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The *in vitro* phytochemical investigation on five medicinal plants in Anyigba and its environs, Kogi State, Nigeria

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ABSTRACT

Traditionally, man has been using plants for health care. The developing countries mostly rely on traditional medicines which involves the use of different plant extracts. These extracts contain many molecules or bioactive constituents which serve as alternative to chemical toxicants in plant and above all, provide the health application at a affordable cost. This study keenly represents one of the best avenues in searching new economic plants for medicine. In keeping this view in mind the present investigation is carried out on the bioactive and phytochemical properties of Bitter leaf (Vernonia amygdalina), Mango (Mangifera indica), Neam (Azadirachta indica), Paw-Paw (Carica papaya) and Tobacco (Nicotiana tabacum) were investigated.

Keywords: Phytochemical, compounds, traditional medicine, methanol, extracts.

INTRODUCTION

The word “Phyto” is the Greed word for plant. Phytochemicals, which not only that they are non-nutritive plant chemicals that have protective or disease preventive properties but also protect human from a host of diseases. The study of medicinal plants used in folklore remedies in the treatment of microbial infections have attracted the attention of many scientists on possible alternatives to the existing drugs to which many infectious microorganisms have become resistant **[1]**. Presently, there are global problem of multiple antibiotics resistance as well as emergence of new and resurrection of previously eradicated diseases **[5]**, and **[1]**. These phytochemicals being produced by plant are equally being used by plant to protect it. The increasing cost of importation of chemicals (fungicides) also causes serious drains on the economy of most developing countries. Most farmers have limited resources and lack the technical expertise required to handle imported fungicides and pesticides which have the disadvantage of being denatured under high tropical temperatures which results due to long storage and delayed importation. There is need to search for new and more potent antimicrobial compounds of natural origin to complement the existing synthetic antimicrobial drugs that are gradually becoming less potent against pathogenic microorganisms and the development of ecologically sustainable fungi management strategies which will be effective against target species but create minimal adversity for non-target species.

Historical successes recorded in the use of *Azadirachtin* from neem plant, nicotine from tobacco and pyrethrin from chrysanthellum flowers (*Chrysanthellum indicum*) as bio-pesticides and fungicides have spurred scientists to search for alkaloids, flavonoids, terpenoids and other secondary compounds, which the plants have evolved over the years for protecting themselves against damage by pests. These naturally occurring compounds when used in formulations singly or in combinations on bio-pesticides have proved effective, environmentally safe, and easily biodegradable **[6]**. Pawpaw is a medicinal plant, whose parts were pharmacologically proved to possess bioactive components, effective for disease control **[7]**. The study therefore focused on the phytochemical screening of these plants.

MATERIALS AND METHODS

Plant Materials

The fully matured leaves were collected from the fields of Anyigba, Egume, Ojipadala and Ejule. They were authenticated at the Herbarium of Biological Sciences Department, Kogi State University, Anyigba, Nigeria.

Preparation of Plant Extract

Exactly 1000g of the powdered leaves were soaked separately in mixture of methanol and sterile distilled water in ratio 3:2 and having soaked for four days, were heated to 100^0c for 30 minutes for hot organic solvent extraction according to **[2].** The filtrates concentrated using the vacuum evaporator so as to regenerate the methanol. Filtered using Buckner funnel and dried solidified extracts weighed to be 200g.

Phytochemical Screening Test for the Extracts

A small portion of the dry extracts were subjected to the phytochemical test using **[3]** methods to test for alkaloids, tannins, steroids, terpenoids, reducing sugar, saponins, flavonoids and glycosides.

Test for alkaloids

About 0.2g extract warmed with 2% H_2SO_4 for two minutes, filtered and few drops of dragendoffs reagent added orange red precipitate indicates the presence of alkaloids.

Test for tannins

Small quantity of extracts mixed with water, heated, filtered and ferric chloride added. A dark green solution indicates the presence of tannins.

Test for steroids

Exactly 2ml of acetic anhydride added to 0.5g of the extracts with 2ml of H_2SO_4. The colour changes from violet to blue or green in some samples indicating the presence of steroids.

Test for terpenoids

About 0.2g extracts was mixed with 2ml chloroform ($CHCl_3$) and concentrated H_2SO_4 (3ml) was carefully added to form a layer. A reddish brown coloration of the interface formed indicating the presence of terpenoids.

Test for reducing sugar

The extracts shaken with distilled water and filtered. The filterate boiled with Fehling's solution A and B. an orange and red precipitate indicates the presence of reducing sugar.

Test for saponins
About 0.2g of the extracts shaken with 5ml of distilled water and then heated to boil frothing (appearance of creamy mix of small bubbles) shows the presence of saponins.

Test for flavonoids
Extract of about 0.2g dissolved in diluted NaOH and HCl added. A yellow solution that turns colourless indicates the presence of flavonoids.

Test for glycosides
The extracts hydrolyzed with HCl solutions and neutralized with NaOH solutions. A few drops of Fehling solution A and B were added. Red precipitate indicates the presence of glycosid

RESULTS

The result obtained in the present investigation **(Table 1),** the hot methanolic extraction of the leaves of bitter-leaf, mango, neem, paw-paw and tobacco showed that these plants possess antimicrobial activities.

Table 1: The Analysis of Phytochemcials in the Hot Organic Methanolic Extraction of the Extracts

Phytochemicals	Inference				
	Bitter-leaf	Mango	Neem	Pawpaw	Tobacco
Alkaloids	–	+	–	+	+
Tannins	–	+	+	+	+
Steroids	+	–	+	+	+
Terpenoids	–	+	+	+	+
Reducing sugar	–	+	+	–	+
Saponins	+	+	+	–	+
Flavonoids	–	+	+	+	+
Glycosides	+	+	–	+	–

+ = Presence, – = absence

DISCUSSION

A variety of herbs, shrubs and trees contain different phytochemicals with biological activity that can be of valuable importance. Much of the protective effect of fruits and vegetables could be attributed to some phytochemicals compounds they possess. The phytochemicals analysis of the extracts of these plants revealed the presence of alkaloids, tannins, steroids, terpenoids, reducing sugar, saponins, flavonoids and glycosides **(Table 1).** These phytochemcial compounds are known to play important roles in bioactivity of medicinal plants**. [1]**, reported the medicinal values of medicinal plants lies in these phytochemical compounds and as such produce a definite physiological action on the human body. Saxena, **[6]** also reported these phytocemical compounds being bioactive, easily biodegradable and of narrow-spectrum activity against plant diseases. The anti-inflammatory effects of alkaloids and flavonoids were reported by **[4]**. The effectiveness of glycosides in the treatment of congestive heart failure was reported by **[8]**; while tannins and steroids were found to be used in the treatment of inflamed or ulcerated tissues.

CONCLUSION

Phytochemical screening of these plants revealed that the crude extracts contained alkaloids, tannins, steroids, terpenoids, reducing sugar, saponins, flavonoids and glycosides and can also

have various medicinal values, such as anti-inflammatory, anti-diabetic and analgesic activities, which could be harnessed for optimum uses as an alternative to modern medicines and chemicals.

REFERENCES

[1] Adegboye, MF., Akinpelu, DA. and Okoh, AI. *African Journal of Biotechnology* **2008**, 7(21): 3934 – 3938.
[2] Chiejina, NV. *Nigerian Journal of plant protection*. **2005**, 22: 172 – 179.
[3] Harbourne, JB Phytochemical Methods. A Guide to Modern Technique of Plant Analysis. Chapman and Hall, London, **1983**.
[4] Hodek, P. Tretil P, Stiborova, A. *Chemico – Biological interactions* **2002**, 139: 1 – 21.
[5] Iwu, M.M. *Handbook of African Medicinal Plants*. Boca Raton: CRC Press Inc. pp **1993**, 223 – 224.
[6] Saxena, R.C. Insecticides from Neem In: Insecticides of Plant Origin. American chemical society, Washington DC USA, **1989**, pp 110 – 135.
[7] Wokocha, RC. and Okereke, VC. *Nigerian Journal of Plant Protection.* **2005**, 22:106-110.
[8] Yakari, I. Youichi, F., Ikuko, N and Itsuru, Y. *Journal of Natural Product*. **1995**, 58 (60): 897 – 90*9300.1.