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Determination of anti-bacteria Constituents of Cromolaena Odorata; A Pytochemical Analytic approach.

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Abstract

This study was carried out to know the photochemical constituents of Chromolaena odorata. This is a specie from family of Asteraceae. Experimental method was used in this study; during which fresh leaves of Chromolaena odorata was plucked, washed and dried using an oven at 50°C- 100°C. The leaves were pulverized into coarse form with electrical blender. The crude extracts were obtained by using ethanolic and aqueous solution. The extracts were tested for phytochemicals such as flavonoid, tannins, saponias, steroid, phenol and alkaloids. Saponin was only present in aqueous solution. The research concluded that Chromolaena odorata possess antibacterial, antifungal, antiparastic and anti-inflammatory properties. The study recommends that Chromolaena Odorata can be employed for the treatment of different bacteria in the indigenous system of medicine.

Keywords: Chromoiaena, Ethanol, Antibacteria, Treatment, Medicine

Introduction

Chronolaena odorata is a tropical specie of flowering shrub in the sunflower family, Asteraceae. It is native of Central and South America which has spread throughout the tropical and subtropical areas of the world. It is the common weed that is widespread in North America, from Florida and Texas to Mexico and the Caribbean, and has been introduced to tropical Asia, west Africa, and parts of Australia. Common names include Siam Weed, Christmas Bush, Devil Weed, Camfhur Giass and Common Floss Flower (Lahth, 2009) In Nigeria it is referred to as ‘obu ineñawa’ by the Igbos and ‘awolowo’ by the Yorubas (Ayodee, 2005). Chromolaena odorata is a rapidly growing perennial herb. It is a multi-

stemmed shrub rising to 2.5 m tall in open areas. It has soft stems but the base of the shrub is woody. In shady areas it becomes etiolated and haves as a creeper, growing on other vegetation. It can then become up to 10 tall. The plant is hairy and glandular and the leaves give off a pungent. aromitic odour when crushed. The eaves are opposite, triangular to elliptical with ied edges; leaves are 4—10 cm &1g by 1—5 cm wide. Leaf petioles are 1—4 long. The white to pale pink [tubular flowers are in panicles of 10 to 35 flowers that form at the ends of branches. The seeds are achene and are hairy. They are mostly spread by wind, enabling long dispersal. Seed production is 80000 to 90000 per plant. Seeds need heat to germinate.

Objective of the Study

The overall aim of this study is to extract, isolate, identify, and evaluate the photochemical from plant traditionally used for medicinal purposes. This study will cover the following objectives:

1. To extract the chemical compounds from the leaves of Chromolaena odorata by using ethanolic and aqueous solvent extraction.

2. To identify each photochemical present in the plait extract.

Materials and Methods

Reagents:

1. 90% Ethanol (CH5OH) - JHD Chemical LTD Poole England.

2. Distilled water - Locally distilled

3. Dillute HCI - Mayer and Baker Dangenham England

4. Olive oil - Andalucia,Spains

5. Ferric Chloride - BDH Chemical LTD Poole England

6. Chibroform - Mayer and Baker Dangenham England

7. Sulphuric acid - BDH Chemical LTD Poole England

8. Aqueous NaOH - BDH Chemical LTD Poole England

9. Ammonia (NH3) - BDH Chemical LTD Pdole England

10. Acetic anhydride - Mayer and Baker Dangenham England

Instrumentation:

1. Dropper

2. Electronic Weighing balance:

Model: HG-502N

Capacity: 500 g

Division: 0.01 g

3. Oven

Model: QCP-200A

Item No: LBO46A

Power: 1500W + 750W.

4. Conical flake

5. Beaker

6. Electrical blender

7. Sieve

8. Test tube

9. Whatmann filter paper

10. Masking tape

11. Separation funnel

Sample Collection:

The fresh plant leaves (Chromolaena odorata) were collected from the back of Biochemistry, Chukwuemeka Odumegwu Ojukwu University,Uli ,Ihiala Local Government Area of Anambra State. The leaves were identified by P.O Ugwuozor. Herbarium curator Botany Department in Nnamdi Azikiwe.

Sample Preparation

The leaves of Chromolaena odorata was thoroughly washed with tap water in order to remove the dust particle and debris from them and rinsed with distilled water. Leaves were separated, dried using oven at temperature of 50°C — 100°C for about 2 days after which the leaves were grinded to fine powder and stored in air tight foil for extract preparation.

Extract Preparation:

Aqueous extract

To obtain the crude aqueous, 0.5g of powdered sample was mixed with 25m1 of sterilized distilled water. The mixture was incubated at 25 LIC with constant shaking for three days (72hrs). Extract was filtered using Whatman filter paper and filtrate was then allowed to evaporate.

Ethanolic extract

Ethanolic extract was prepared using 90% ethanol.In 25ml, 0.5g of sample was added. After constant shaking for three days (72hrs) at room temperature, the sample was filtered. Filtrate was left open till all the solvent was evaporated leaving behind the crude ethanolic extract.

Qualitative Analysis

Detection of Flavonoids: Five ml of dilute ammonia solution were added to a portion of the ethanolic filtrate of each plant extract followed by addition of sulphuric acid. A yellow colouration observed in each extract

indicated the presence of flavonoids. The yellow colouration disappeared on standing (Sofowara, 1993; Harborne, 1973).

Detection of Alkaloids (Mayers's Test): Extracts were dissolved individually in dilute Hydrochloric acid and filtered. Filtrates were treated with Mayers's reagent. The presence of alkaloids is confirmed by the formation of yellow coloured precipitate.

Detection of Saponins (Foam Test): 0.5 gin of aqueous extract was shaken with 2 ml of water. If foam produced persists for ten minutes it indicates the presence of saponins. Few of olive oil was added to 0.5g of the exnact and vigorously shaken. Formation of soluble emulsion in the extract indicates the presence of saponin (Odebiyi and Sofowora, 1978).

Detection of Tannins: First, about 1 ml of the ethanol extract was added in 2 ml of water in a test tube. 2 to 3 drops of diluted ferric chloride solution was added and observed for green to blue-green (cathechic tannins) or a blue-black (gallic tannins) coloration (Sabir et al., 2012:).

Detection of Phenols: Ferric Chloride Test: Extracts were treated with 3-4 drops of ferric chloride solution. Formation of bluish black colour indicates the presence of phenols (Prashant et al., 2011).

Detection of Steroid: 1m1 extract was dissolved in 10 ml of chloroform & equal volume of sulphuric acid was added from the side of test tube .The upper layer turns red and sulphuric acid layer showed yellow with green fluorescence .This indicates the presence of steroid.(Rajaram et al.,2013)

Detection of Glycosides: A small amount of alcoholic extract of samples was dissolved in imi water and then aqueous sodium hydroxide was added. Formation of a yellow colour indicated the presence of glycosides.

Results

Qualitative Analysis Results

The results of the qualitative analysis are presented in Table 1.

Table 1: Qualitative analysis for the leaves of Chrornoiaena odorata

		Chrornolaena odorata
Phytochemicals	**Type of Test**	Eth
Tannins	Lead Acetate	+++
Flavonoids	Alkaline	+

Phenols	Ferric Chloride	+++
Steroids	Salkowski's	++
Glycosides		-
Alkaloids	Mayer's	++
Tests performed using aquecs imcts only		
Saponins	Foam	+++

KEY

Not present	-
Present at low Concentration	+
Present at moderate Concentration	++
Present at high Concentration	+++

Discussion

The use of plant extract or chemicals derived from the above analysis to treat disease has stood the test of time (Anwannil and Atta, 2006). The healing properties of medicinal plants are usually linked with the presence of these chemicals otherwise called secondary metabolites and these differ from one plant to another.

Our study revealed that Siam weed (Chrornolaena odorata) contained reasonable amount of flavonoids, phenolics, saponins,' steroids and tannins. Flavonoids have been reported as antidiarrhoeal (Schnier et al., 2005) antibacterial (Galeotti et al., 2008) and antimicrobial (Cushnie and Lamb, 2008). This may be the scientific basis for the exploitation of this plant for the treatment of skin diseases, sore throat, cough, pile, dysentery, chicken pox, measles, urnarv tract infections, gonorrhoea, toothache, e.t.c. Saponins have also been implicated as antimicrcbA and antifungal (Foerster and Hartmut, 2006). Therefore, the use of Chrom &-'..odorata for the treatment of fungi diseases like ring worm, guinea worm, IA1JI chseases, craw-craw, e.t.c. are justifiable. In addition to antimicrobial and aIáiJ activities of saponins, it also aids digestion and enhances nutrient absori F'ster and Hartmut, 2006). Similarly, tannins have been revealed to have antibacterial (Akiyama et al., 2001) and antiparasitic Kolodziej and Kiderlen, 2OOSi iim:ii.

Therefore, it is not surprising that Chrbn!: is used for the treatment of skin diseases and other viral arki diseases. Furthermore, talrnins have been implicated to be al : ziir ‘iood clotting and reduce blood pressure (Buck, 2003, Cox and Cux, 2009). The importance of phenolic as analgesic, antipyretic and anti-inflammatory phytochemical had been reported by Micheal (2008). This may be the reason why the plant is effective for the treatment of body pain. In addition, some phenolicretated substances are related to endocrine-disruptive chemicals (Micheal, 2008).

Conclusion

There is high presence of phytochernicals such as flavonoids, phenolics, saponins, steroids and tannins in Chiomolaena odorata confiims the anwira1, antibacterial, antiparastic and anti-inflammatory properties of the plant.

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