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Preliminary Phytochemical Analysis of Various Extracts of *Croton bonplandianus*.

Selvakumar S*, and Madhan Kumar U.

Department of Industrial BioTechnology, Bharath University, Chennai-600073, India.

ABSTRACT

The past decade has also witnessed an intense interest in herbal medicines in which phytochemical constituents can have long-term health promoting or medicinal qualities. In contrast, many medicinal plants exert specific medicinal actions without serving a nutritional role in the human diet and may be used in response to specific health problems over short- or long-term intervals. Phytochemicals present in vegetables and fruits are believed to reduce the risk of several major diseases including cardiovascular diseases, cancers as well as neurodegenerative disorders. Therefore people who consume higher vegetables and fruits may be at reduced risk for some of diseases caused by neuronal dysfunction Therefore, it is of interest to investigate the various phytochemical constituents of aqueous methanolic, aqueous chloroformic and aqueous ethyl acetate extracts of *Croton bonplandianus* were screened. Our results indicate that the presence of phytochemical constituents such as alkaloids, flavonoids, steroids, tannins and cardiac glycosides.

Keywords: Phytochemicals, Chloroform, fruits, alkaloids, flavonoids, steroids,

**Corresponding author*



INTRODUCTION

In the modern world it has been realized the herbal drugs strengthens the body system specifically and selectively without side effects. The importance of traditional herbal medicinal system has now gained vital importance in developed countries has been briefly described [1]. The herbal medicinal practices adopted by traditional medicine-man in Central India for cure of various diseases occurring in tribal pockets. India is blessed with rich and diverse heritage of cultural traditions. Plants are prospective source of antimicrobial agents in different countries [2]. About 60 to 90% of populations in the developing countries use plant-derived medicine. Traditionally, crude plant extracts are used as herbal medicine for the treatment of human infectious diseases [3]. Plants are rich in a variety of phytochemicals including tannins, terpenoids, alkaloids, and flavonoids which have been found *in vitro* to have antimicrobial properties [4]. Although the mechanism of action and efficacy of these herbal extracts in most cases is still needed to be validated scientifically, these preparations mediate important host responses [5]. *Croton bonplandianus* is a much-branched, woody herb, 20-50 cm tall, branches stellate-hairy to glabrous. Leaves alternate or subopposite, shortly petiolate; lamina 1.2-3.2 cm long, narrowly ovate-lanceolate, apex acute, cuneate at base. Inflorescence terminal, 5-7 cm long, flowers laxly distributed. Male flowers small, white occupies the upper portion of the inflorescence. Female flowers few at the base of the inflorescence. Capsule 0.45 x 0.4 cm, oblong-ellipsoid, shallowly 3-lobed. Actions and uses: Juice of 3-4 leaves is given for 3-4 days to cure cough. Seed paste is applied locally on eczema and ringworm to cure [6]. Therefore it is of interest to investigate the phytochemical analysis of *Croton bonplandianus*.

MATERIALS AND METHODS

Collection of samples

The medicinal plant used for the experiment were leaves of *Croton bonplandianus* were collected from Chennai, Tamil Nadu, India.

Preparation of extracts

500 grams of dried leaves of *Croton bonplandianus* was packed in five separate round bottom flask for sample extraction using solvents namely, Chloroform(70%)-Water(30%) mixture, Acetone, Ethyl Alcohol(70%)-Water(30%) mixture, Ethyl Acetate, and Water. The extraction was conducted by 150 ml of the each solvent mixture for a period of 24 hours. At the end of the extraction the respective solvents were concentrated under reduced pressure and keep it in water bath (at 50°C). Now the extracted experimental solutions were stored in refrigerator.

Phytochemicals analysis

The extracts were prepared and analyzed for the presence of alkaloids, saponins, tannins, steroids, flavonoids, anthraquinones, cardiac glycosides and reducing sugars based on the protocols available in the literature [7-12].

Test for alkaloids

The extract of the crude dry leaf powder of each solvent was evaporated to dryness in boiling water bath. The residues were dissolved in 2 N Hydrochloric acids. The mixture was filtered and the filtrate was divided into three equal portions. One portion was treated with a few drops of Mayer's reagent, one portion was treated with equal amount of Dragondroffs' reagent and the third portion was treated with equal amount of Wagner's reagent respectively. The appearance of creamish precipitate, the orange precipitate and brown precipitate indicated the presence of respective alkaloids.

Test for Saponins

About 0.5 g of the plant tuber extract was vigorously shaken with water in a test tube and then heated to boil. Frothing was observed which was taken as a preliminary evidence for the presence of the saponins.



Test for tannins

About 0.5 g of plant tuber extract was added was in 10 ml of water in a test tube and filtered. A few drops of 0.1% ferric chloride was added and observed for brownish green or blue-black coloration .

Test for steroids

2 ml of acetic anhydride was added to 2 ml of plant tuber extract of each sample along with 2 ml sulphuric acid. The colour changed from violet to blue or green in some samples indicating the presence of steroids.

Test for flavonoids

2 ml of extract solution was treated with 1.5 ml of 50% methanol solution. The solution was warmed and metal magnesium was added. To this solution few drops of conc. Hydrochloric acid was added and the red colour was observed for flavonoids and orange colour for flavones .

Test for anthraquinones

About 0.5 g of extract was taken in a dry test tube and 5 ml of chloroform was added and shaken for 5 min. The extract was filtered and the filtrate shaken with equal volume of 10% of ammonia solution. A pink violet or red colour in the ammonical layer indicates the presence of anthraquinones.

Test for cardiac glycosides

0.2 g of extract was dissolved in 1 ml of glacial acetic acid containing 1 drop of ferric chloride solution. This was then under layered with 1ml of concentrated sulphuric acid. A brown ring obtained at the interface indicated the presence of a deoxysugar characteristic of cardioids.

Test for Proteins

To 2ml of protein solution 1ml of 40% NaOH solution and 1 to 2 drops of 1% CuSO₄ solution was added. A violet colour indicated the presence of peptide linkage of the molecule

Test for Amino Acids

To 2 ml of sample was added to 2 ml of Ninhydrin reagent and kept in water bath for 20 minutes. Appearance of purple colour indicated the presence of amino acids in the sample

Test for Tri-Terpenoids

5ml of each extract was added to 2ml of chloroform and 3ml of con. H₂SO₄ to form a monolayer of reddish brown coloration of the interface was showed to form positive result for the tri-terpenoids.

Test for Reducing Sugar

To 2 ml of extract 2drops of Molisch's reagent was added and shaken well. 2ml of conc. H₂SO₄ was added on the sides of the test tube. A reddish violet ring appeared at the junction of two layers immediately indicated the presence of carbohydrates.

Croton bonplandianus



RESULTS AND DISCUSSION

Preliminary Phytochemical analysis of Aqueous methanol , Aqueous chloroformic and Aqueous methanol extract of *Croton bonplandianus*.

S.No	Phytochemical Constituents	Aqueous Methanol extract	Aqueous Chloroformic extract	Aqueous Ethylacetate extract
1	Flavonoids	++	++	++
2	Alkaloids	++	++	++
3	Tri-Terpenoids	++	--	--
4	Saponins	--	--	--
5	Tannins	++	++	++
6	Reducing Sugars	++	++	++
7	Amino Acids	--	--	--
8	Proteins	--	--	--
9	Anthroquinones	--	--	--
10	Steroids	++	--	++
11	Cardiac Glycosides	++	++	++

Medicinal plants have a long tradition of use outside of conventional medicine. It is becoming more main stream as improvement in clinical research shows the value of herbal medicine in the treatment and prevention of disease. The increasing population of the world especially the developing countries requires that the search to accommodate this increase be broadened in the use of various plants so as to ensure easy reach and minimization of certain health care problems through meeting up with the medicinal needs. Table 1. showed that Preliminary Phytochemical analysis of Aqueous methanol ,Aqueous chloroformic and Aqueous ethyl acetate extract of *Croton bonplandianus*.The phytochemical screening of aqueous methanolic extract revealed the presence of Flavonoids, Tannins, Tri-terpenoids, Alkaloids, Triple sugars,Cardiac glycosides and Steroids remaining all phytoconstituents were absent. In aqueous ethyl acetate extract contains Flavonoids, Alkaloids,Tannins, Steroids, Triple sugars and Gardiac glycosides remaining phytoconstituents was absent. Flavonoids, Alkaloids, Triple sugars ,Tannins and Cardiac glycosides were presnt in the the aqueous chloroformic extract of *C.bonplandianus* and remaining phytochemicals were absent.

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