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Original Research Article

PRELIMINARY PHARMACOGNOSTIC EVALUATION OF ETHANOL EXTRACT OF LEAF OF *OLAX SUBSCORPOIDEA* OLIV (OLACACEAE)

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ABSTRACT

One of the most common objections leveled against natural products is a lack of standardization, necessitating the exploration of various quality control approaches aimed at proving the safety and quality of crude medications. The purpose of this study was to assess the quality of *Olax subscorpoidea* leaves. The ethanol extract of *Olax subscorpoidea* leaves was obtained by the maceration process. Chemo-microscopy and physicochemical examination (moisture content, total ash value, acid insoluble ash, water soluble ash, extractive values) of the crude drug were performed using established procedures. The presence or absence of starch, mucilage, calcium oxalate, cellulose, and lignin was determined to deduce various microscopic traits with chemical reagents. The crude drugs qualitative phytochemical investigation disclosed the presence of tannins, saponins, flavonoids, alkaloids, phenols, terpenoids, steroids, and cardiac glycosides. Quantitative phytochemical analysis revealed that the plant extract had more alkaloids and saponins than the other phytoconstituents present. Chemomicroscopy of *Olax subscorpoidea* leaves indicated the presence of starch, mucilage, cellulose, calcium oxalate, and lignin. The physicochemical study of *Olax subscorpoidea* ethanol leaf extract indicated moisture content (8±0.03%) and total ash content (0.15±0.01%), respectively. The extractive value also revealed that polar solvents are most suited for extracting the crude drug. This study was able to provide useful information that aids pharmacognostic standardization, thereby building a scientific platform to buttress the quality of *Olax subscorpoidea* powdered leaf and its ethanol extract for ease of formulation and commercialization.

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INTRODUCTION

There has been a connection between life, illness, and plants from the beginning of mankind; for this reason, medicinal plants must be studied [1]. A significant amount of commercial medications used today for the treatment and prevention of the majority of diseases are still based on substances derived from plants. Because medicinal plant treatments have little adverse effects, they are regarded as quite safe. It is important to remember that most herbal

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formulations are harmful due to a combination of factors, including improper plant material collection practices, the inclusion of contaminants in the form of silicates and phosphates in most crude medications, and a lack of knowledge regarding the shelf life of crude pharmaceuticals. It is necessary to investigate the characteristics of crude medications to assess them. This will help identify, purify, and improve the quality of the crude medication that is being investigated. According to data from the World Health Organization (WHO), 80% of people on the planet heavily rely on medicinal plants for their basic medical needs. A fundamental understanding of natural compounds derived from plants is essential for the creation of new drugs [2]. Some issues, including inadequate standardization, identification, and isolation of the bioactive compounds, as well as a lack of clarity regarding the mechanisms underlying pharmacological activities and clinical trials, are major obstacles to the use of natural products as therapeutic agents [3].

The *Olax subscorpioidea* Oliv. A plant is a tree or shrub that is a member of the Olacaceae family. It has a height of at least 10 metres. In Senegal, Zaire, Nigeria, and other regions of Africa, the plant is widely dispersed [4]. When fully grown, the shrub becomes woody with leafy branches, pale blooms, and spherical, brilliant yellow fruits. The Yorubas call it ifon, and Hausas call it Gwaanon kurmi or Gwaanon raafii. In Igbo, it is commonly known as Igbulu, Atu-ogili, or Osaja. Other tribes in Nigeria such as Edo and Igala call it Ukpakon and Ocheja respectively. [5, 6].

The roots of the plant have been commonly used due to its aphrodisiac effect. Topically, it can be used for curative activities against cutaneous and subcutaneous parasitic infections [7], inflammatory and mental diseases, convulsions, pain, and cancer, while a decoction of the plant's stem, bark, and leaves has been used to treat rheumatism and articular pains in some African countries such as the Congo Republic [8]. In South-Western Nigeria, the roots are used in a decoction to treat diabetes, obesity, and asthma and as an ideal recipe for cancer management, the stem barks are used in this region to maintain dental hygiene [9,10]. It is also vital to emphasize the role of *Olax subscorpioidea* leaves in Nigerian traditional medicine as a therapy for treating Alzheimer's disease [11] and depression [12], postpartum haemorrhage, arthritis, constipation, and other prevalent diseases [13]. This study aims to standardize *Olax subscorpoidea* leaf to ensure its quality for formulation and commercialization.

MATERIALS AND METHODS

Materials

The apparatus used during this research includes a hot air oven (Leader Engineering St Helens Merseyside WAS), Water Bath (Laptop Instrument PVT, India), Analytical Balance (SHIMADZU Model: ATY224 Philippines), Spectrophotometer (B.Bran Scientific & Instrument Company, England), Refrigerator, Dessicator, Muffle furnace (Techmel & Techmel, Texas, USA), Ashless Filter paper (Whatmann International Ltd, Maidstone, England).

The following chemicals, reagents, and drugs were used during this research work: Ethanol, Hydrochloric acid (JHD, Guangdong Schi-Tech Ltd, China) Phloroglucinol, ruthenium red, iodine, sulphuric acid (JHD, Guangdong Schi-Tech Ltd, China).

Collection and Authentication of Plant Materials

The leaves of *Olax subscorpoidea* were obtained in July 2023 from the botanical garden of the Department of Pharmacognosy and Traditional Medicine, Faculty of Pharmacy, Delta State University, Abraka. Following the process of leaf collection, a taxonomist, Dr. Henry Akinnibosun verified the authenticity of the leaves. Voucher number UBH-0519 was assigned to the leaves of *Olax subscorpoidea.*

Plant Extract Preparation

The leaves of *Olax Subscorpoidea* were dried at room temperature for one week. Using a clean blender, the dried plant was ground into a fine powder. The powder particles were blended and then carefully preserved in a refrigerator until their extraction was required.

Extraction of Powdered Plant materials

An analytical weighing balance was used to weigh 750 grams of the dried, coarsely powdered drug material, which was then transferred into a container. The drug substance was covered entirely by the absolute ethanol that was poured on top. After that, the container was sealed and left for a minimum of 72 hours [14]. Periodically, the content was swirled to guarantee full extraction. Filtration was used to separate the micelle from the marc after extraction. In a bid to reduce the menstruum content of the extract, the resultant filtrate was evaporated in a water bath at a temperature of 60^{o}C [15]. The concentrated extract was preserved in a refrigerator at a temperature of 4^{o}C.

Determination of Moisture Content

The moisture content of the crude drug was deduced following the method of Nwankwo *et al.* [16]. Two grams (2 g) of the powdered sample was placed on the porcelain dish, and both the weight of the powdered sample and the porcelain dish were duly recorded and subsequently placed in a hot air oven to dry the powdered sample. The dried plant was weighed. This process was repeated continuously until a continuous weight is obtained. The percentage moisture content was calculated using Equation 1.

$$\text{Percentage Moisture Content} = \frac{W_2}{W_1} \times 100 \ldots\ldots \text{Equation 1}$$

where W_2 = Final weight of the powdered sample, W_1= Initial weight of the powdered sample

Determination of Total Ash Value

According to the methods of Nwankwo and Obokare [17], the total ash content of the crude drug was ascertained. Two empty crucibles were heated in a hot air oven, this was followed by noting the weight of the crucibles. Two grams (2 g) of the powdered sample was carefully measured into each crucible and placed inside the muffle furnace at 700^{o}C for 2 hours. After two hours, the crucible was expunged from the muffle furnace, the total ash was weighed and recorded, and its corresponding percentage was calculated.

Determination of Acid Insoluble Ash

The procedures of Nwankwo and Obokare [17] was used to evaluate the acid-insoluble ash. In this method, 40% dilute HCl was prepared. Two grams (2 g) of the powdered sample was burned at 550^{o}C for 30 minutes with the aid of a muffle furnace. The crucible was removed from the furnace, and observed for any carbon content. A second burn was carried out due to the presence of carbon after the first burn. 25 ml of the 40% HCl was added into the crucible containing the carbon-free ash. After boiling, an ashless filter paper was used to filter the carbon-free ash solution while it was still warm. The trapped particles on the filter paper after filtration are considered as acid insoluble ash. The filter paper containing the acid-insoluble ash was placed into a furnace and heated at 550^{o}C for 90 mins. The crucible containing the ash was weighed and the acid-insoluble ash percentage was calculated.

Determination of Water-soluble Ash

The methods of Nwankwo and Obokare [17] were used to determine the water-soluble ash of the pulverized crude drug. The crucible was dried using a hot air oven. After cooling, the empty crucible was weighed and recorded. Two grams (2 g) of the powdered sample was added to the crucible, and placed in the muffle furnace until it became red hot. The weight of the covered crucible and ash was recorded, and distilled water (25 ml) was added to dissolve the ash. Filtration was done using Ashless filter paper. The filter paper retained water-insoluble ash while the filtrate contained the water-soluble ash. The insoluble ash was also incinerated and the water soluble ash was calculated as the difference between the water-insoluble and total ash. Finally, the corresponding percentage of water-soluble ash was estimated regarding the initial weight of the powdered sample evaluated.

Determination of Extractive Values Using Different Solvents

The extractive value of the powdered *Olax subscorpoidea* leaves was evaluated following the method of Nwankwo and Obokare [17]. A 5 g powdered plant was measured and transferred to a dry 250 ml conical flask. Five (5) 100 ml graduated flasks were filled with 90% ethanol, water, acetone, dichloromethane, and methanol, and emptied into conical flasks containing the powdered plant. The conical flasks were agitated repeatedly during the first 6 hours and then allowed to stand for 18 hr. Filtration is performed after 24 hours. The filtrate in each porcelain dish was evaporated to dryness in a water bath, and the drying was completed in a hot air oven at 100^{o}C. To keep the dried extract cool, it was transferred to a desiccator. The cooled dried extract in all porcelain dishes was weighed, and the percentage (w/w) extractive value was calculated.

Qualitative Phytochemical Analysis

The plant extract was carefully assessed for the existence of various secondary metabolites. The availability of alkaloids, tannins, saponins, glycosides, steroids, quinones, flavonoids, anthraquinones, terpenoids were evaluated using standard methods [17]

Quantitative Phytochemical Analysis

Determination of Alkaloids

Following the techniques of Ejikeme *et al*. [18], 200 ml of 20% acetic acid was added to 5 g of the pulverized leaf drug in two hundred and fifty mililitres (250 ml) beaker and covered for 4 hours. The solution-containing mixture was filtered and reduced to one-quarter volume using a water bath. Concentrated ammonium hydroxide was applied to the material in drips until it precipitated completely. The entire solution was allowed to settle, and then the precipitate was filtered and weighed. The percentage of total alkaloid content was computed using Equation 2.

$$\text{Percentage of total alkaloid} = \frac{W_R}{W_S} \times 100 \ldots\ldots \text{Equation 2}$$

Where W_R = Weight of residue, W_S= Initial weight of the powdered sample

Estimation of Tannin Content

According to the reports of Ejikeme *et al*. [18], the tannin content of plant extract was estimated using Folin-Denis reagent. One gram of the powdered sample was dissolved in 100 cm^3 of distilled water. The solution was boiled for 1 hour and filtered. Thereafter, 50 cm^3 of distilled water and 10 cm^3 of diluted extract (aliquot volume) were added to a conical flask with the aid of a pipette. This was followed by addition of 5 cm^3 Folin-Denis reagent and 10 cm^3 sodium bicarbonate solution.

Afrer properly mixing the solution, the solution was heated in a water bath at a temperature of 25^{o}C. A spectrum Lab23A spectrophotometer was used to measure the optical density at a wavelength of 700 nm. A standard tannic acid curve was used to compare the optical density (absorbance). The tannic acid curve was prepared by dissolving 0.20 g of tannic acid in distilled water and diluted to 200 cm^3 mark. Varying concentrations of the standard tannic acid solution ranging from 0.2-1.0 mg/cm^3 were measured into five different test tubes. 5 cm^3 of Folin-Denis reagent and 10 cm^3 of sodium bicarbonate was added to each test tube and made up to the

100 cm^3 mark with distilled water. The resultant solution in the test tubes were heated in a water bath at a temperature of 25°C for 30 minutes. Optical density was measured at a wavelength of 700 nm and a plot of optical density (absorbance) against concentration of tannic acid was made. The tannin content was calculated using Equation 3.

$$\text{Tannic acid } \left(\frac{\text{mg}}{100\text{g}}\right) = \frac{\text{C} \times \text{V}_{\text{EXT}} \times 100}{\text{V}_{\text{AQ}} \times \text{W}_{\text{S}}} \ldots\ldots \text{Equation 3}$$

where C = concentration of tannic acid extrapolated from the graph, V_{AQ}= Aliquot volume, W_S= Weight of the sample, V_{EXT}= Extract volume

Estimation of Saponin Content

Saponin was measured using the methods described by Ejikeme *et al.* [18] and Obadoni and Ochuko [19]. Five (5) grams of the powder sample was mixed with precisely 100 cm^3 of 20% aqueous ethanol. The mixture was cooked in a hot water bath at 55◦C for 4 hours, with constant stirring. After filtering, the mixture was re-extracted with 100 cm^3 of 20% aqueous ethanol and heated for 4 hours at a temperature of 55◦C with constant stirring. The extract was evaporated to 40 cm^3 in a water bath at 90°C. In a 250 cm^3 separator funnel, 20 cm^3 of diethyl ether was forced into the concentrate, exposing the aqueous layer and discarding the ether layer. The purifying process was repeated twice. 60 cm^3 of n-butanol was used, followed by two extractions using 10 cm^3 of 5% sodium chloride. After removing the sodium chloride layer, the remaining solution was boiled in a water bath for 30 minutes before being transferred to a crucible and oven-dried to a consistent weight. The percentage saponin content was calculated with reference to the initial weight of the sample under investigation using Equation 4.

$$\text{Percentage of total saponin} = \frac{\text{W}_\text{X}}{\text{W}_\text{Y}} \times 100 \ldots\ldots \text{Equation 4}$$

where W_X = Weight of saponin, W_Y = Initial weight of the pulverized drug

Estimation of Cardiac Glycoside Content

In cardiac glycoside estimation, the method of Amadi *et al.* [20] as reported by Ejikeme *et al.* [18] was adopted. Four grams (4 g) of the pulverised plant was weighed into a 250 cm^3 round bottom flask and about 200 cm^3 of distilled water was added to one gram of the dry leave powder sample and allowed to stand for 2 hours for autolysis to occur. Full distillation was carried out in a 250 cm^3 conical flask containing 20 cm^3 of 2.5% NaOH (sodium hydroxide) in the sample after adding an antifoaming agent (tannic acid). Cardiac glycoside (100 cm^3), 8 cm^3 of 6 M NH_4OH (ammonium hydroxide), and 2 cm^3 of 5% KI (potassium iodide) were added to the distillate(s), mixed, and titrated with 0.02 M $AgNO_3$ (silver nitrate) using a micropipette against a black background. Continuous turbidity indicated the endpoint. The content of cardiac glycoside in the sample was calculated using Equation 5.

$$\text{Cardiac glycoside } (\text{mg}/100\text{g}) = \frac{\text{TV } (\text{cm}^3) \times 1.08 \times \text{V}_{\text{EXT}}}{\text{V}_{\text{AQ}}(\text{cm}^3) \times \text{W}_\text{S} \text{ (g)}} \times 100 \ldots\ldots \text{Equation 5}$$

where TV = Titre value, V_{EXT} = Extract volume, V_{AQ}= Aliquot volume, W_S = Weight of sample

Total Phenolic Content

The total phenolic content of *Olax subscorpoidea* leaves was determined using Singleton's Folin-Ciocalteau reagent technique [21]. To prepare the solution, 20 µg of the leaf extract was combined with 1 mL of distilled water. Then, 500 µL of diluted Folins-phenol reagent (1:1 ratio with water) and 2.5 ml of 20% sodium carbonate Na_2CO_3 were added. The mixture was thoroughly mixed before being incubated in the dark for 40 minutes to allow for color development. Following incubation, the absorbance was measured at 725 nm. A calibration curve of gallic acid was constructed and linearity was obtained in the range of 10-50 µg/ml. The total phenolics content in the plant extract was expressed as mg of gallic acid equivalent (mg GAE/g extract) by using the standard curve. The extract was analyzed in triplicate.

Total Flavonoid Content

The total flavonoid content was assessed using the method reported by Pham *et al.* [22]. The extract (1 g) was diluted with 200 µl of distilled water. Sodium nitrite solution (150 microlitres) diluted to 5% was also incorporated into the mixture which was later incubated. After 5 minutes of incubation, 150 µl of 10% aluminium chloride solution was added and allowed to stand for 6 minutes. Then, 2 ml of a 4% sodium hydroxide solution was added and diluted with distilled water to get 5 ml. The mixture was thoroughly shaken before being allowed to rest at room temperature for 15 minutes. The absorbance was measured at an exact wavelength of 510 nm. The appearance of pink indicated the presence of flavonoids. The overall flavonoid concentration was given as quercetin equivalent mgQuE/g. This was used as a standard of the extract on a dry weight basis using the standard curve. The extract was analyzed in triplicate.

Qualitative Chemo-microscopy

Chemomicroscopy is a thorough analysis of the anatomical structures of crude medicines. The microscopic features of both powdered plant samples were examined using the procedures outlined below. This test was done on a powdered plant sample to determine the presence or absence of lignin, starch, mucilage, calcium oxalate, and

cellulose[23].

Test for Lignin
Two drops of phloroglucinol and HCl were mixed into the powdered plant on the slide. This was placed on a microscope stage with the magnification correctly adjusted to guarantee proper viewing; following the viewing, a pink tint indicated the presence of lignin.

Test for Starch
Two drops of N/50 iodine were applied to the powdered sample and placed on a slide, which was then covered. The fine and coarse adjustments were properly adjusted. Each sample was carefully examined and evaluated for the presence of blue-black color.

Test for Mucilage
A few drops of ruthenium red were applied to the powdered plant sample on a slide. The slide was placed on the microscope stage to check for pink coloration, which indicates the presence of mucilage.

Test for Cellulose
Three drops of 0.05 M iodine and 80% sulfuric acid were added to a slide containing powdered *Olax subscorpoidea* leaves. This was appropriately covered with a slide cover, placed on a stage, and examined under a microscope to look for the occurrence of a bluish-black color, which indicates the presence of cellulose.

Test for Calcium Oxalate
The powdered plant was placed on a microscopic slide, concentrated HCl was applied, and the slide was placed on the microscope stage to see the structure of calcium oxalate, which disappears instantly.

RESULTS

Yield Percentage of Ethanol Extract from *Olax subscorpoidea* Leaves

The powdered leaf utilized in this investigation weighed 750 grams. The weight obtained after extraction and concentration was 90 grams. Thus, the ethanol leaf extract of O*lax subscorpoidea* has a yield of 12%.

Phytochemistry Analysis
Table 1 shows the presence or lack of phytoconstituents in an ethanol extract of *Olax subscorpoidea* leaves. Alkaloid, saponin, cardiac glycoside, terpenoid, tannin, steroid, flavonoid and phenol were present while quinone and anthraquinone glycoside were absent. Table 2 clearly shows the quantity of some of the phytoconstituents present in *Olax subscorpoidea* ethanol leaf extract.

Result of Chemo-microscopic Evaluation of *Olax subscorpoidea* Leaves
The chemomicroscopy results revealed that *Olax Subscorpoidea* leaves contain starch, mucilage, cellulose calcium oxalate, and lignified tissues (Table 3).

Physicochemical Analysis
The analysis of the physicochemical properties of the crude drug revealed minimal moisture content and impurities as stated in Table 4. The table also revealed the extractive values using different solvents.

DISCUSSION

The yield of the *Olax subscorpoidea* ethanol leaf extract was 12%. This can be attributable to one of the following factors: the powdered drug's low diffusion rate, the moisture level of the crude drug, or the existence of competing extractable components. It could also be due to an unbalanced liquid-solid ratio or the type of extraction solvent. In a study conducted by Ezeani *et al.* [7], the yield of the ethanol extract of the crude drug was 9.50%, which is substantially identical to this latest study.

The qualitative phytochemical examination revealed the presence of alkaloids, saponins, cardiac glycosides, terpenoids, tannins, steroids, flavonoids, and phenols. There was no sign of quinone or anthraquinones. These findings are consistent with those of Wisdom *et al.* [13], who confirmed the presence and absence of the aforementioned phytoconstituents in the ethanol leaf extract of *Olax subscorpoidea*. Similarly, Dzoyem *et al.* [24] found no anthraquinone glycosides in the hydroethanolic root extract. Fankam et al. reported the presence of anthraquinones in both methanol and fruit extract.

The quantitative phytochemical analysis found a significant amount of alkaloid and saponin (7.5±0.05% and 7.6±0.75% respectively). Cardiac glycosides, flavonoids, tannins, and phenol were detected in small amounts (1.58±0.08 mg/100g, 2.6±0.05 QuE/g, 2.63±0.12 mg, 1.82±0.01 mgGAE/g). This contradicts Konan *et al.'s* [13] findings, which found much higher levels of total phenol and flavonoids in the hydro-ethanol extract of *Olax subscorpoidea* leaves. Certain factors have been discovered as determinants of medicinal plants' phytochemical profiles, these factors include seasonal/climatic fluctuations, genetic polymorphisms, altitudinal soil composition, and microbial burden.

Chemo-microscopy tests show the presence of starch, cellulose, mucilage, and calcium oxalate. Chemo-microscopy of crude drugs is an important part of standardization. In general, these diagnostic traits have been widely used in crude drug identification at both the genus and species levels. As a result, understanding the microscopic features seen on powdered drugs aids in the accurate distinction of closely related species from each other.

The physical constants employed in crude drug evaluation are crucial factors for determining the incidence of

adulteration or inappropriate drug storage [25]. According to the reports of Shehu *et al.* [26], the standard requirement for crude drug moisture content is ≤14%. The moisture content of *Olax subscorpoidea* leaves was 8±0.03%, which falls within the standard requirement. This value indicates minimal or no tendency for microbial degradation or spoilage. High moisture content in crude drugs can cause the breakdown of essential ingredients as well as the proliferation of microbes, particularly during medication storage. Since *Olax subscorpoidea* leaves have a very lengthy shelf life, long-term storage can be recommended.

Table 1: Result of qualitative phytochemical analysis

S/N	Phytochemicals Analysed	Status
1	Alkaloid	+
2	Saponin	+
3	Cardiac Glycosides	+
4	Terpenoids	+
5	Tannins	+
6	Steroids	+
7	Flavonoids	+
8	Phenol	+
9	Quinones	-
10	Anthraquinone Glycosides	-

Note: + indicates presence, - indicates absence

Table 2: Result of quantitative phytochemical analysis

S/N	Phytochemicals	Quantity
1	Alkaloid	7.50±0.05%
2	Saponin	7.60±0.75%
3	Cardiac Glycoside	1.58±0.08 mg/100mg
4	Tannin	2.63±0.12 mg/100g
5	Flavonoid	2.60±0.05 mgQuE/g
6	Phenol	1.82±0.01 mg GAE/g

Table 3: Chemomicroscopy of *Olax Subscorpoidea leaves*

Parameter	Result
Lignified tissues	Absent
Starch	Present
Mucilage	Present
Cellulose	Present
Calcium oxalate	Present

Table 4: Result of the Physicochemical Evaluation of Powdered Sample of *Olax subscorpoidea* leaves

Physicochemical parameters	Values (%)
Moisture content (Mean± SEM)	8±0.03
Extractive value (Ethanol soluble)	20±0.81
Extractive value (Water soluble)	26.4±0.04
Extractive value (Methanol soluble)	25.2±0.01
Extractive value (Acetone soluble)	3.9±0.08
Extractive value (Dichloromethane soluble)	1.2±0.03
Total ash (Mean± SEM)	0.15±0.01
Acid insoluble ash (Mean± SEM)	0.04±0.01
Water soluble ash (Mean± SEM)	0.09±0.01

Extractive values are a very important tool in the evaluation of crude pharmaceuticals since they show the nature of the chemical elements present. Extractive values, a type of physicochemical parameter utilized in the quality control of crude drugs, can be used to correctly predict the most suitable extracting solvent. Five different solvents with different levels of polarity were utilized to determine the extractive values of the crude drug: water, ethanol, methanol, dichloromethane, and acetone. Extractive values from various solvents are commonly used to determine the quality and purity of crude pharmaceuticals, as well as to detect adulteration caused by expired and poorly handled drugs [27]. Various solvents were utilized to correctly forecast which solvent will most likely extract a higher yield of phytoconstituents, hence from the results of the extractive value (Table 3), water, methanol, and ethanol soluble extractive value (26.4%, 25.2%, and 20%w/v) produced a higher yield of *Olax subscorpoidea* ethanol leave extract when compared to acetone (3.9%) and dichloromethane (1.2%) extractives.

Ash values are important for determining foreign inorganic matter that emerges as contaminants in crude medicines. Phosphates, carbonates, sodium silicates, potassium, magnesium, and other inorganic components of ash all have an impact on the quality of crude drugs. *Olax subscorpoidea* ethanol leaf extract has a total ash concentration of 0.15±001, indicating low levels of foreign inorganic radicals in crude medicines. Detecting these contaminants contributes to the correct standardization of both basic pharmaceuticals. However, because these foreign inorganic variables that make up the total ash are entirely soluble in acid, they can be eliminated by treatment with dilute hydrochloric acid. Therefore, the acid-insoluble ash of both crude pharmaceuticals was assessed to determine the amount of foreign inorganic matter that cannot be removed with acid. Acid insoluble ash values indicated the level of contamination of the crude drugs with siliceous materials [28]. The results (Table 3) showed that both plant extracts contained only trace amounts of contaminants after being treated with hydrochloric acid. The water-soluble ash values of both crude medications revealed extremely few contaminants, confirming their acceptable quality.

CONCLUSION

The present study evaluates the phytochemical, chemo-microscopic, and physicochemical properties, which provides useful information for pharmacognostic evaluation and thus establishes a scientific basis for buttressing the quality nature of *Olax subscorpoidea* ethanol leave extract for ease of formulation and commercialization.

CONFLICT OF INTEREST

None

AUTHORS' CONTRIBUTION

Concept and Design of work- LUN and JEA Experimental procedures – BBI, EUE and LUN Manuscript writing- LUN and BBI Proofreading of Manuscript - OOO and JEA. Supervision- LUN

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