

---

*Phytochemical contents Of Hibiscus Sabdariffa L (Roselle) and its Medicinal value: A determinant approach.*

---

**Ngoka, Emmanuella Chinecherem**

**Department of Science Laboratory Technology, School of Applied Science**

**Federal Polytechnic, Oko**

**08160465679**

[ngokaemmanuella@gmail.com](mailto:ngokaemmanuella@gmail.com)

**Abstract**

*The study was conducted on the phytochemical composition of Hibiscus sabdariffa L. The dried leaves were ground to fine powder and used for analysis. Results of the phytochemical analysis showed that the leaves contained Flavonoid (28.78%), Saponin (2.8%), Alkaloid (4.64%) and Tannin (9.42%). The result shows that Hibiscus sabdariffa L. (Roselle) has medicinal values and can be used in drug formulation and preparation of drinks especially energy giving drinks.*

**Introduction**

Roselle (*Hibiscus sabdariffa* L.) is a specie of *Hibiscus* native to West Africa. It is used for the production of bast fiber as an infusion, in which it may be known as carcade. It is an annual or perennial herb. The leaves are three to five-lobed, 8-15cm(3-6in) long, and are arranged alternately on the stems.

The flowers are 8-10cm(3-4in) in diameter, white to pale yellow with a dark red spot at the base of each petal, and have a stout fleshy calyx at the base, 1-2cm(0.39-0.79in) wide, enlarging to 3-35cm(12-14in), fleshy and bright red as the fruit matures. They take about six months to mature.

There are two main varieties of *Hibiscus Sabdariffa*, the first being *H. sabdariffa*

var. *altissima* Wester, cultivated for its jute-like fiber and second is *H. sabdariffa* var. *sabdariffa*. The second variety embraces shorter bushy forms, which have been described as races *intermedius*, *albus*, and *ruber*. The first variety, has green, red-streaked, in-edible calyces, while the second and third race have yellow-green edible calyces and also yield fiber (Morton, 1987).

*H. sabdariffa* var. *sabdariffa* race *ruber* is an annual, erect, bushy, herbaceous sub-shrub that can grow up to 8ft (2.4m) tall. *Hibiscus sabdariffa* fiber maybe used as a substitute for "jute" in making burlap. *Hibiscus sabdariffa*, is used in folk medicine as a diuretic and mild laxative.

It is used in food colouring, the green leaves are used as a spicy version of

spinach. It can also serve as vegetables; it is used in the production of beverages and can also be used in herbal medicine.

Phytochemicals are non-nutritive plant chemicals that have disease preventive properties. They are non-essential nutrients that are not required by the human body to sustain life. It is well known that plants produce these chemicals to protect themselves, but recent research demonstrates that they can also protect human against diseases (Rao, 2007). Some of these photochemicals are responsible for colour and other organoleptic properties, such as the deep purple of blueberries and the smell of garlic (Lin et al, 2003). Photochemicals may have biological significance, for example; carotenoids or flavonoids, but are not established as essential nutrients.

There may be as many as 4,000 different phytochemicals (Rao, 2007). Some of the phytochemicals are present in some of the fruits and plants we consume in our everyday lives. Therefore this research will make the public know and understand the nutritional values and the plant chemicals found in roselle leaf (*Hibiscus sabdariffa*).

## **Materials and Methods**

### **Materials:**

*Hibiscus Sabdariffa* L., acetic acid, ethanol, ammonium hydroxide, aqueous methanol, Sodium hydroxide and phenolphthalein.

### **Methods:**

#### **Preparation of *Hibiscus Sabdariffa* Sample:**

*Hibiscus Sabdariffa* leaves were bought from Eke Awka market, Anambra State. 200g of the dried leaves were ground into fine powder and then used for analysis.

#### **Determination of Alkaloids:**

5g of *Hibiscus sabdariffa* L. was weighed into a beaker and 100ml of 20% acetic acid in ethanol was added. The beaker was covered and allowed to stand for 4 hours at room temperature. This was filtered with filter paper, and the filtrate was concentrated using a water bath to one quarter of the original volume. Concentrated ammonium hydroxide was added drop wise to the extract until the precipitation was completed. The whole solution was allowed to settle and then filtered with pre-weighed filter paper. The residue on the filter paper was the alkaloid, which was then dried in the oven and the dried filter paper was weighed when it cooled.

#### **Determination of Flavonoids:**

10g of *Hibiscus sabdariffa* L. was extracted with 100ml of 80% aqueous methanol at room temperature. The solution was filtered with a filter paper. The filtrate was transferred into a pre-weighed crucible and evaporated into dryness over a water bath and was weighed to a constant weight.

#### **Determination of Saponin:**

5g of *Hibiscus sabdariffa* L. was put into 100ml of 20% acetic acid in ethanol and was kept at room temperature for 24 hours. This was filtered, and the extract was concentrated using a water bath to one-quarter of the original volume.

Concentrated ammonium hydroxide was added drop-wise to the extract until the precipitate was complete. The whole solution was allowed to settle and the precipitate was collected by filtering the solution with a pre-weighed filter paper.

#### **Determination of Tannin:**

To 20g of *Hibiscus sabdariffa* L. in a beaker, was added 100ml of petroleum ether and was covered for 24hours. The sample was filtered with a filter paper and was allowed to stand for 15minutes allowing petroleum ether to evaporate. It was re- extracted by soaking in 100ml of 10% acetic acid in ethanol for 4hours. The sample was filtered and the filtrate collected.

25ml of ammonium hydroxide was added to the filtrate to precipitate the alkaloids. The alkaloids was heated with electric hot plate to remove some of the ammonium hydroxide still in the solution. The remaining volume was measured to be 33ml. 5ml of this was taken and 20ml of ethanol was added to it.

It was titrated with with 0.1M NaOH using phenolphthalein as an indicator, until a pink end point is reached.

#### **Discussion:**

*Hibiscus Sabdariffa* L, contained flavonoid, saponnin, alkaloid, and Tannin. The presence of these phytochemicals in *Hibiscus Sabdariffa* L, are likely to be responsible for its medicinal uses. Flavonoids are known to be responsible for the protective effect against the risk of many diseases, such as cancer, cardiovascular and circulatory disease, diabetes and Alzheimer's disease (Reaubourg and Monceaux, 2006).

Tannins fights diarrhea, prevent heart diseases and cancer, disable bacteria in the mouth and prevent tooth decay.

Saponins which helps to lower cholesterol, improves immune functioning and prevent cancer (Hostettmann et al, 2005).

Alkaloids helps to relax the muscle, dilate the pupils of the eyes and cures muscular diseases (Hesse, 2011).

#### **Recommendations:**

Futher research should be done on *Hibiscus Sabdariffa* L. to ascertain the type and nature of the colouring matter present in the leaves.

There should be research on use of *Hibiscus Sabdariffa* in the production of beverages.

#### **References:**

- Hesse, .F (2011). Plant Phytochemical constituents. *Plant Science and phytomedicine*, 62(5); 3075-3082.
- Hostettmann, .K, Miranda- Sanchez J, Avila-Castro .D, Herrera Alvarez .S, and Jimenez- Ferrer J. E (2005). Handbook of saponnins, 63(7); 32-36.
- Lin, H.H, Chan K.C, Sheu J.Y, Hsuan S.W, Wang C.J and Cheng J.H (2012).*Hibiscus Sabdariffa* leaf induces apoptosis of human Prostate cancer cell in vitro and in vivo.*Food Chemistry*, 132(2); 880- 891.
- Morton, J.F (1987). Fruits of warm climates. Florida, Flair Books; 59.

Rao, M.B.V.N (2007). Chromosome numbers in two species of Hibiscus (H. Sabdariffa and H. Cannabinus). Current science, 4(4); 162-175.

Reaubourg, .G, and Monceaux R.H (2006). The chemical, botanical and pharmacological characteristics of the karkade (rosella) Hibiscus Sabdariffa (gossypifolius). J Pharm Chim, 1; 292- 305.

