these plants are shown in Fig 1. The species were observed to be rich in alkaloids, tannins, flavonoids saponins thus suggesting their suitability for use as starting materials for the production of synthetic drugs.



**Fig 1.** Quantitative analysis of medicinal plants

### References

- [1]. Dingman.S.L. (2002).Water in soils.Infiltration and redistribution. Physical hydrology, second edition, Upper saddle river, New Jersey: Prentice – Hall, Inc. P. 646.
- [2]. Edeoga.H.O, Okwe.D.E; Mbaebie.B.O (2003). Mineral and Nutritive values of some Nigerian Medicinal Plants J. med. Aromatic plant Science. 25: 1010-1015.
- [3]. Edeoga.H.O, Okwe.D.E; Mbaebie.B.O (2005).Phytochemical constituents of some Nigerian medicinal plants. Afr. J. Biotechol. Vol. 4(7): 685-688.
- [4]. Kayode, J; Olanipekun, M.K. and Tedela P.O. (2009).Medicobooanical studies in relation to veterinary medicine in Ekiti-State, Nigeria. Checklist of botanicals used in treating poultry diseases,Ethnobotanicalleafflets. 13. USA
- [5]. Gill, L.S. (1992): Ethno medicinal uses of plants in Nigeria. University of Benin Press. 350P
- [6]. Harbone.J.B (1973). Phytochemical methods: A guide to modern technique of plant analysis. Chapman and Hall, New York.
- [7]. Iwu.M. (2003). Handbook of African medical plants. CRC Press, BOCA Ration , F.L.
- [8]. Matthews.C.E, Van Holde. K. E., Ahem. K.G. (1999).Biochemistry.(3<sup>rd</sup>edn.) Benjamin Cummings.
- [9]. Olanipekun.M.k. (2011).Studies on Ethnoveterinary Botanicals and Some Aspect of Conservation in Ekiti-State, Nigeria.EKSU. Ph.D. Project.
- [10]. Otoide.J.E. and Kayode.J .(2011) phytochemical study of some plants commonly used as herbal remedies in Southern Nigeria. Bulletin of pure and Applied Sciences. Vol. 30B- Botany(No. 1-2) 2011. P. 33-40.
- [11]. Trease, G.E. and Evans, W.C. (1989).Pharmacognosy.11thEdn. BrailliarTiridel Can.Macmillian Publishers.