International Journal of Biology Research
ISSN: 2455-6548, Impact Factor: RJIF 5.22
www.biologyjournal.in
Volume 2; Issue 3; July 2017; Page No. 20-22

Qualitative Phytochemical Analysis of *Gomphrena globosa* Linn. and *Gomphrena decumbens* Jacq.

*** P Yamuna, P Abirami, M Sharmila, P Vijayashalini**

PG and Research, Department of Botany, Vellalar College for Women, Thindal, Erode, Tamil Nadu, India

Abstract
The present study is aimed to test entire plant parts of ethanol and aqueous extracts of Qualitative Phytochemical analysis of *Gomphrena globosa* Linn. and *Gomphrena decumbens* Jacq. It reveals the presence of tannins, phenols, saponins; absence of flavanoids, Quinones, Terpenoids and Cardio glycosides in *Gomphrena globosa* and *Gomphrena decumbens* of both ethanol and aqueous extracts.

Keywords: qualitative, *g. globosa*, ethanol, aqueous, tannins

Introduction

Traditional medicine has been used for centuries by herbalists, healers, spiritualists, hunters and farmers as a primary health care at community level. Herbalist, healers, spiritualists, hunters and farmers use indigenous plants for treating and averting illnesses and are believed to be a basis for primary health care provision. Traditional medicine has been shown to be effective and about 60% of rural population depend on it for their primary health care (WHO 1978 and Akinyami *et al*., 2000) [1, 2]. Traditional medicines apply the familiarity, experience and practices based on the ideas and beliefs to its ethos, for preservation of well-being. It holds a custom of community agreement, and is uniquely based on the knowledge achieved by community herbalists, healers, spiritualists, hunters, and farmers at a particular period of time within a geographical region.

Medicinal plants are a major natural alternative to synthetic drugs, and nowadays, native plant usage in traditional as well as modern medicine is gaining a lot of attention (Karthishwaran and Mirunalini 2012) [3]. The medicinal plants are useful for healing as well as for curing of human diseases because of the presence of phytochemical constituents (Nostro *et al*., 2000) [4]. Phytochemicals are naturally occurring in the medicinal plants, leaves, vegetables and roots that have defense mechanism and protect from various diseases. Phytochemicals are primary and secondary compounds. Chlorophyll, proteins and common sugars are included in primary constituents and secondary compounds have terpenoid, alkaloids and phenolic compounds (Krishnaiah *et al*., 2007) [5]. Terpenoids exhibit various important pharmacological activities i.e., anti-inflammatory, anticancer, anti-malarial, inhibition of cholesterol synthesis, anti-viral and anti-bacterial activities (Mahato and Sen 1997) [6]. Terpenoids are very important in attracting useful mites and consume the herbivorous insects (Kappers *et al*., 2005) [7]. Alkaloids are used as anaesthetic agents and are found in medicinal plants (Herouart *et al*., 1988).

With this connection, the study has selected two medicinal plants *Gomphrena decumbens* Jacq. and *Gomphrena globosa* Linn. were selected to analyze the qualitative phytochemicals.

Materials and Methods

Collection of Plant materials

The entire plants parts of *Gomphrena decumbens* Jacq. and *Gomphrena globosa* Linn.. were collected from Erode district, Tamil Nadu, India and were authenticated and deposited at the PG and Research Department of Botany, Vellalar College for Women, Erode (Tamil Nadu), India. Fresh plants were collected and air-dried at room temperature and then homogenized to obtain coarse powder. The powdered test plants was extracted (Mukherjee, 2002) [9] with the solvent ethanol by hot extraction using soxhlet apparatus, collected and stored in a vial for further analysis.

Preparation of plant extracts

Hot water extraction

5gm of dried finely powdered plant materials was taken in a beaker and 200ml of distilled water was added. The mixture washed on a hot plate with continuous stirring at 30º- 40ºC for 20 minutes. Then the water extract was filtered through filter paper and the filtrate was used for the phytochemical analysis. The water extract was kept in refrigerator when not in use.

Solvent extraction

Crude plant extracts was prepared by Soxhlet extraction method. About 20gm of powdered plant material was uniformly packed into a thimble and extracted with 250ml of ethanol solvent separately. The process of extraction continues for 24 hours or till the solvent insiphon tube of an extractor become colorless. After that the extract was taken in a beaker and kept on hot plate and heated at 30-40ºC till all the solvent got evaporated. Dried extract was kept in refrigerator at 4ºC for their future use in phytochemical analysis.

Qualitative Phytochemical analysis

Phytochemicals are naturally occurring and biologically active plant compounds that have potential disease inhibiting capabilities. Plants are endowed with various phytochemical screening of proteins, alkaloids, terpenoids, tannins, flavonoids, saponins, steroids, cardiac glycosides and quinine present in the powder entire plants parts of *Gomphrena decumbens* and *Gomphrena globosa* in ethanol and water extracts were carried

out the following standard procedure of Harborne 1973 [10], Edeoga *et al*., 2005 [11].

Tests for Proteins
1 ml of sample was taken, to that few drops of Bradford reagent was added and observed for blue colour development.

Test for Tannins
1 ml of sample was taken; to that few drops of 0.1% ferric chloride was added and observed for blue / black colourization / brownish green.

Test for Flavonoids
1 ml of sample was taken, to that concentrated HCL and magnesium chloride was added and observed for pink tomato red colour.

Test for Alkaloids
1 ml of sample was taken, to that few drops of dragandoff reagent was added and observed for orange red colour.

Test for Steroids
1 ml of sample was taken; to that 10% concentrated H_2SO_4 was added and observed for green colour.

Test for Saponins
1 ml of sample was taken, to that 2 ml of H_2O (shaken vigorously) was added and observed for foaming appearance.

Test for Quinones
1 ml of sample was taken, to that aqueous ammonia (shaking) was added and observed for change in colour of aqueous layer (pink, red or violet).

Tests for Terpenoids
1 ml of sample was taken; 2 ml of chloroform and concentrated H_2SO_4 was added and observed for reddish brown ring colour.

Test for Cardiac Glycosides
1 ml extract and glacial acetic acid 0.4 ml and ferric chloride solution and conc. $H_2SO_4$and observed for brown ring colour.

Result and Discussion

Qualitative phytochemical analysis of entire plant parts of ethanol and aqueous extracts of *Gomphrena globosa* Linn. *and Gomphrena decumbens* Jacq.

The qualitative phytochemical analysis of entire plant parts of *Gomphrena globosa* were revealed the presence of some important phytoconsituents like tannins, saponins, steroids, terpenoids, alkaloids and phenols. At the same time the phytochemical constituents like flavonoids, quinones, terpenoids, cardioglycosides were absent. The results of ethanolic and aqueous extract of *Gomphrena globosa* were present. Chemical compounds like tannins, saponins and phenols are present in ethanolic and aqueous extracts. The phytoconstituents flavanoids, quinones, terpenoids, cardioglycosides were absent in both the extracts. Ethanolic extracts shows positive result to alkaloids, proteins and steroids.

Like that of *G. globosa* the ethanolic extracts of *G. decumbens* also shows the positive results to tannins, saponins, alkaloids, proteins, steroids and phenols and negative result to flavonoids, quinones, terpenoids and cardioglycosides. In aqueous extract the tannins, saponins, proteins and phenols are present. But the chemical compounds like flavonoids, alkaloids, steroids, quinones, terpenoids and phenols are totally absent. The presence or absence of constituents are expressed in (+) and (-) symbols.

Table 1: Qualitative Phytochemical analysis of *Gomphrena globosa* Linn. and *Gomphrena decumbens* Jacq.

S. No.	Phyto constituents	Ethanol extract		Aqueous extract	
		Gomphrena globosa	*Gomphrena decumbens*	*Gomphrena globosa*	*Gomphrena decumbens*
1.	Proteins	+	+	-	+
2.	Tannins	+	+	+	+
3.	Phenols	+	+	+	+
4.	Flavonoids	-	-	-	-
5.	Alkaloids	+	+	-	-
6.	Steroid	+	+	-	-
7.	Saponin	+	+	+	+
8.	Quinones	-	-	-	-
9.	Terpenoid	-	-	-	-
10.	Cardioglycosides	-	-	-	-

('+') indicates presence**;** while **('–')** stands for absence.

Similarly Madhu *et al*. (2016) [12] selected 10 medicinally important plant species (*Garcinia indica*; *Jatropha curcas*; *Nigella sativa*; *Levisticum officinale*; *Dracaena loureiri*; *Woodfordia fruticosa*; *Vaccinium macrocarpon*; *Foeniculum vulgare*; *Sapindus saponari* and *Annona squamosa*) were screened for their phytochemicals (quantitatively) by using 4 different solvent (water [AQ], Acetone [AE], Petroleum Ether [PE] and chloroform [CF]) extracted from their selected parts (leaves, stem, and pericarp of the fruit and seeds cotyledons for the study contains phytochemicals like alkaloids, flavonoids, steroids, phenols and saponins. The highest concentrations of alkaloids are observed in *Levisticum officinale* leaf and *Foeniculum vulgare* stem extracts by using PE. The highest amounts of flavonoids are seen in AQ and PE extracts of *Garcinia indica*, *Dracaena loureiri*, and *Sapindus saponaria*. The moderate concentrations of phenols are reported in AQ and PE extracts of *Jatropa curcas* and *Sapindus saponaria* plant species. The high concentrations of steroids are reported in *Sapindus saponaria* plant fruit pericarpic extract with PE. Nnama *et al*. (2016) [13] investigated the phytochemical analysis fresh mature leaf samples of *Erythrina senegalensis*, alkaloids, saponins and

flavonoids, were found in moderate quantities; tannins and terpenoids were found in trace amounts, while cardiac glycosides and steroids were not found.

Ayyadurai and Ramar (2017) [14] investigated the phytochemical analysis of leaves of *Solanum pubescens* shows the presence of alkaloid, glycoside, Saponins, Phenolic compounds Tanins, flavonoids, and shows the absent protein and amino acid. Karunakar (2017) [15] analysed the phytochemical screening (alkaloids, terpenoids, flavonoids, anthraquinones, tannins, saponins, glycosides, pholotannins, steroids, cardiac glycosides and phenol) of *Solanum nigrum* leaf extracts with methanol, ethanol, chloroform, pet ether and water. Methanol extracts reveals the presence of eight phyto compounds except anthraquinones, glycosides and phenol. In ethanol nine phyto compounds are present except anthraquinones and phenol. Eight phyto compounds are present except anthraquinones, tannins and phenol in chloroform and water extracts. In pet ether seven phyto compounds were seen except anthraquinones, tannins, glycosides and phenol.

References

1. WHO. The Promotion and development of traditional medicine. World Health Organization. Technical Report Series No. 1978; 622.
2. Akinyemi KO, Coker AO, Bayagbon C, Oyefolu AOB, Akinside KA, Omonigbehin EO. Antibacterial screening of five Nigerian medicinal plants against *S. typhi* and *S. paratyphi*. Journal of the Nigerian Infection Control Association. 2000; 3(1):1-7.
3. Karthishwaran K, Mirunalini S. Assessment of the antioxidant potential of *Pergularia daemia* (Forsk.) extract in vitro and in vivo experiments on hamster buccal pouch carcinogenesis. Asian Pacific J Trop Dis. 2012; 31(2):509-516.
4. Nostro A, Germanò MP, D'angelo V, Marino A, Cannatelli MA. Extraction methods and bioautography for evaluation of medicinal plant antimicrobial activity. Lett Appl Microbiol. 2000; 30:379-384.
5. Krishnaiah D, Sarbatly R, Bono A. Phytochemical antioxidants for health and medicine: A move towards nature. Biotechnol Mol Biol Rev. 2007; 1:97-104.
6. Mahato SB, Sen S. Advances in triterpenoid research, 1990-1994. Phytochemistry. 1997; 44:1185-1236.
7. Kappers IF, Aharoni A, van Herpen TW, Luckerhoff LL, Dicke M. Genetic engineering of terpenoid metabolism attracts bodyguards to Arabidopsis. Science. 2005; 309:2070-2072.
8. Herouart D, Sangwan RS, Fliniaux MA, Sangwan-Norreel BS. Variations in the Leaf Alkaloid Content of Androgenic Diploid Plants of *Datura innoxia*. Planta Med. 1988; 54:14-17.
9. Mukherjee PK. Quality Control of Herbal Drugs. An approaches to evaluation of botanicals, edition 1st published by Business Horizons, New Delhi. 2002, 390-403.
10. Harbone JB. Phytochemical methods. A guide to modern Techniques of plant Analysis. Chapman and Hall, London. 1973, 267-270.
11. Edeoga HO, Okwu DE, Mbaebie BO. Phytochemical constituents of some Nigerian medicinal Plants. African Journal of Biotechnology. 2005; 4(7):685-688.
12. Madhu M, Sailaja V, Satyadev TNVSS, Satyanarayana MV. Quantitative phytochemical analysis of selected medicinal plant species by using various organic solvents. Journal of Pharmacognosy and Phytochemistry. 2016; 5(2):25-29.
13. Nnama TN, Asomugha AL, Asomugha RN, Umeasalugo KE, Mgbemena IO. Phytochemical Analysis and Acute Toxicological Study of *Erythrina senegalensis* ethanolic leaf extract in Albino Wistar Rats, Anatomy & Physiology. Current Research journal. 2016; 7(1):1-3.
14. Ayyadurai V, Ramar K. Preliminary Phytochemical Analysis of methanolic leaves extract of *Solanum pubescens* Willd., Imperial Journal of Interdisciplinary Research. 2017; 3(1):1746-1749.
15. Karunakar T. Studies on phytochemical analysis of ethanolic extract of leaves of S*olanum nigrum* L. European Journal of Pharmaceutical and Medical Research. 2017; 4(4):378-383.