

Phytochemical Analysis of Some Plants Used for Treatments of Respiratory Tract Disease in Zuru Metropolis

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Abstract: Plant Phytochemical play a vital role in production of medicine. Four different plants known for herbal treatment of respiratory tract infections were collected namely; *Sida cordifolia* (Flannen weed), *Urena lobata* (Caeserweed), *Ficus glumosa* (Hairy fig) and *Weltheria indica* (Sleeping morning tree.) The plants were collected fresh from Zuru Local Government Area of Kebbi State Nigeria. And was taken to the Herbarium of Kebbi State University of Science and Technology for Identification. From each plant leaves were removed washed, air dried under room temperature and ground to powder. The ground leaves of the sample plants were soaked in two different solvent; Ethanol, and water for 24 hours for Phytochemical analysis. The analytical chemistry method was adopted for determination of presence or absence of chemicals by Qualitative analysis. The results shows presence (+) of Flavonoid, Alkaloids, Tannin, Phenol, Glycosides, Saponin, and Steroids; the results showed the presence of almost all the phytochemicals in the sample plants when the two solvents are considered. Moreover, *Ficus glumosa*, *Weltheria indica* and *Urena lobata* are plants that contain highest level of phytochemicals like Flavonoid, Alkaloids, Tannin, Phenol, Glycosides, Saponin, and Steroids while they are not commonly present in *Sida cordifolia*. These plants showed potential for treatment of respiratory diseases of properly utilized.

Keywords: Phytochemicals, Zuru, Plants, Respiratory Tract Diseases

1. Introduction

Plants have been utilized for treatment of diseases many years ago. According to the world health organization, herbal medicines are being used by about 80% of the world population primarily in the developing countries for primary health care [1, 18]. This plant-based traditional medicinal system continues to play an essential role in health care [3]. The research aim at analyzing the phytochemicals present in *Ficus glumosa*, *Weltheria indica*, *Sida cordifolia* and *Urena lobata* plants known to be used for treatment of respiratory tract diseases.

Plants medicinal values lies in their bioactive phytochemical constituents that produce definite physiological action on the human body [2]. The bioactive

phytochemical constituents include; alkaloids, essential oils, Tannins, flavonoids, Saponins, Terpenoid, Phenolic compounds e.t.c [5, 6]. These natural compounds formed the foundations of modern prescription drugs as we know today [9, 14].

These bioactive compounds are mainly found in vegetables, fruits, medicinal plants, flowers, leaves and roots that work with nutrients and fibers to act as defense mechanism of plants against diseases. The phytochemicals are divided into two namely; primary and secondary constituents; depending on their functions in plant metabolism [6].

Primary constituents comprise of common sugars, amino acids, proteins and chlorophyll while secondary constituents consist of alkaloids, terpenoids and phenolic compounds [11].

Medicinal plants are plants that contain substances that

could be used for therapeutic purposes or which are precursors for the synthesis of useful drugs [14]. WHO has promoted ethnobotanical studies and pharmaceutical research to improve herbal medicines and to promote their optimal use in health care [17]. There is a gradual revival of interest in the use of medicinal plants especially in developing countries. Herbal medicines have been reported to be safe for consumption without any adverse side effects [7, 1, 8].

2. Materials and Methods

2.1. Study Area

The fresh leaves of the plants were collected at Federal University of Agriculture Zuru, in Kebbi state Nigeria geographical location of 11° 25' 49" North, 5° 14' 15" East.

2.2. Identification of Plants

The plants were identified at Kebbi State University of Science and Technology Aliero herbarium by Prof. Dhramendra Singh a plant Taxonomy. The samples were dried in the laboratory at ambient temperature (28 – 30°C), and was ground to powder. At the end of the drying and grinding process each of the two samples were placed into four different conical flasks.

2.3. Qualitative Phytochemical Analysis

The qualitative phytochemical Analysis was carried out using the Standard methods of Analytic of Organic Analytical Chemistry [4] Ten (10g) of each sample was weighed separately into four different labeled conical flasks. Up to 100 ml of the four different solvents namely; distilled water, n-hexane, ethanol and ethyl acetate which was added into different conical flasks for a day. After 24hrs, the mixtures were filtered using what man filter paper (No. 1) into conical flasks. The filtrates were concentrated by placing the flasks into water bath at 100°C. The filtrate was then cooled to room temperature, the solution after cooling was used for qualitative test using 2mls of each plant sample of different solvent separately both the Mayer and Wagner's reagents for the analysis were prepared as described by [4, 10].

3. Results

2.3.1. Test for Alkanoids

Two (2ml) of ethanol extract and aqueous plants extract were measured separately and few drops of meyer's reagent added in test tubes. The formation of orange brown precipitate indicates the presence of Alkanoids.

2.3.2. Test for Flavanoids

Two (2ml) of ethanol plant extract and aqueous plants extracts was measured separately and two drops of concentrated ammonia was added. The formation yellow coloration indicates positive result of flavonoids.

2.3.3. Test for Saponins (Froth Test)

Two (2ml) each of ethanol extract and aqueous plants extract was measured and mixed with 2ml of distilled water test tube. The mixture was shaken and observed for the presence of stable froth. Froth (foam) indicate the presence of saponins.

2.3.4. Test for Tannins

Two (2ml) each of ethanol extract and aqueous plants extract was measured separately and mixed with drops of dilute ferric chloride solution. The formation of dark (greenish dark) precipitate indicates positive result for the presence of tannins.

2.3.5. Test for Glycosides

Two (2ml) each of ethanol extract and aqueous plants extract was measured and added to 2ml of sulphuric acid to form a lower layer. Reddish-brown coloration at the interface indicates the presence glycosides.

2.3.6. Test for Steroids

Two (2ml) of ethanol plant extract and the aqueous extract was measured separately with 2ml of ferric chloride solution and the mixture was shaken. The formation of brownish solution indicates the absence of steroids.

2.3.7. Test for Terpenoids

Two (2ml) of ethanol plant extract and aqueous plant extract, were mixed in 5ml of chloroform and 5ml concentrated of sulphuric acid was carefully added to form a layer. A reddish brown coloration at the interface indicate the presence of terpenoids.

Table 1. Ethanol extracts test of the four Sampled plants.

Parameters	<i>Ficus glumusa</i>	<i>Weltheria indica</i>	<i>Sida cordiforlia</i>	<i>Urena lobate</i>
Alkaloids	-	+	+	+
Tannins	-	+	-	-
Steroids	+	+	-	+
Saponins	+	+	+	+
Glycosides	-	-	-	-
Terpenoids	+	+	-	+
Flavonoids	+	+	+	-

Key: + = Detected, - = Not detected

Table 2. Aqueous extracts test of the four Sampled plants.

Parameters	<i>Ficus glumosa</i>	<i>Weltheria indica</i>	<i>Sida cordifolia</i>	<i>Urena lobate</i>
Alkaloids	+	+	-	+
Tannins	+	-	+	+
Steroids	+	+	-	+
Saponins	+	+	+	+
Glycosides	-	+	+	+
Terpenoids	+	-	-	+
Flavonoids	+	+	+	+

Key: + = Detected, - = Not detected

4. Discussion

The detected phytochemicals in all four samples are of great significance, some variation in the result especially in same sample is due to difference in extraction solvent. The bioactive compounds from medicinal plants permits the exhibition of their physiological activity stated by Subbiah, M. et al. [13]. Such phytochemicals chemicals of medicinal importance were reported by Eleazu, C. O. et al. and Suffredini, I. B. et al. [7, 15].

Saponin present in plants are natural product of a potent calcium-activated potassium channel opener, and as such can be used for treating cardiovascular, urological, respiratory, neurological, and other disorders [7]. Flavonoids contained in plants especially on their fruits and vegetables, especially flavanones, can be used to reduce the risk of non-allergic rhinitis and Corticosteroids have a proven beneficial role in asthma, and interstitial lung disease, hemangioma of trachea, Pulmonary eosinophilic disorders as reported by Subbiah, M. et al. [13].

Alkaloids are present and Indole alkaloids were reported to be promising for potential therapeutic purposes and appear to be particularly effective against respiratory diseases in an experimental studies performed, both in vivo and in vitro, to evaluate the effectiveness of indole alkaloids for the management of respiratory disorders, including asthma, emphysema, tuberculosis, cancer, and pulmonary fibrosis [16].

The tannins are polyphenolic secondary metabolites with high molecular weights, have been reported to be naturally present in a wide variety of fruits, vegetables, cereals, and leguminous seeds and are known to contain protective properties, such as anti-cancer, anti-microbial, anti-oxidant, anti-hyperglycemic as reported by Osman et al. [12]. Tannins are helpful in tackling a wide range of non-malignant respiratory diseases such as acute lung injury (ALI), pulmonary fibrosis, asthma, pulmonary hypertension, and chronic obstructive pulmonary disease. Results obtained shows that these plants contain considerable amount of tannins hence would serve as supplementary drugs in treating respiratory tract disease.

5. Conclusion

The plants *Ficus glumosa*, *Weltheria indica* and *Urena lobata* are said to contain phytochemicals namely; Flavonoid,

Alkaloids, Tannin, Phenol, Saponin, and steroids which can be utilized for drug production.

Competing Interest

All Author (s) confirm the article content have no conflicts of interest.

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