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Phytochemical Screening of Spinacia Oleracea and as Medicinal Raw Materials

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Abstract
The increase in universal role of plants in the treatment and medicinal value of Spinacia oleracea for cure of disease is a great concern to public health. Various derived compounds have been used as drugs Spinacia oleracea in this study employ in all the major systems of medicine irrespective of the underlying philosophical premise. the plant showed a significant presence of phenolic compounds such as tannins, complex compounds, and lots of secondary metabolites obtained from the result of phytochemical screening and qualitative analysis, the results of the phytochemical analysis of aqueous extracts of Spinacia oleracea, which reveals the presence of tannins, alkaloids, flavonoids, Saponin, Terpenoids, and protein which are present while starch is found to be negative.

Keyword: Spinacia Oleracea, Phytochemical Screening, Flavonoids, Terpenoids, And Phenols, Saponin

Introduction
The universal role of plants in the treatment of disease is exemplified by their employment in all the major systems of medicine irrespective of the underlying philosophical premise. How and when such medicinal plants were first used is, in many cases, lost in pre-history, indeed animals other than man, appear to have their own Materia medica (*Wanzala.et al.,2023*). Nevertheless, it can be said with certainty that vegetable kingdom already existed when man made his appearance on earth. As man began to acquire closure acquaintance with his environment, he began to know more about plants, as these were the only curative agents he had. As he progressed and evolved, he was not only able to sort out which plants could be eaten, but also began to associate curative characteristics with certain plants.

The World Health Organization (*Rausch. et.al., 2024*) estimated that 4 billion people (80%) of the world population presently use

herbal medicine for one form of primary health or another. Early human recognized their dependence on nature for a healthy life and since that time, humanity has depended on the diversity of plant resources for food, clothing, shelter, and medicines to cure myriads of ailments. However, man did not require the modern methods of investigation to collect for himself a material medica of plants which he often used in conjunction with magical and other ritual practices. It is interesting to reflect that such collection of herbal medicines compiled over centuries by trial and error, and presumably using the patient as the experimental animal throughout, must surely contain some materials worthy of further investigation and should not be too readily discarded.

Medicinal plants are of great value in the field of treatment and cure of disease. Over the years, scientific research has expanded our knowledge of the chemical effects and composition of the active constituents which determine the medicinal properties of plants (*Izah. et.al.,2024*). It has now been a universally accepted fact that the plant drugs and remedies are far safer than synthetic medicines for curing complex diseases (*Salau. Et.al., 2024).* Large numbers of alkaloids, glycosides, and antibiotics have been isolated, identified and used as curative agents. In the western world, as people are becoming aware of the potency and side effects of synthetic drugs, there is an increasing interest in the plant-based remedies with a basic approach towards the nature. The future development of Pharmacognosy as well as herbal drug industry would be largely dependent upon the reliable methodologies for identification of marker compounds of the extracts, and also upon the standardization and quality control of these extracts.

RESULTS

In table 1, the organoleptic evaluation was shown while the macroscopic examination was shown in table 2. The Phytochemical screening of *Spinacia oleracea* were presented in table 3.

Table 1: Organoleptic Evaluation

S/N	Characteristics	Parts		
		Leaf	**Stem**	**Root**
1	Color	Green	Light green	Grayish brown
2	Taste	Slightly bitter	Bitter	Bitter
3	Odor	Fresh, earth green	Fresh, metallic flavor	Fresh, metallic flavor
4	Texture	Coriaceous	Smooth, Coriaceous	Rough

From table 1 above, the organoleptic evaluation of the plant shows that the leaf part is green in color, the stem is light green and the root is grayish brown in color. The leaf tastes slightly bitter while the stem and root parts taste bitter. Also, the leaf part has a fresh/earth-green odor while the stem and root parts both have a fresh/metallic flavor. In addition, the leaf part has a coriaceous texture while the stem and root parts have smooth/coriaceous and rough textures respectively.

Table 2: Macroscopic Examination

S/N	Characteristic	Part
1.	Shape	Spade-shaped/oval
2.	Apex	Acute
3.	Venation	Reticulate
4.	Base	Cuneate
5.	Margin	Entire
6.	Petiole	Petiolate

Table 3: Phytochemical Screening

Tannins	Alkaloid	Flavonoids	Saponin	Terpenoids	Protein	Starch
+	+	+	+	+	+	–

Key: + = *Present*
– = *Absent*

The phytochemical screening of *Spinacia oleracea* in table 3 above shows that tannins, alkaloids, flavonoids, saponins, Terpenoids, and proteins are all present, while starch is found to be negative.

Discussion

Table 3 showed the results of the phytochemical analysis of aqueous extracts of *Spinacia oleracea,* which reveals the presence of tannins, alkaloids, flavonoids, Saponin, Terpenoids, and protein which are present while starch is found to be negative.

The phytochemical analysis of *Spinacia oleracea* showed various metabolites present which demonstrated antimicrobial activities against all the tested microbe species, this result is in agreement with the traditional use of this plant in Nigeria to treat bacterial infections (*Edo, et al., 2024; Komolafe et al., 2024; Singh. et al., 2024*). Phytochemical compounds present includes tannins which were in the extract as well as Saponin, alkaloids, and flavonoid to a varying degree.

The different phytochemical constituents identified in the aqueous extracts of *Spinacia oleracea* are considered significantly important biologically active compounds of plant origin. This may be important in the discovery of new therapeutic agents, especially at this time when the scientific community is preoccupied with searching for an alternative treatment to combat the increasing threat of drug-resistant micro-organisms.

Conclusion

The result shows that *Spinacia oleracea* is no doubt a potential plant that can be useful in pharmaceutical and medical science to make drugs that can prevent myriad diseases.

Recommendations

Since the plant showed a significant presence of phenolic compounds such as tannins, complex compounds, and lots of secondary metabolites obtained from the result of phytochemical screening and qualitative analysis, it is necessary to expand the work to carry out antioxidant and antidiarrheal activities of the plant extract. In addition, a toxicity assay is required to determine the toxicity level of the plant extract.

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