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PRELIMINARY PHYTOCHEMICAL SCREENING OF *Balanites aegyptiaca* (leaves) AND *Citrus Sinensis* (peel)

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Abstract

Balanites aegyptiaca (leaves) and citrus sinensis (peel) where used in this study. The finely powdered from each species was percolated with ethanol. The crude extract (F_1) were macerated using petroleum ether (F_2), n-hexane (F_3), ethyl acetate (F_4), chloroform (F_5) and methanol (F_6). The phytochemical analysis of various fractions obtained from B. aegyptiaca (leaves) and C. sinensis (peel) revealed the presence of alkaloids, flavonoids, tannins and steroids. The phytochemicals generated data from the five different extracts of B. aegyptiaca (leaves) and C. sinensis (peel) may be used as tools for quality control and healing of diversity of diseases conditions.

Keywords; Phytochemical screening, *Balanites aegyptiaca, Citrus sinensis,* and Extract.

Introduction

Medicinal plants are of great importance to the health of individuals and communities. The medicinal value of these plants lies in some chemical substances that produce a definite physiological action on the human body and these chemical substances are called phytochemicals. Phytochemical constituents are the basic source for the establishment of several pharmaceutical industries. The constituent presents in the plants play a significant role in the identification of crude drug. Phytochemical analysis is very important in identifying new sources of therapeutically and industrially important compounds like alkaloids, flavonoids, tannins and steroids. [1]

Balanites aegyptiaca (desert date), belong to the family *Zygophyllaceae*, it is an edible, reaches 10m (33ft) in height with a generally narrow form. The branches have long, straight green spines arranged in spirals. The dark green compound leaves grow out of the base of the spines and are made up of two leaflets which are variable in sizes and shapes. It is widely grown in the Sudan Sahelian region of Africa, the middle east, source Asia and Nigeria. [11] Various part of *B. aegyptiaca*

have their own medicinal properties. This plant has been reported to be purgatives, vernifuge, ferbrifuge and can also cure other types of ailments like skin boil, leucoderma, malaria, liver and sleeping disorder. [8]

Citrus sinensis (sweet orange) is a small tree and has grayish brow bark. The sweet orange tree bears evergreen leaves that are oval shape and grows alternatively to a length of three to four inches. [6] It is originated in south Asia. It is widely grown in some part of African and European countries e.g. Nigeria.[3] The various parts of *C. sinensis* have many medicinal uses. The peel of the fruit is used locally as hand cleaning agent and d-limonene which consist 90% of *C. sinensis* oil served as anti-cancer tool in humans. [9] It is in view of these pharmacological properties of the plants that this paper aims to carry out preliminary qualitative phytochemical analysis of *B. aegyptiaca* (leaves) and *C. sinensis* (peel) using ethanol, petroleum ether, n-hexane, ethyl acetate, chloroform and methanol extracts.

Materials and Methods

The materials used include apparatus/glass wares, equipment and reagents. The chemicals used were of analytical grade.

Collection and Identification of Plant Samples

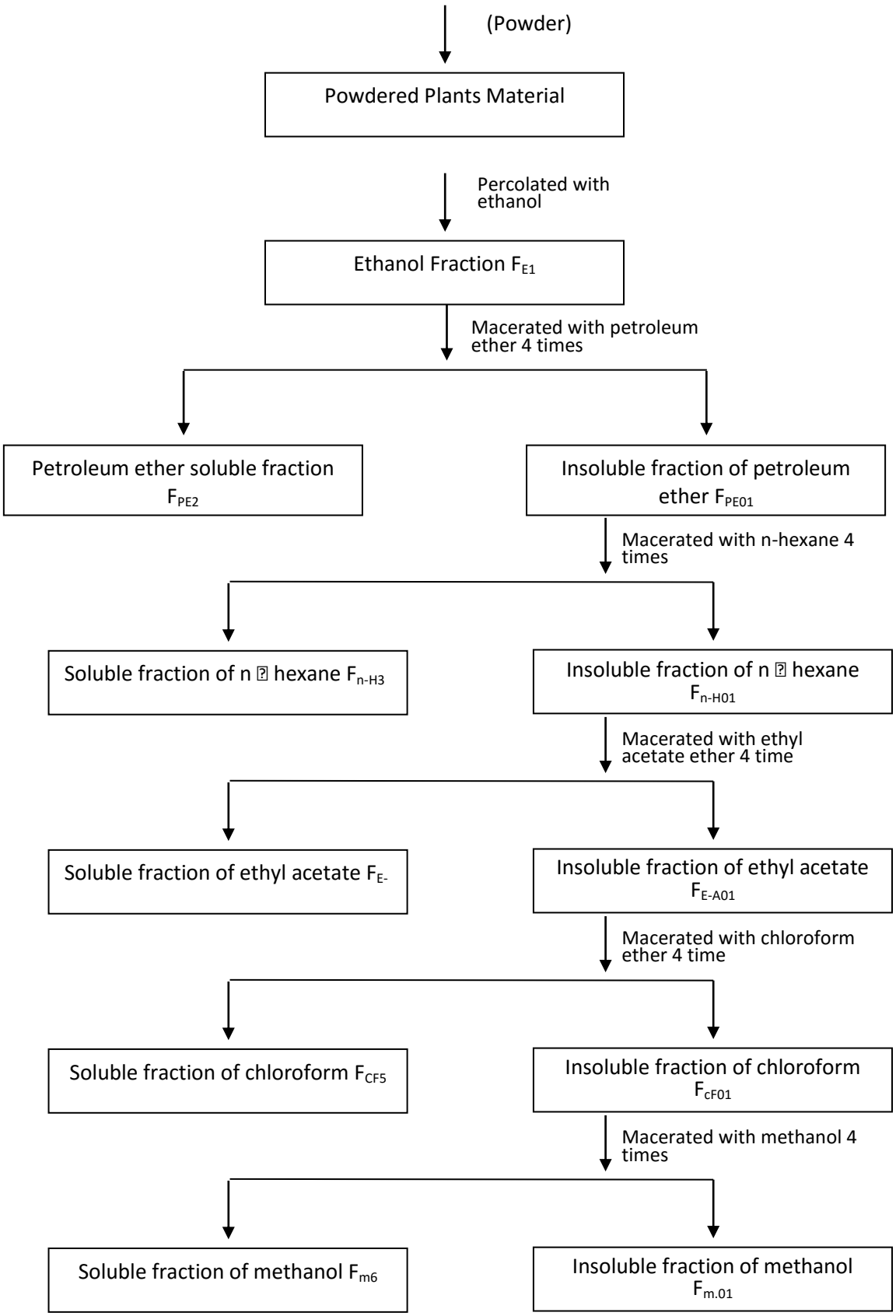
The *B. aegyptiaca* (leaves) and *C. sinensis* (peel) was collected from old campus Bayero University, Kano – Nigeria. The samples were dried and crushed into fine powder. Both the samples were authenticated by Professor Bala Sidi Aliyu of Biological Sciences Department Bayero University, Kano - Nigeria.

Extraction of Plant Samples

Each powdered plant samples (200g) was percolated with ethanol for two weeks, filtered and concentrated using rotary evaporator machine at 40^{o}c.

Maceration of Plant Materials

Maceration is a process of softening or separating the part of substance with or without heat. Maceration of each extract was carried out as shown in scheme 1.



Scheme 1; Maceration of the crude extracts of *B. aegyptiaca* (leaves) and *C. sinensis* (peel).[2]

Screening procedure

1 – Test for alkaloids

To some quantities of each extract dissolved in distilled water into two separate test tubes, 2 to 3 drops of Dragendroff`s and mayer`s reagents was separately added. Formation of red precipitate (turbidity) with mayer`s reagent indicates the presence of alkaloids. [2]

2 – Test for flavonoids

To each fractions some pieces of magnesium ribbons was added followed by concentrated hydrochloric acid drop wise. A colour ranging from crimson to magenta indicates the presence of flavonoids. [2]

3 – Test for Steroids

2 ml of the extracts transferred into separate test tubes and evaporate to dryness, the residue was dissolved in acetic anhydride and chloroform, concentrated sulphuric acid was added by the side of the test tube. Violet colour layer indicates the presence of steroids. [2]

4 – Test for Tannins

2 ml extract was diluted with distilled water in separate test tubes. 2-3 drops of 5%ferric chloride solution were added. A green or blue coloration indicates the presence of tannins. [2]

Results and Discussion

Results

Table 1: Phytochemical Screening Results of *Balanites aegyptiaca* (leaves) Extracts

Plant extracts	Alkaloids test	Flavonoids test	Tannins test	Steroids test
F_{E1}	+	_	+	_
F_{PE2}	+	_	+	_
F_{n-H3}	+	_	+	_
F_{EA4}	+	_	+	_
F_{CF5}	+	_	+	_
F_{M6}	+	_	+	_

+ = Presence. - = Absence.

Table 2: Phytochemical Screening Results of *Citrus sinensis* (peel) Extracts

Plant extracts	Alkaloids test	Flavonoids test	Tannins test	Steroids test
F_{E1}	+	+	+	+
F_{PE2}	+	+	+	+
F_{n-H3}	+	+	+	+
F_{EA4}	+	+	+	+
F_{CF5}	+	+	+	+
F_{M6}	_	+	+	+

+ = Presence. - = Absence.

Discussions

In the present investigation, preliminary phytochemical screening has been conducted on different fractions of *B. aegyptiaca* (leaves) and *C. sinensis* (peel) which revealed the presence of phytochemical constituents namely

alkaloids and tannins as shown in table 1, alkaloids, flavonoids, tannins and steroids as shown in table 2. All the extracts of *B. aegyptiaca aegyptiaca* (leaves) and *C. sinensis* (peel) showed the presence of alkaloids and tannins except that of methanol extract of *C. sinensis* (peel) which revealed the absence of alkaloids. Flavonoids and steroids are found to be absent in all the tested extracts of *B. aegyptiaca aegyptiaca* (leaves) but presence in *C. sinensis* (peel) extracts.

Tannins and flavonoids are phenolic compounds that are acting as principal antioxidants or free radical scavengers and reduction of coronary heart diseases. [7] Since these phenolic compounds were found to be present in the extracts, it might be accountable for the potential antioxidant capacity of the plant samples. Tannins and alkaloids have the potential of anti– hyperglycaemic and anti-inflammatory activities. [10] Presence of tannins and alkaloids could be responsible for various pharmaceutical properties of the plant samples. Steroids help in controlling metabolism, inflammation, immune functions salt and water balance, development of sexual character and ability to withstand illness and injury.[4] Presence of steroids in *C. sinensis* (peel) extracts indicate that the sample can be used in pharmacy due to the relationship of steroid compounds with sex hormones. Hence, phytochemical studies help in locating the source of pharmacologically active chemical compounds.

Conclusion and Recommendations

The results of phytochemical screening showed that *B. aegyptiaca* (leaves) and *C. sinensis* (peel) extracts indicate their potential source of bioactive principles that may supply drugs for modern medicines. The initial phytochemical screening may be helpful in screening of bioactive components and eventually may be help in detecting and development of new drugs. Further, these tests make easy quantitative estimation of pharmacologically active chemical compounds.

Further studies are therefore required for isolation, purification and characterization of bioactive components of the plant samples.

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