CHARACTERIZATION AND PRELIMINARY STRUCTURAL ELUCIDATION OF FLAVONOIDS IN THE SEED OF TELFAIRIA OCCIDENTALIS.

ABSTRACT

Extraction and characterization of flavonoids in the seed of *Telfairia Occidentalis* were carried out. Flavonoids were extracted from the seeds of *Telfairia Occidentalis*. The extracted flavonoid was characterized using thin layer chromatography (TLC) to obtain the R_f values of various flavonoids, U.V analysis was also done on the extracted flavonoids. The R_f values of various flavonoids were coupled with different colors they are shown under ultraviolet light (U.V).

This analysis helped identify isolated flavonoids such as Vitexin, Gossypetin, Queceptin, and Kaempterol with R_f values of 6.00, 26.00, and 63. 00, and 88. 00 and color of Absorbed, Black, Bright yellow and yellow respectively. One of the isolated flavonoids with an R_f value of 37.00 and Dull yellow color cannot be identified because; it has no match in the reference book.

KEYWORDS: Telfairia Occidentalis seed, Flavonoids, Characterization and Elucidation.

INTRODUCTION

There has been an extraction and characterization of phytochemicals on the leave, seeds, or bark of plants or vegetables. This phytochemical possesses medicinal properties used to treat various diseases and they are anthraquinones, flavonoids, steroids, tannins, saponins, etc (Chevalier, 2002). Flavonoids, terpenoids, and alkaloids compounds are used as drugs or to prevent numerous diseases stated by Raskin et al, and in some cases to prevent and inhibit differesuch nt types of cancer (Reddy et al., 2003). The active substance differs from plant to plant, for instance, the plant belonging to the family of *Asclepiadaceae* is rich in steroid glycosides, alkaloids, flavonoids, enzymes, and triterpenes (Bazzaz et al., 2003) while papaya contains glycosides, lectins, saponins, flavonoids, and steroids (Krishna et al., 2008; Ayoola and Adeyeye, 2010).

Telfairia Occidentalis (T. Occidental is) is a known plant for its nutritional and medicinal properties, some findings on this plant stated its richness in carbohydrates, proteins, vitamins, oils, minerals, and fiber (Fasuyi, 2006), and its phytochemical evaluation reveals that it encompasses flavonoids, glycosides, alkaloids, and resins. A previous study by Akubue et al reveals the presence of tannins, reducing sugar, glycosides, saponins, and sterols in the root of Telfairia Occidentalis, this study is not limited to the root but also the seed.

The seed of T. Occidentalis can be utilized in various ways, including industrial. Nutritional and medicinal ways. The fermented flour of Telfairia cotyledons can be processed into seasonings, marmalade, high-

protein infant weaning food mixtures, and different local products in West Africa (Egbekun et al., 1998). Also, the flour of the seed and milk from soybean was used to produce a textured vegetable protein (tofu) (China et al 2021). Furthermore, it comprises 3.00% of moisture, 35.58% of ash, 10.20% of crude fiber, and 42.27% carbohydrates (Alozie et al., 2017) and is a good source of calcium, iron, zinc, and vitamins needed in human nutrition (Kayode and Kayode, 2011). Eseyin et al. reported the antioxidant property of the seed of T.Occidentalis after identifying a free radical scavenging activity, two pure compounds(9-octadecenoic acid and 10-hydroxyoctadecanoic acid), and four oily isolates. Unlike other parts of the plants, the seed possesses flavonoids, alkaloids, saponins, terpenoids, steroids, and anthraquinones (Osukoya et al., 2016). Several numbers of compounds have been isolated from the seed of Telfairia Occidentalis including flavonoids but this is the first report to isolate and identify the types of flavonoids present in the seed of *Telfaira Occidentalis.*

The purpose of this study was to isolate flavonoids using TLC and U.V analysis as a technique and was characterized through their R_f values and colors shown in UV light, as well as comparison with the reference book.

2.0 MATERIALS AND METHODS

SOURCE OF MATERIAL AND IDENTIFICATION

Theplant material (*Telfairia Occidentalis*) was collected from Uga, Aguata Local Government Area Anambra state Nigeria. In April 2018. It was identified by Dr. Tony, Biological Department Anambra State University Uli. The plant was dried at room temperature (25°C), pulverized by the use of an electronic grinding machine, and stored in a well-covered plastic container for use.

Chemical and solvent used

Methanol

Chloroform

Ethyl acetate

Water

Equipment used/Apparatus used

Silica TLC glass plate-1Ocm length by 5cm width.

Aluminum foil

Chromatographic chemper 500ml capacity

Capillary spotter

UV transilluminator

Weighing balance

Beaker

Stirrer

Stopwatch

Crucible

Water bath

Spatula

Measuring cylinder

Filter paper (Whatman).

2.1 SAMPLE PREPARATION

The seeds of *TelfairiaOccidentalis* were collected from farmland in Uga, the seeds were dried and then powdered.

Extraction of flavonoid

2g of the sample was weighed and poured into a 250ml beaker, 80% aqueous methanol was added at room temperature and then stirred. It was allowed to stay for 2 hours. The whole solution was filtered through a Whatman. The whole process was repeated 3 times. The filtrates were transferred into three crucibles and, evaporated to dryness in a water bath, weighed.

The percentage of flavonoid was calculated as the weight after drying divided by the weight of the sample used multiple by 100 over 1

That is flavonoid %= Weight after drying ÷ Weight used × 100/1

Characterization of flavonoid in the seeds of *TelfairiaOccidentalis*.

Procedure:

Thin layer chromatography method.

A horizontal line (2cm above the base silica TLC plate) was drawn with a pencil.1Oml of the sample was collected using a capillary spotter and spotted on the line drawn on the plate (two different spots were made in different positions on the Same plate).

The mobile phase (Chloroform: Ethyl acetate: Water in the ratio of 30:15:2) was poured into the Chromatographic chemper making sure it was 1cm below the pencil mark or sample spot.The glass plate with the spotted sample was placed into the chemper, and the chemper covered with aluminum foil, and finally with its glass cover, and allowed to stand for 6 hours. After separation, the silica glass plate was removed and a pencil was used to mark the height reached by the solvent front horizontally, then the plate was allowed to dry. The glass plate was placed in a beaker containing Iodine crystals for 2mins. The different spots of the sample components were visualized in a UV transilluminator at 365nm wavelength and several spots and their corresponding color were recorded, then the distance moved by each of the components (spots) was measured and recorded using a meter rule, and a pair of dividers.

Rf (retardation factor) values were calculated and recorded using the below formula:

$$Rf = \frac{\text{Distance traveled by sample.}}{\text{Distance traveled by the solvent}} = \frac{\text{Sample front}}{\text{Solvent front}}$$

Finally, the corresponding components/ isolates Separated were identified by comparing their R_f values with the standard retardation factor values of standard known compounds given with known R_f values in literature.

2.2 CONFIRMATORY TEST FOR FLAVONOID

The sample extract was taken in a test tube and a few drops of dilute NaOH solution. An intense yellow color appeared in the test tube. It became colorless when the addition of a few drops of dilute acid indicate the presence of flavonoids.

3.0 RESULTS

Table.1: ORGANOLEPTIC CHARACTERIZATION OF SEED OF TELIFFARIA OCCIDENTALIS

Parameters	**Inference**
Colour	**Milk color**
Texture	**Powdery and soft**
Odor	**Unobjectionable**

Table 2: PERCENTAGE YIELD OF FLAVONOID IN THE SEEDS OF TELIFFARIA OCCIDENTALIS

NUMBER OF DETERMINATIONS

1st	**2nd**	**3rd**	**Mean value %**	**Sample**
9.75	**9.1**	**9.15**	**9.13**	**FLAVONOID**

Table .3: CHARACTERIZATION OF FLAVONOD WITH REFERENCE TO R_f VALUE AND UV ANALYSIS.

ISOLATES	**SOLVENT FRONT CM**	**SAMPLE FRONT CM**	**Rf VALUES**	**RfX 100**	**U.V COLOUR**	**COMPONENTS IDENTIFIED**	**SAMPLES**
A	**7.9**	**0.5**	**0.06**	**6.00**	**ABSORBED**	**VITEXIN**	**FLAVONOID**
B	**7.9**	**2.1**	**0.26**	**26.00**	**BLACK**	**GOSSYPETIN**	**FLAVONOID**
C	**7.9**	**2.95**	**0.37**	**37.00**	**DULE YELLOW**	**UNKNOWN**	**FLAVONOID**

D	**7.9**	**5.00**	**0.63**	**63.00**	**BRIGHT YELLOW**	**QUECEPTIN**	**FLAVONOID**
E	**7.9**	**7.00**	**0.88**	**88.00**	**YELLOW**	**KAEMPTEROL**	**FLAVONOID**

Discussion

Table 1, showed the physical characterization of the seeds of *TelfairiaOccidentalis*. It is milky in color and has an Unobjectionable Odour.

Table .2, showed the mean value of flavonoid in the seeds of fellfaria Occidentalis.

Table3 showed the characterization of flavonoids of *TelfairiaOccidentalis* extracts seeds.

The characterization was done with reference to R_f values and UV analysis

The extracted metabolite was characterized using Chromatographic and UV light instruments to obtain different types of flavonoids in the seeds of the plant. This table exposed the characterization of the isolated flavonoids. The thin layer Chromatographic test of the flavonoid revealed five spots with the calculated R_f values to be 6. 00, 26.00, 37.00, 63.00, and 88.00 respectively. These R_f values of the isolated metabolite were coupled with the various color they showed under ultraviolet (UV) light. These help in the identification of this metabolite, the Visible colors observed are Absorbed, Black, Dule yellow, Bright yellow, and Yellow respectively. This analysis helps to identify the isolated flavonoid to be Vitexin, Gossypetin, Quecetin, and Kaempterol respectively expect the isolated flavonoid with the R_f value of 37.00 and Dule yellow color which has no match in the reference book.

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