

Phytochemical Analysis of *Acalypha Wilkesiana*, *Leucaena Leucocephala*, *Peperomia Pellucida* And *Sena Alata* Leaves

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-----ABSTRACT-----

Phytochemical analysis of Acalypha wilkesiana, Sena alata, and Leucaena leucocephala and peperomia pellucida was carried out. The result of the Phytochemical analysis of the ethanolic leaf extracts of A. wilkesiana revealed a high presence of tannins and glycoside, a moderate presence of saponin, flavonoids, Phylobatanins and glycosides (reducing sugar) and slight presence of alkaloids and cardiac glycosides. Peperomia pellucida has no Phylobatanins and glycoside from (Glycosides) with moderate presence of tannins, flavonoids, glycosides (reducing sugar) and cardiac glycosides and slight presence of saponin and alkaloids. Leucaena leucocephala revealed slight presence of phylobatanins, alkaloid and cardiac glycosides and high presence of tannins and Glycosides (reducing sugar and glycoside) with moderate presence of flavonoids and saponin. Sena alata extract revealed moderate presence of tannins, flavonoids, phylobatanin and cardiac glycosides, a slight presence of saponin; alkaloids was absent. The ethanolic extracts of the four plants contain useful active organic constituents which could play a vital roles in fish health and human diseases treatment.

KEYWORDS: *Acalypha wilkesiana, Sena alata, and Leucaena leucocephala and peperomia pellucida, ethanolic extract, Phytochemical analysis.*

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I. INTRODUCTION

Acalypha wilkesiana (Copper leaf) belongs to the family Euphorbiaceae. The genus *Acalypha* comprises about 570 species (Riley, 1963), a large proportion of which are weeds while the others are ornamental plants. There are a quite reasonable number of cultivars worldwide, the macrophylla, hofammani, godseffiana, macefeena, hispida marginata and racemose are peculiar cultivars within Nigeria (Oladunmoye, 2006; and Yusha'u *et al*, 2008) this plant grows as an annual bedding plant (Oladunmoye, 2006). It is a fast growing evergreen shrubs which provides a splash of colour in the landscape with bronze red to muted red, the leaves appear as heart shaped with combination of colour like green, purple, yellow, orange, pink or white depending on cultivation. *Acalypha wilkesiana* juice or boiled decoction was reported to be used in the treatment of gastrointestinal disorders and fungal skin infection such as pityriasis versicolor, impetigo contagiosa, candida intetrigo, Tinea versicolor, Tinea corporis and Tinea pedis (Ogundaini, 2005). Akinde (1986) reported the presence of sesquiterpene, monoterpenes, triterpenoids and polyphenols. Oladunmoye (2006) reported the presence of saponins, tannins, anthraquinan and glycoside in the leaves of *Acalypha wilkesiana*. *Acalypha wilkesiana* has antibacterial and antifungal properties (Akinde, 1986; Alade and Irobi, 1993, Adesina *et al*, 2000, Ogundaini, 2005 and Oladunmoye, 2006) *Leucaena leucocephala* (Lead tree) belongs to the family Fabaceae. It has its origins in central America and the Yucatan peninsula of Mexico and has been recongined over 400 years ago and spread worldwide (Brewbaker *et al*, 1985). *Leucaena leucocephala* is a thornless long-lived shrub or tree which may grow to heights of 7-18m; leaves are bi-pinate, produces a cluster of flat brown pods 13-18mm containing 15-30 seeds (Jones, 1979). *Leucaena* was known as miracle tree because of its worldwide success as a long-lived and highly nutritious forage tree, used as firewood, timber, human food, green manure, shade and erosion control and it is estimated to cover 2-5 million ha worldwide (Brewbaker and Sorensson, 1990). *Leucaena* eaten by ruminants is palatable, and that the young leaflet of *Leucaena* contain an alkaloid and mimosine. Mimosine is broken down by microbes in the rumen to DHP (3 hydroxy-4-(IH)-Pyridone) a goitrogen, which is normally broken down further by rumen microorganisms to non-toxic compounds (Jones, 1979)

Peperomia pellucida belongs to the family Piperaceae, it is an annual, shallow-rooted herb (Ghani,1998) Peperomias are herb of tropical regions and spread worldwide, It grows to a height of about 15-45cm and is characterized by succulent stems, shiny, heart-shaped, fleshy leaves and tiny dot-like seeds attached to several fruiting spikes (Dos-santos et al., 2001). *Peperomia* whole plant is medicinal used to cure haemorrhage, fever, abdominal pain, boils, renal disorders, rheumatic pain, mental disorder, eaten as salad for treatment of gout and arthritis, used to lower cholesterol level in blood in the Northeastern Brazil (Aziba et al., 2001). Dos santos et al (2004) have studied the oil extracted from different species of *Peperomia* in Brazilian Atlantic forests. De Fatima et al (2004) have studied the anti-inflammatory and analgesic properties of *Peperomia*. Oral administration of the extract of *Peperomia pellucida* in rat has been confirmed (Arrigoni et al., 2002, De Fatima et al., 2004) to interfere with the synthesis of prostaglandin, thus acting as anti-inflammatory agent. Similar studies by Khan et al (2002) showed anti-microbial activity of *P. pellucida* extract against numerous species of bacteria including *Bacillus subtilis*, *Escherchia coli*, *pseudomonas aeruginosa* and *staphylococcus aureus*. *Sena alata* (candle bush) belongs to the family *Caesalpinaceae*. A native of Mexico and found in diverse habitats worldwide. The shrub stand 3-4 meter tall with leaves up to 50-80cm long, the inflorescence looks like a yellow candle. The plant also called the ringworm bush and has fungicidal properties for treating ringworm and other infections of the skin. This study is therefore designed to investigate the Phytochemicals in them which was tested on some pathogenic fish bacteria.

II. MATERIALS AND METHODS

Plant Collection : Fresh leaves of *Acalypha wilkesiana*, *Leucaena leucocephala*, *Peperomia pellucida* and *Sena alata* were collected in the University Arboretum in March, 2011 from Federal University of Agriculture, Abeokuta, Ogun State.

Plant Extraction : 40g of fresh leaves each was placed in a soxhlet apparatus and extracted with 150ml 95% ethanol and heat was applied at 60°C for 4 hour. The ethanol evaporated leaving the extract behind. Thereafter, the extracts were air dried to reduce the volume to concentrated form of 25ml in a test tube and cover with foil yielding 6:1 ratio and stored at a room temperature until used.

Determination Of The Phytochemical Constituent: The extract was evaluated for the presence of tannins, flavonoids, Phylobatanins, glycoside, cardiac glycosides, saponins, alkaloids using standard methods by Sofowora (1993).

III. RESULT

The result of Phytochemical analysis obtained from ethanolic leaf extract of *A. wilkesiana* indicated that cardiac glycoside and alkaloids were slightly present; saponin, flavonoids, Phylobatanins and glycosides (reducing sugar) are moderately present while tannin and glycoside (from glycosides) are highly present (Table 1). Phylobatanins, alkaloids and cardiac glycosides are slightly present in *Leucaena*, saponin and flavonoids are moderately present while tannins and glycosides (reducing sugar and glycoside) are highly present. (Table 1). Alkaloids was absent in *Sena* and Saponin was slightly present. Tannins, flavonoids, phylobatanins, glycosides (reducing sugar and cardiac glycosides are moderately present while glycoside from glycosides was highly present. Phylobatanins and glycosides from glycosides was absent; saponin, alkaloids are slightly present while tannins, flavonoids, glycosides (reducing sugar) and cardiac glycosides were highly present. (Table 1.)

Table 1. Phytochemical constituents of ethanolic extracts of 4 plant leaves.

Chemical components	plant samples			
	<i>Acalypha</i>	<i>Leucaena</i>	<i>Sena</i>	<i>Peperomia</i>
1. Test for tannin				
i) Ferric Chloride	+++	+++	++	++
2. Test for saponin				
1) Froth test	++	++	+	+
3. Test for flavonoids				
i.) Ferric Chloride test	++	++	++	++
4. Test for Phylobatanins				
i.) Hydrochloride acid test	++	+	++	-
5. Test for Glycosides				

i.) Reducing Sugar		++	+++	++	++
ii.) Glycoside	+++	+++	+++	-	++
6. Test for Cardiac glycosides		+	+	++	++

Key: -(Not Present), + (slightly present), ++ (moderately present), +++(highly present).

IV.DISCUSSION

The presence of tannins in the plant extracts can be pharmacologically useful as astringent. Tyler (1988) reported that the astringent activity of tannins is by precipitating proteins, tissue leading to improvement of wound healing. Tannins inhibit microbial proliferation by denaturation of enzymes involved in microbial metabolism (Awosika, 1991). It is antibacterial (Akiyama *et al*, 2001). Saponins are used in veterinary medicine/vaccines as adjuvant (e.g. Foot and Mouth disease vaccines) helping to enhance immune response. They are also mild detergent and can be used commercially as well as for research (Belch and Belch, 2000). In addition, because of its ability to permeate cells without destroying cells morphology, it is used in laboratory applications to treat live cells in order to facilitate peptide or reagents such as antibodies entering cells instead of the detergents (Belch and Belch, 2000). The presence of flavonoids in the extracts is commonly known for their antioxidant activity. They are modifiers which modify the body's reactions to allergens, viruses and carcinogens. They show anti-allergic, anti-inflammatory, antimicrobial anti-cancer activity (Belch and Belch, 2000) and may be useful in therapeutic roles (Jisika *et al*, 1992).

Alkaloids are organic compounds that contain nitrogen, and are physiologically active with sedatives and analgesic properties. They are used in relieving pains, anxiety and depression (Jisika *et al*, 1992). Glycosides are compounds containing a carbohydrate and non-carbohydrate residue (moiety) in the same molecule. They all contain steroid as aglycone component in combination with sugar molecule. They are important in medicine because of their action on heart and are used in cardiac insufficiency (Belch and Belch, 2000). Thus, cardiac glycosides are drugs and can be used in the treatment of congestive heart failure and cardiac arrhythmia. They work by inhibiting the Na⁺/Na⁺ pump, resulting in an increase in the level of sodium ions in the myocytes, which then leads to a rise in the level of calcium ions. This inhibition increases the amount of Ca²⁺ ions available for concentration of the heart muscle, improves cardiac output and reduce distention of the heart (Bertorello *et al*, 1990; Clausen and Nielson, 1994; Beltowski *et al*, 1998). Cardiac glycosides have been used in the treatment of congestive heart failure, constipation, Oedema and microbial infections (Robinson, 1967 and Franstisk, 1991). Therefore all the plant extracts having cardiac glycosides could be used for this ailment. The results of this study shows that *Acalypha wilkesiana*, *Leucaena leucocephala*, *Peperomia pellucida* and *Senna alata* contains pharmacologically active principles which are extensively used in chemotherapy useful in the treatment of bacterial infections and related diseases in fish and human as well enhancing immune responses and are of great immense medicinal value.

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