RESEARCH ARTICLE

PHYTOCHEMICAL ANALYSIS OF A TRADITIONAL MEDICINAL FORMULATION USED AS MEDICINE IN SOKOTO, NIGERIA

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ARTICLE INFO	ABSTRACT
	The phytochemical analysis of a traditional medicinal formulation also called "komi da ruwanka" used in the treatment of diseases was carried out. The screening of the formulations from all the locations revealed the presence of alkaloids, saponins, cardiac glycosides, flavonoids, steroids and volatile oils.

INTRODUCTION

Over the years, alternative medicine has maintained its popularity in all regions of the world and it's use is rapidly spreading in industrialized countries. The term alternative medicine is generally used to describe practices used independently or in place of conventional medicine (Eisenberg, 1998). Traditional medicine is the most common system of alternative medicine in developing countries with herbal medicine being the most sought after .According to the World Health Organization (WHO, 2000) traditional medicine is the sum total of the knowledge, skills and practices based on theories, beliefs and experiences indigenous to different cultures used in the maintenance of health as well as in prevention, diagnosis, improvement or treatment of physical and mental illnesses (Ernst, 1998).

In the last two decades, there has been an upsurge in the circulation and usage of traditional medicinal preparations in the treatment and or prevention of diseases in Nigeria (Oyetayo, 2008). This may not be unconnected with the relatively high cost of conventional pharmaceutical drugs, inaccessibility of orthodox medical services to a vast majority of people particularly in the rural areas, prevalence of fake, substandard or counterfeit drugs in the market and the problem of antibiotic resistance which is very common in developing countries (Adenike *et al.,* 2007).

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MATERIALS AND METHODS

Collection of samples

Samples of the popular traditional medicinal preparation were bought randomly from traditional drug vendors in Sokoto. A total of three samples were gotten and the bottles of the samples were labeled SL_1, SL_2, SL_3 and transported to the Biochemistry laboratory of Usmanu Danfodiyo University, Sokoto for phtytochemical screening.

Phytochemical screening

Test for Alkaloids

About 2ml of the sample was mixed by stirring with 2ml of 10% aqueous hydrochloric acid on a steam bath. It was allowed to cool and then filtered. 1ml of the filtrate was treated separately with Mayer's reagent and another 1ml with Wagner's reagent. A deep brown creamy precipitate indicated a positive test (Harbone, 1993).

Test for Flavonoids

1ml of the sample was dissolved in sodium hydroxide solution. The appearance of a yellow solution which disappeared on addition of hydrochloric acid indicated the presence of flavonoids (Harbone, 1993).

Test for Cardiac glycosides (Keller-Killiani Test)

To 1ml of the sample, 2ml of 3.5 ferric chloride solution was added and was allowed to stand for one minute.1ml of

concentrated H_2SO_4 was carefully poured down the wall of the tube so as to form a lower layer. A reddish brown ring at the interface with the upper layer turning greenish- blue indicated the presence of cardiac glycosides (Harbone, 1993).

Test for Tannins

Ferric chloride solution was added drop wise to 2ml of the sample and the color produced was noted. Condensed tannins usually produce a dark green color, while hydrolysable tannins produce blue-black color (Harbone, 1993).

Test for Steroids

This was carried out according to the method of Harbone (1993).To 1ml of the sample; 2ml of chloroform was added. Then 2ml of sulphuric was added carefully to form a lower layer. A reddish brown color at the interface indicated the presence of a steroidal ring.

Test for Saponins

5ml of the sample was poured in a test tube and then 5ml of distilled water was added and then shook vigorously for 2 minutes. The presence of frothing that lasted several minutes indicated the presence of saponins (Harbone, 1993).

Test for glycosides

2.5ml of 50%H_2SO_4 was added to 1ml of the sample in a test tube. The mixture was heated in boiling water for 15 minutes and 5ml of Fehling's solution was added and the mixture was boiled. A brick- red precipitate indicated the presence of glycosides (Harbone, 1993).

Test for volatile oils

A small quantity of the sample was shaken with dilute hydrochloric acid .A white precipitate indicated the presence of volatile oils (Harbone, 1993).

RESULTS

The results of phytochemical screening of the samples are shown in Table 1. Volatile oils, alkaloids, saponin glycosides and steroids are the most common constituents found in all the samples. Other constituents detected are glycosides, flavonoids and cardiac glycosides. Tannin was not detected in all the samples.

Table 1. Phytochemical analysis of samples SL$_1$, SL$_2$ and SL$_3$

Compounds	Samples		
	SL$_2$	SL$_2$	SL$_3$
Tannins	ND	ND	ND
flavonoids	+	ND	+
Saponins	ND	ND	ND
Alkaloids	+++	+++	+++
Saponin glycoside	+++	ND	+++
Cardiac glycoside	ND	++	ND
Volatile oils	++	++	++
Steroids	++	+++	++
Glycosides	+	+	−

Key:
-   = Compound absent
+   = Present in trace amount
++ = Present in moderate amount
+++ = Present in large amount
ND = Not detected
SL$_1$ =Sample from location, SL$_2$=Sample from location 2, SL$_3$=Sample from location 3

DISCUSSION

The presence of phytochemicals in the formulation studied is a function of their antimicrobial activities as they play important roles in bioactivity of medicinal plants (Amin et al., 2013). Phytochemicals exert antimicrobial activity through different mechanisms; alkaloids for example, have been associated with medicinal uses for centuries (Mensah, 2008). One of the most common biological properties of alkaloids is their toxicity against cells of foreign organisms (Schardl et al., 2002). Saponins have been extensively used as detergents, piscicides and molluscides. Saponins are also used industrially as foaming and surface active agents (Okwu, 2007). Flavonoids are hydrated phenolic substances known to be synthesized by plants in response to microbial infection and they have been found to be active against many microorganisms invitro (Kubmarawa, 2007). Steroids are also compounds of importance as they are associated with hormones responsible for secondary sexual characteristics (Ghani, 1999). Steroids are also responsible for central nervous activity. Many reports show that glycosides lower blood pressure (Joseph, 2002).

Conclusion

The traditional medicinal formulation screened for phytochemical constituents seemed to have the potential to act as a medicine which can be used to improve the health status of consumers. Extensive research is therefore required to find out the mechanisms of action as well as bioactivity of the various constituents.

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