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*Full Length Research Paper*

# Phytochemical Constituent and Antioxidant Potential of the Leaf Extract of *Flueryaaestuans* L (Urticaceae)

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Extracts from the leaves of *flueryaaestuans* were investigated for phytochemical constituents and antioxidant activity. Test for tannins, steroids, flavonoids, saponins, sterols, cardiac glycosides and alkaloids were positive in methanol extracts. The methanol extract of *flueryaaestuans* had a DPPH Scavenging activity of 77.89% at 100mg/ml, Total phenol of 0.141 at 100mg/ml and free reducing antioxidant properties (FRAP) of 0.218 at 100mg/ml respectively. These value were comparable those of ascorbic acid, 93.86% at 100mg/ml, Gallic acid, 5.498 at 100mg/ml and ascorbic acid 4.20 at 100mg/ml as standard for DPPH Scavenging, total phenol, and FRAP respectively. These findings suggest the rich phytochemicals content of *flueryaaestuans* and its good antioxidant activity may be responsible for its traditional use; such as antidote for poison, rickets in children, constipation, antiulcer, etc.

**Keywords:** *flueryaaestuans*, phytochemicals, antioxidant activity and total phenol.

## INTRODUCTION

The use of plants as medicines are an ancient practice common to all societies especially the African society. This practice continues to exist in the developing nations (Usman and Osuji, 2007). It also on the basis of this that researchers keep on working on the medicinal plants in order to produce the best medicines for physiological uses. Plants show enormous versatility in synthesizing complex materials which have no immediate obvious growth or metabolic functions. These complex materials are called secondary metabolites (Akinmoladun et al., 2007). Plants secondary metabolites have recently been referred to as phytochemicals. Phytochemicals are

naturally occurring and biological active plant compounds that have potential disease inhibiting capabilities. It is believed that phytochemicals may be effective in combating or preventing disease due to their antioxidants effect (Farombi et al., 1988). Antioxidants protect other molecule (in vivo) from oxidation when they are exposed to free radicals and oxygen species which have been implicated in the a etiology of many diseases and in food deterioration and spoilage (Kasaikina, 1997; Koleva et al., 2000). *Flueryaaestuans* is an erect, annual herb growing up to 1.5 m high with long stinging hairs (Hutchinson and Dalziel, 1963). The leaves are greenish, alternate, more or less spirally arranged, and oval shaped of about 10-15 cm long and 8-12 cm wide, cordate at the base and narrowly pointed at the apex, and coarsely toothed with hairs on both sides (Akobundu and

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Agyakwa, 1976). The decoctions of *F. aestuans* roots and leaves are used as antidote for poisoning especially from snakebites (Kowaro, 1976). The leaves have been reported to be used for the treatments of rickets in children, constipation, wound dressing, and as a postpartum tonic (Iwu, 1993). Gastro-Protective Effects of the Leaf Extract and Fractions of *Fleuryaestuans* L (Urticaceae) has been studied (Aka et al., 2009). Also, the antiulcer properties of this plant has been reported (Ukwe and Nwafor, 2003). In Western India, it is used to relieve rheumatic pain and as a diuretic. The aqueous leaf extract of *F.aestuans* is popular in traditional medicine practice in southern part of Nigeria as a palliative in a variety of stomach disturbances.

The present work has been designed to evaluate the antioxidant potential of methanol extracts from the leaves of *f.aestuans* and to explore the basis for its traditional use.

## MATERIALS AND METHODS

### Chemicals

DPPH [2,2-diphenyl-1-picrylhydrazyl] radical Gallic acid, ascorbic acid and folin-Ciocalteu reagent were obtained from sigma-Aldrich, USA. All other chemicals and reagent used were of analytical grade.

### Plant material

Whole plants of *flueryaestuans* were purchased from the market, in Ondo southwest, Nigeria and identified at the department of crop, soil and pest management, Federal University of Technology, Akure. They were air dried, packed in paper bags and stored. The dried plant was pulverized and 250g of pulverized sample was extracted with 500ml of methanol by maceration for 72h. The methanol extracted was concentrated in a rotary evaporation and thereafter preserved for further use.

### Phytochemicals screening

Chemical test were carried out in the methanol extracts for the qualitative determination of Phytochemicals constituents as described by Harborne (1973), Trease and Evans (1989) and Sofowora (1993).

### Total phenolic content

Total phenolic content was determined using Folin-Ciocalteu reagent. Test solution of methanol extract in different concentration (25 to 100mg/ml) was mixed with 10% folin-Ciocalteu reagent (v/v) and 2.0ml of 7.5% sodium carbonate. The reaction mixture was incubated at

45°C for min and the absorbance measured at 765nm in the spectrophotometer, Gallic acid was used as standard phenol (MC Donald et al. 2001). The total phenol activity was obtained using the formula  $C = \frac{A_s \times c.S}{A.C}$  Where C is the total content of phenolic in the methanol extract sample in mg/g gallic acid equivalent. As is the absorbance of sample, c.S is the concentration of standard and A.C is the absorbance of standard. 0.1mg/ml was used as the concentration of gallic acid. The total phenolic content was calculated for gallic acid and different concentrations of methanol extract. Each test was carried out thrice.

### DPPH radical scavenging activity

The free radical scavenging activity of methanol extract was measured with stable 1, 1-diphenyl-2-picrylhydrazyl radical (DPPH) spectrophotometrically (Blois, 1958). 0.004%. DPPH solution was prepared in methanol. Test solution of methanol extract was prepared in different concentration (25 to 100mg/ml). The absorbance was read at 507nm. About 500µl of extract of different concentrations were added to 2.950ml of DPPH solution taken in a cuvette. The sample were kept in the dark for 30mins and reading were measured at 517nm. The scavenging activities was observed by bleaching of DPPH solution from violet color to light yellow. Ascorbic acid was used as control and 500µl methanol as blank. The DPPH radical scavenging was calculated in terms of percentage inhibition using the formula  $\% \text{ inhibition} = \frac{100(A_c - A_s)}{A_c}$ . Where  $A_c$  is the absorbance of the blank and  $A_s$  is the absorbance of the sample. The % inhibition was calculated for ascorbic acid and different concentrations of methanol extracts kept in the dark for 30mins. Each test was carried out thrice.

### Free Reducing Antioxidant Properties (FRAP)

This was determined according to the method of Oyaizu (1986). Different concentration of the methanolic extract of *F.aestuans* (25, 50, 75, and 100mg/ml) in 1ml of distilled water was mixed with phosphate buffer (2.5 ml, 0.2M, PH 6.6) and potassium ferricyanide (2.5ml, 1%). The mixture was incubated at 50 °C for 20 min. Trichloroacetic acid (10%, 2.5) was added to the mixture was mixed with FeCl<sub>3</sub> (0.1%, 0.5ml) and the absorbance was measured at 700nm in a spectrophotometer. Higher absorbance of the reaction mixture indicates higher reductive potential.

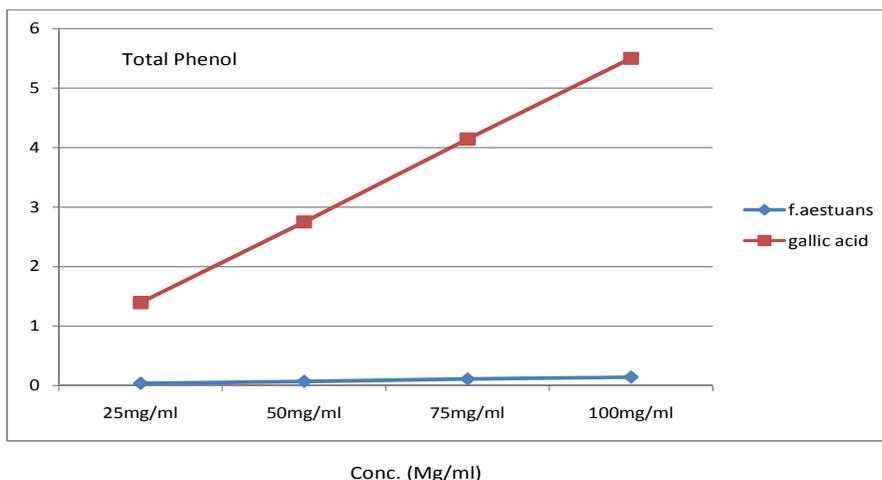
### Statistical analysis

Data were expressed as mean ± SEM. A one-way analysis of variance was used to analyze data.

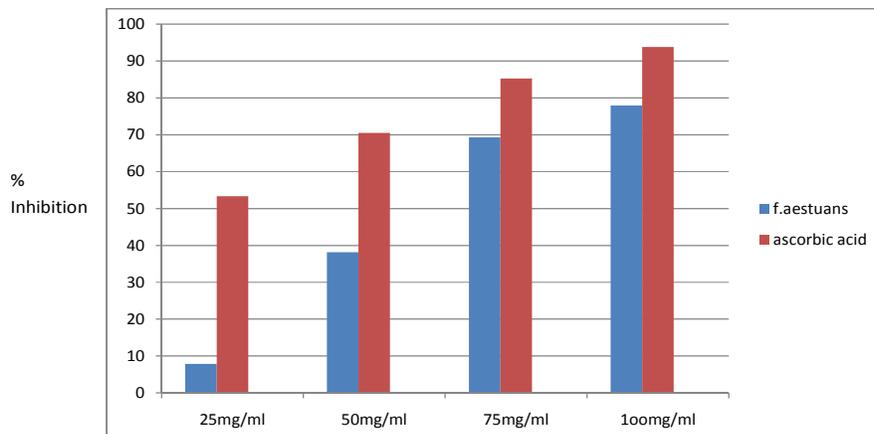
**Table 1.** Phytochemicals screening of the methanolic leaves extract of *flueyaaestuan*

Antraquinones	Tannins	Saponins	Flavonids	Alkaloids	Sterols	Glycosides
-	+	+	+	+	+	+

Note; + = present and - = absent



**Figure 1.** Dose-dependent total phenol potential of *flueyaaestuans* and gallic acid.

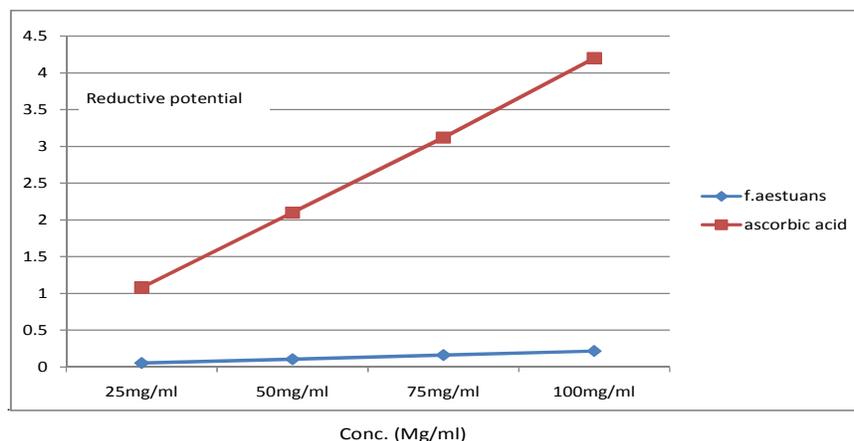


**Figure 2.** Dose-dependent DPPH scavenging potential of *flueyaaestuans* and ascorbic acid

**RESULT AND DISCUSSION**

Table 1 shows the phytochemicals detected in *f.aestuans* plant extract. Test for cardiac glycosides, tannins, saponins, flavonoids, sterols and alkaloids were positive in the methanol extracts. Anthraquinones were not detected in the methanol extracts. This secondary metabolite may be responsible for the medicinal value of *f.aestuans*. The methanol leaves extracts of this plant shows in fig. 1 the total phenolic contents of the plant leaves extract at different concentrations. The total phenol content was seen to increase gradually with

increase in concentration of methanol extract. However, the total phenol activity was low in comparison with known standard garlic acid. Phenolics are the largest group of phytochemicals and have been touted as accounting for the most antioxidant activity of plants. The result of the DPPH scavenging activity of *f.aestuans* extract compared to that of ascorbic acid is shown in fig. 2. Both shared a dose dependent antioxidant activity. The % inhibition of ascorbic acid was higher than that of *f.aestuans* at lower concentration but significant differences between seem to be less conspicuous at higher concentration. The reductive potential of



**Figure 3.** Dose-dependent reductive potential of flueyaaestuans and ascorbic acid.

f.aestuans extract and ascorbic acid were also dose-dependent as shown in figure 3. It was observed that the reductive potential of ascorbic acid was conspicuous than that of f.aestuans at all concentrations. But, it should note that the reductive potential of f.aestuans was still appreciable. Results from the present study shows that f.aestuans is rich in phytochemicals. Biologically, important compound have been identified in extract from the roots and leaves of the plant by previous workers (Tatiana, 2008, Mengome et al, 2009).

## CONCLUSION

The present work reveals that the extract from the laeves of f.aestuans possesses good antioxidant constituents. These facts justified the medicinal use of the plant for treatment of malaria, colonic, ulcer, toothache, snake poison, constipation diuretic, etc. (Hutchinson and Dalziel, 1963). Moreover, further work is necessary to ascertain the clinical safety of extracts from the plants (Effrain et al., 2001) and to determine appropriate concentration for the therapy so as to safeguard the health of the teeming mass of user who more often than not, does not take these factors into consideration.

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