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Determination of the Phytochemical Compounds Constituent in the Seeds of *E.Camaldulensis*

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Abstract: *Medicinal plants are increasingly gaining acceptance even among the literates in urban settlements, probably due to the increasing inefficacy of many modern drugs used for the control of many infections such as typhoid fever, gonorrhea, and tuberculosis as well as increase in resistance by several bacteria to various antibiotics and the increasing cost of prescription drugs, for the maintenance of personal health. In this study, the phytochemical constituents of E. camaldulensis was determined. The result showed that theEucalyptus camaldulensisseeds contains tannins, steroids, saponins, flavonoids, alkaloids, volatile oil, Anthraquinone glycoside and glycoside compounds while there were a complete absence of cardiac glycoside and balsam. The result underlies the medicinal potentials of the plant as it could perform many antimicrobial functions.*

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I. Introduction

Plants are considered as largely complicated chemicals factories which can turn the relatively simple ingredients of air and water into so many compounds including liquids and oils(Mabey, 1997). Plants have been serving the animals' kingdom as its source of energy (food, fuel) as well as its means of shelter. In addition to the source of energy, plants have been synthesizing a large variety of chemical substances. These substances in addition to basic metabolites include, phenolic compounds, terpenes, steroids, alkaloids and other chemicals substances which as known as "secondary metabolites" which have prominent effect on the animals systems and some possess important therapeutic properties which can be and have been utilized in the treatment and cure of human and other animals diseases for many centuries. Secondary metabolites differ from plants to plants. The plants which produce and accumulate constituents have medicinal values are generally designated as "medicinal plants"(Mabey, 1997).

The Eucalyptus tree is a large, fast-growing evergreen that is native to Australia and Tasmania. The tree can grow to 375-480 feet (125-160 meters). Eucalyptus trees belong to the myrtaceae family. Their name originates from the Greek word "eucalyptol" which means "well covered". Eucalyptus trees thrive in environments that maintain average temperatures of about 60^0C. Eucalyptus trees (shown in pix 1) are well known for the medicinal properties of the oil contained in their leaves. The oil was used in traditional aboriginal medicines to heal wounds and fungal infections. Teas made of Eucalyptus leaves were also used to reduce fevers. Eucalyptus soon spread to other traditional medicine systems, including Chinese, Indian and Greek and European. Eucalyptus oil is believed to possess a wide variety of healing properties. It works very effectively as an antibiotic that is particularly successful against some strains of bacteria. The oil also possesses anti-inflammatory properties. It can help stimulate the flow of blood and works to ease muscle and joint pain. Eucalyptus oil also acts as an antiseptic and works well in treating sore throats, mouth sores, gum disease and gingivitis. The essential oil from the leaves is used as a disinfectant and in medicinal applications. Although Eucalyptus oil has been used orally to treat some conditions, the oil is toxic when taken by mouth and must be diluted (Musa *et al*, 2011).

Eucalyptus is used in many medicines to treat coughs and the common cold. It can be found in many lozenges, cough syrups, rubs, and vapor baths throughout the United States and Europe. Herbalists often recommend using fresh leaves in teas and gargles to soothe sore throats and treat bronchitis and sinusitis. Ointments containing Eucalyptus are also applied to the nose and chest to relieve congestion (Shaighal *et al*, 2012).

The aim of this study is to extract and determine the phytochemical compounds in the seed of*E.camaldulensis.*this is done by the qualitative analysis of phytochemical constituents of the seed of *E.camaldulensis.*and determining the phytochemical compounds present in the seed of *E.camaldulensis.*

Pix.1: Leaves of ***E.camaldulensis***tree

II. Materials and Method

Study area

The research was conducted at the Biochemistry Laboratory (Usmanu Danfodiyo University, Sokoto).The area lies within 11.30 to 13.500 N and 40 to 6.500 E above sea level, covering an area of 55.842 kilometer square. It lies within the Sudan Savanna ecological zone characterize by long dry season (October to May) and short rainy season (June to September).The mean annual precipitation in the area ranges from 300-600mm, and minimum and maximum temperature are 27^0 C around April and 40^0 C around April respectively (Singh and Babaji, 1990).

Collection of sample

The Seeds were collected in July 2018, in Agric/ chemical lab Usman Danfodio University and Bodinga road, Sokoto Local Government Area of Sokoto, Nigeria. The collected samples were labeled separately as sample A and sample B in different nylon bags and then taken to Usman Danfodio University main campus, Biochemistry laboratory for analysis.

Extraction of the plant materials

The collected seeds were washed with running tap water and shaded to dry. The dried seeds were crushed to coarsely powder. These coarse powders (25g) were then subjected to successive extraction in 250 ml of methanol solvent by using Soxhlet apparatus. The collected extracts were stored and then used for further analysis.

Qualitative analysis of phytochemicals in*E.camaldulensis*

The phytochemical screening of the collected extract is assess by standard method as described by (Harbone *et al*., 1998). The method is used to identify major natural chemical groups such as alkaloids, terpenoids, steroids, tannins, saponins, flavonoids, phenols and glycosides. General reactions in these analyses revealed the presence or absence of these compounds in the seed extract.

Detection of alkaloids

About 2 ml of each extract is stirred with 2 ml of 10% aquences hydrochloric acid. 1 ml is treated with a few drops of wagners reagent and second 1 ml portion is treated similarly with mayers reagent. Turbidity or precipitation with either of these reagents is taken as preliminary evidence for the presence of alkaloids.

Detection of Glycosides

5 ml of 10% H_2SO_4 is added to 5 cm^3 of the extracts in a test tube. The mixture is heated in boiling water for 15 minutes. Cool and neutralize with 10% NaOH, 5 ml fehling ‘s solution is added and the mixture is boiled. A brick-red precipitate is observed which indicate the presence of glycosides (Harbone, 1998).

Detection of steroids

This was carried out according to the method of Harbone 1998. 0.5g of the extract is dissolved in 2 ml of chloroform, 2 ml of sulphuric acid is carefully added to form a layer. A reddish-brown color at the interface indicate the presence of a steroidal ring.

Detection of saponins

5 ml of the extract will be placed in a test tube + 5 ml of water and shaked strongly. The whole tube will be filled with fronth that last for several minutes (Harbone, 1998).

Detection of tannins

Ferric chloride solution 5% ferric chloride solution will be added drop by drop 2-3 ml of the extract and the colored produced is noted. Condensed tannins usually give a dark green color; hydrolysable tannins give blue-black color (Harbone, 1998; Trease and Evans, 1999).

Detection of flavonoids

3ml aliquot of the filtrate and 1 ml of 10% NaOH sodium hydroxide is added, if a yellow color is developed. This indicates the possible presence of flavonoids (Harbone, 1998).

Detection of cardiac glycosides

To one of the half of extract, 2 ml of 3.5% ferric chloride solution is added and allowed to stand for one minutes. 1.5cmof Concentrated $H_2SO_4$is carefully poured down the wall of the tube so as to form laver. A reddish brown ring in the interface indicates the presence of cardiac glycoside.

Detection of volatile oils

1 ml of the fraction was mixed with diluted HCl. A white precipitate was formed which indicates the presence of volatile oils (Evans, 1980)

Detection of balsams

The extract was mixed with equal volume of 90% ethanol. 2 drops of alcoholic ferric chloride solution was added to the mixture. A dark green color indicates the presence of balsams (El-Olemy *et al.*,1994).

Detection of anthraquinones

5 ml of each plant extract is shaken with 10 ml of benzene, and 5 ml of 10% ammonia solution is added. The mixture is shaken and the presence of pink, red, or violet color in the ammoniacal (lower) phase indicates the presence of anthraquinones.

III. Results

The seed extracts of sample A is presented in table 1 while the seed extracts of sample B is presented in table .2

Table.1: shows the result of phytochemical constituents of *E.camaldulensis*seed extracts (sample A)

NO.	Phytochemical components	Seeds
1	Tannin	++
2	Saponin	++
3	Flavonoid	+
4	Alkaloid	+
5	Glycoside	++
6	Steroid	++
7	Cardiac glycoside	ND
8	Anthraquinone	+
9	Balsam	ND
10	Volatile oil	+

Keys: + = Trace, ++ = Moderate, ND = Not detected

Table.2: shows the result of phytochemical constituents of *E.camaldulensis*seed extracts (sample B).

NO	Phytochemical components	Seeds
1	Tannin	+++
2	Saponin	ND
3	Flavonoid	ND
4	Alkaloid	+
5	Glycoside	+++
6	Steroid	+++
7	Cardiac Glycoside	+
8	Anthraquinone	+++
9	Balsam	ND
10	Volatile Oil	+

Keys: + = Trace, ++ = Moderate, +++ = extremely, ND = Not detected5.0 DISCUSSION

The phytochemical screening results from table 1 shows that the*Eucalyptus camaldulensis*seeds contains tannins, steroids, saponins, flavonoids, alkaloids, volatile oil, Anthraquinone glycoside and glycoside compounds while There were a complete absence of cardiac glycoside and balsam. While in table .2 it shows

that *Eucalyptus camaldulensis* seeds contains tannins, alkaloid, glycoside, cardiac glycoside and volatile oils. While there is complete absence of flavonoids, saponins and balsam.

In table .1 tannins, saponins, glycosides and steroids are moderate, whereas in table .2 tannins, glycoside, anthraquinones and steroids are extremely present.

Flavonoid, anthrequinone, alkaloid and volatile oil are present in trace amount in table 1. While in table .2 alkaloid, cardiac glycoside and volatile oil are present in trace quantity. The reason behind writing Not detected instead of absent is that a compound maybe absent here and later when a similar research is taken place it may appear as the case of my sample A and sample B.

Tannins are known to have high medicinal value. They perform many antimicrobial functions (Haslam, 1996).

Saponins carry out medicinal functions which include serving as expectorant and emulsifying agents and having antifungal properties (Esuagu *et al*., 2007).

Alkaloids are used in nicotine sulfate, a byproduct of tobacco industry, as a very potent insecticide (Hans-Walter, 2005).

Steroidal compounds are of important and interest in pharmacy due to their relationship with such compound as sex hormones (Mabey, 1997).

glycoside widely used in herbal medication (Harbone 1998).

Anthraquinone often shows antimicrobial activity and considered to be associated with innate resistance of plant to diseases (Muell and Alugbade, 1996).

IV. Conclusion

The result of the present study signifies the use of *Eucalyptus camaldulensis*as exerting various medicinal activities since it contains various bioactive components. The plant could therefore serve as source of bioactive agents for production of new drugs.

Bioactive compounds such as, sterol, glycosine, saponins, flavonoids, and tannins compounds were detected to be present in the seeds of *Eucalyptus camaldulensis* plant. Since this plant had beenused in the treatment of different ailment such as used for treatingrespiratory tract infections, whooping cough, asthma, pulmonarytuberculosis, osteoarthritis, joint pain, acne, wounds, , bacterialdysentery, liver and gallbladder problems, cancer etc, the medicinalroles of this plant could be related to such identified bioactivecompounds.

V. Recommendation

This research indicates the presence of some bioactive components that serve for medicinal activities, there's need for a similar research to be conducted on the other parts of the plant such as leaves, stem-bark and fruits so as to expose their values and therapautic activities. The bioactive agents can be use forth for production of new drugs.

Efforts should be geared up at characterizing the entirebioactive agents present, in this plant for its full utilization.

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