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Phytochemical and antioxidant potential of the crude extracts of *Ipomoea quamoclit*

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Abstract
The emergence of new chronic and infectious diseases has spurred intense research efforts to identify new and effective substances for combating these global health challenges. Plants have been widely acknowledged as a principal source of drug discovery due to their remarkable ability to produce a diverse array of bioactive molecules. Thus, this study aimed to investigate the phytochemical and antioxidant potential of the crude extracts obtained from different parts of *Ipomoea quamoclit*. Various parts of *I. quamoclit* were collected, ground, dried, and processed into a coarse powder. Subsequently, solvent extraction using methanol and ethyl acetate was performed to obtain the extracts. The methanolic extract (ME) of the plant's leaves exhibited a higher phenolic content (6.097±0.189 mg/g of GAE) compared to the ME of the root (4.515±0.1884 mg/g of GAE). Additionally, the ethyl acetate extract (EAE) of the leaves showed a higher flavonoid content (12.815±0.234 mg/g of CAE) compared to the EAE of the root (11.229±3.558 mg/g of CAE). Moreover, the ME of the stem displayed a higher antioxidant capacity (41.488±0.684 mg/g of AAE) than the ME of the leaves (37.133±5.604 mg/g of AAE). The DPPH radical scavenging activity of the ME of the stem of *I. quamoclit* was 64.050%, comparable to that of BHT (77.48%). These findings indicate that *I. quamoclit* holds promise as a valuable source of phytochemicals and antioxidant compounds.

Keywords: *Ipomoea quamoclit*, extracts, antioxidant, phytochemicals

1. Introduction
The search for new and effective substances involves exploring various sources, including medicinal plants, microorganisms, and synthetic compounds. Scientists are leveraging advanced technologies and methodologies to identify and characterize these substances and evaluate their efficacy against different diseases. These efforts hold great promise for the development of new drugs and treatments that can address the pressing health issues facing our global population [1]. Medicinal plants, in particular, have long been recognized as a promising source for drug discovery diverse range of diseases [2]. They have been used for centuries in traditional medicine systems and have provided the basis for many modern pharmaceuticals. The exploration of medicinal plants involves various stages, including plant collection, extraction of bioactive compounds, isolation and purification of specific molecules, and evaluation of their pharmacological properties.

The rich biodiversity of plants enables the production of a diverse range of bioactive compounds that have the potential for therapeutic benefits. The various chemical constituents found in medicinal plants offer a wide array of pharmacological properties that can be harnessed for the development of new drugs and treatments [3]. Furthermore, medicinal plants often contain a combination of bioactive compounds that may work synergistically to produce therapeutic effects. This complexity can provide advantages such as multiple mechanisms of action, reduced toxicity, and improved efficacy compared to single-compound drugs.

Phytochemicals, also known as secondary metabolites, are bioactive compounds synthesized by plants. They are not directly involved in the plant's primary functions but play important roles in defense against pathogens, pests, and environmental stressors. Phytochemicals are found in various parts of plants, including flowers, bark, leaves, roots, fruits, seeds, and stems. Each plant species can produce a unique combination and concentration of phytochemicals, leading to the diverse chemical profiles observed among different plants. Some of the common classes of phytochemicals include alkaloids, flavonoids, terpenoids, phenolic compounds, and glucosinolates. These compounds exhibit a wide range of biological activities and have been of great interest in drug discovery and the development of natural remedies.

They have demonstrated various beneficial properties, including antioxidant, anti-inflammatory, antimicrobial, antiviral, and anticancer activities. Their potential as therapeutic agents has led to extensive research into their mechanisms of action and applications in preventing and treating diseases [1]. The exploration and understanding of phytochemicals have been instrumental in drug discovery and the development of natural remedies for various diseases.

Ipomoea quamoclit, commonly known as Cypress vine or Cardinal climber, is a flowering plant species belonging to the family Convolvulaceae. The leaves of *I. quamoclit* are fern-like, deeply dissected, and arranged alternately along the stem. They are usually bright green and have a delicate, airy appearance. The plant's slender, twining stems can reach lengths of up to 10 feet (3 meters) or more. The flowers of *I. quamoclit* are small but striking, typically measuring about 1 inch (2.5 centimeters) in diameter. They have a trumpet-like shape with five petals and are predominantly bright red, although variations in color, such as pink or white, can also occur. *I. quamoclit* produces fruit capsules that contain small, black seeds. The seeds are usually dispersed by wind or through human intervention, as the plant is commonly cultivated and propagated for its ornamental qualities [4].

I. quamoclit is native to tropical and subtropical regions of the Americas, including North, Central, and South America. Its natural range extends from the southern United States, including states like Florida and Texas, down through Mexico, Central America, and into South America, including countries like Brazil, Colombia, Venezuela, and Peru. The plant has been widely cultivated and naturalized in various parts of the world with suitable climates, including parts of Europe, Asia, and Africa [5-9]. The widespread cultivation and adaptability of *I. quamoclit* have allowed it to be introduced and thrive in diverse geographical locations across the globe.

In addition to its ornamental value, *I. quamoclit* has also been used in traditional medicine systems. Various parts of the plant, including leaves, stems, and seeds, have been reported to have medicinal properties. It has been used in folk remedies for conditions such as intestinal disorders, fevers, and skin ailments. Diverse groups of phytoconstituents have been discovered from *I. quamoclit*, including cyanogenetic and glycosides, alkaloids, jalapin and quamoclins, ergoline alkaloids, pyrrolizidine alkaloids, and anthocyanins. These phytoconstituents contribute to the plant's medicinal properties and are of interest in research and drug development [10, 11].

However, the phytochemical composition and antioxidant potential of this plant have not been thoroughly investigated. It is important to note that further scientific research is needed to validate these traditional uses and explore the potential therapeutic benefits of *I. quamoclit*. Therefore, the primary objective of this research was to assess the phytochemical constituents and antioxidant capacity of the *I. quamoclit* extract. By conducting this study, a better understanding of the bioactive compounds present in the plant and their potential antioxidant effects can be gained.

2. Materials and Methods

2.1 Plants Collection: For this research, the collection of *I. quamoclit* plants was carried out in various locations within the Pabna district of Bangladesh. To ensure accuracy, the plant materials were identified and authenticated by knowledgeable botanists based on their morphological characteristics. Once collected, the plant samples were air-dried under sunlight for a duration of approximately 20 days. After drying, the plant materials were carefully cut into small pieces and crushed using a domestic blender to obtain a powdered form. The powdered samples were then stored in airtight containers, which were subsequently used for the preparation of extracts in the research study.

2.2 Preparation of Extract: To obtain a fine powder, the dried plant material was manually sieved. The fine powder was then subjected to solvent extraction using methanol and ethyl acetate. In the methodology, 50 grams of the root, stem, and leaves powder of *I. quamoclit* were taken separately in conical flasks. To each flask, 250 ml of methanol was added, and the mixture was shaken for approximately 90 minutes using a mechanical shaker. The resulting mixture was left to stand for 4 hours at room temperature with continuous stirring. Afterward, the liquid portion was transferred to a separate glass beaker, and another 250 ml of methanol was added. The process was repeated. Similarly, the plant stem, leaves, and root powder were placed in another conical flask and extracted with 250 ml of ethyl acetate following the same procedure as used for methanol extraction. To ensure maximum extraction, the samples were extracted three times. The extracted sample was kept in the dark for 72 hours with intermittent shaking. After incubation, the solution was filtered using Whatman filter paper No. 1, and the resulting filtrate was dried at room temperature. The collected gel-like extracts, known as crude extracts, were stored in airtight containers for further analysis, including antioxidant and phytochemical tests.

For smooth working, the samples were coded as follows

Table 1: Sample code for different plant parts of *I. quamoclit*.

Sample code	Abbreviation
IPOLM	ME of leaves of *I. quamoclit*
IPOLEA	EAE of leaves *I. quamoclit*
IPORM	ME of the root of *I. quamoclit*
IPOREA	EAE of the root of *I. quamoclit*
IPOSM	ME of stem of *I. quamoclit*
IPOSEA	EAE of stem of *I. quamoclit*

2.3 Chemicals

In this research study, all the chemicals used were of analytical grade. The specific chemicals utilized included: Folin–Ciocalteu reagent (FCR) (Lobachemie Pvt. Ltd., India), 2,2-diphenyl-1-picrylhydrazyl radical (DPPH) (Tokyo Chemical Industry, Japan), Potassium ferricyanide (Smart Lab, Indonesia), Methanol (Pristine chem, Dhaka), Ethyl acetate (Daejung Chemicals & Metals Co. Ltd, Korea), Gallic acid (Wako pure chemicals Ltd., Japan), Sulphuric acid (Scharlab S. L., Spain), Aluminium chloride (Qualikems Fine Chem, India), Butylated hydroxytoluene (BHT) (Merck, Germany) and Potassium acetate (Merck, Germany). Besides this, ammonium molybdate, sodium carbonate, ascorbic acid, and ferric chloride (Sigma Chemical Company, USA) were also used in this study. These chemicals were selected based on their quality and purity to ensure accurate and reliable results in the experiments conducted for the research.

2.4 Total Phenolic Content (TPC): The TPC of the extractives was determined using the method described by Ainsworth EA and Gillespie KM [12]. In this experiment, the phenolic compounds present in the plant extracts were oxidized by the FCR, and gallic acid (GA) was used to establish a standard curve. The phenolic content of the plant

parts was expressed as gallic acid equivalents. In the methodology, 0.4 ml of the extract solution was mixed with 2 ml of FCR reagent solution (diluted 10 times with water) in each test tube. The reaction was initiated by adding 2 ml of a sodium carbonate solution (7.5%). The test tubes were then vortexed for 20 seconds to ensure thorough mixing. After incubating the tubes for 20 minutes at 25 °C, the absorbance of the resulting solution was measured at 760 nm using a UV spectrophotometer (Model: T 60, Origin: United Kingdom) against a blank solution. This experiment was repeated three times to ensure the accuracy and reproducibility of the results.

2.5 Total Flavonoid Content (TFC): The TFC of the extractives was estimated using the aluminum chloride colorimetric method developed by Chandra S *et al.* [13]. According to this method, 1.5 ml of methanol and 100 µl of a 10% aluminum chloride solution were added to 0.5 ml of the extract. Additionally, 100 µl of a 1M potassium acetate solution and 2.8 ml of distilled water were added to the mixture, which was then kept at room temperature for 30 minutes to allow the reaction to occur. The absorbance of these mixtures was measured at 420 nm using a spectrophotometer against a blank solution. To calculate the catechin equivalent (CAE) content of flavonoids in the sample, a standard curve was constructed using catechin as a reference compound. The results were expressed as mg of CAEs/gm of extract. To ensure accuracy, the procedure was repeated three times, and the average values were reported.

2.6 Total Antioxidant Capacity (TAC): The total antioxidant assay of the extract was evaluated using a method developed by Prieto P *et al.* [14], with minor modifications as described by Mashwani Z *et al.* [15]. This test is based on the conversion of Mo (VI) to Mo (V) by the samples and the formation of a green-colored phosphate/Mo (V) complex at acidic pH. In the procedure, 0.5 ml of the sample solution was mixed with 3 ml of a reaction mixture consisting of 28 mM sodium phosphate, 0.6 M sulfuric acid, and 1% ammonium molybdate in test tubes. The test tubes were capped with cotton plugs and incubated for 10 minutes at 95°C to allow the reaction to take place. After cooling the tubes to room temperature, the absorbance of the resulting mixture was measured at 695 nm using a spectrophotometer against a blank solution. The antioxidant capacity was determined using a standard curve constructed with ascorbic acid as the reference compound. The results were expressed as milligrams of ascorbic acid equivalents (AAEs)/gm of extract. The average value of the results was calculated from three independent experiments to ensure accuracy and reproducibility.

2.7 Reducing Power Capacity (RPC): The RPC of the extractives was determined following the method described by Do QD *et al.* [16]. In this procedure, 0.25 ml of the sample solution at different concentrations (ranging from 12.5 to 200 µg/ml) was mixed with 0.625 ml of a 1% (w/v) potassium ferricyanide solution and 0.625 ml of a 0.2 M phosphate buffer in test tubes. After thorough mixing, the mixtures were incubated for 20 minutes at 50°C. Next, 0.625 ml of a 10% (w/v) trichloroacetic acid solution was added to each mixture to terminate the reaction. The resulting mixture was then centrifuged for 10 minutes at 3000 rpm. Subsequently, 1.8 ml of the supernatant was withdrawn from the test tubes and mixed with 1.8 ml of distilled water and 0.36 ml of a 0.1% $FeCl_3$ solution. The absorbance of the reaction mixture was measured at 700 nm using a spectrophotometer against a blank solution. Ascorbic acid was used as a standard for comparison. A higher absorbance of the reaction mixture indicates increased reducing power. The assay was performed in triplicate to obtain accurate and reliable measurements.

2.8 DPPH Radical Scavenging Capacity: The free radical scavenging capacity of the different extractives was evaluated using the DPPH assay, following the method described by Karadag A *et al.* [17]. Briefly, sample solutions at various concentrations (ranging from 12.5 to 200 µg/ml) were mixed with a freshly prepared 0.004% DPPH methanol solution. The reaction mixtures were thoroughly shaken and allowed to incubate in the dark at room temperature for 30 minutes. After incubation, the absorbance values of the reaction mixtures were recorded at 517 nm using a spectrophotometer against a blank solution. The percentage of inhibition activity, which indicates the free radical scavenging activity of the extracts, was calculated based on the absorbance values. In this experiment, BHT was used as the standard compound for comparison. A lower absorbance value corresponds to a higher free radical scavenging activity of the extracts. The assay was performed in triplicate to ensure accurate and reliable results.

3. Results

3.1 Determination of Total Phenolic Content

The TPC of the leaves stem, and root extracts of *I. quamoclit* obtained using both methanol and ethyl acetate solvents was determined using the FCR with GA as the standard. A standard curve constructed with GA was used for the calculation of the phenolic content of the extractives. The results were expressed as milligrams of GAE/gm of dried extractive.

Table 2: TPC of the extract of different parts of *I. quamoclit*.

Plant Samples	Average Phenolic Content (mg/g of GAE) ± Standard Deviation (SD)
IPOLM	6.097±0.189
IPOLEA	3.921±0.194
IPORM	4.515±0.188
IPOREA	3.725±0.114
IPOSM	4.438±0.091
IPOSEA	2.060±0.064

In this present research study, it was found that the *I. quamoclit* extract obtained from methanol solvent had a higher phenolic content compared to the EAE. Specifically, the extract obtained from methanol such as IPOLM showed a phenolic content of 6.097±0.189 mg/g of GAE, IPORM had a phenolic content of 4.515±0.1884 mg/g of GAE and IPOSM exhibited a phenolic content of 4.438±0.091 mg/g of GAE. In contrast, the EAE such as IPOSEA exhibited the lowest phenolic content of 2.060±0.064 mg/g of GAE.

3.2 Determination of Total Flavonoid Contents

In this research study, the aluminum chloride colorimetric method was followed to determine the TFC of the *I. quamoclit* extracts where (+)-catechin (CA) was used as the standard compound. Standard curve for (+)-catechin was used for the calculation of the flavonoid content of the extracts. The results were expressed as milligrams of CAE/gm of dried extract.

Table 3: TFC of the extract of different parts of *I. quamoclit*.

Plant Samples	Average Flavonoid Content (mg/g of CAE) ± Standard Deviation (SD)
IPOLM	9.388±1.167
IPOLEA	12.815±0.234
IPORM	4.731±0.584
IPOREA	11.229±3.558
IPOSM	6.595±0.692
IPOSEA	8.966±0.825

According to the research findings, it was observed that the EAE of different parts of *I. quamoclit* had higher flavonoid content compared to the ME. Among the extracts, IPOLEA exhibited the highest flavonoid content with a value of 12.815±0.234 mg/g of CAE. This was followed by IPOREA with a flavonoid content of 11.229±3.558 mg/g of CAE and IPOSEA with a flavonoid content of 8.966±0.825 mg/g of CAE. On the other hand, IPORM displayed the lowest flavonoid content of 4.731±0.584 mg/g of CAE.

3.3 Determination of Total Antioxidant Capacity

Antioxidants play a crucial role in protecting cells from damage caused by unstable molecules known as free radicals [18]. The effectiveness of antioxidants is often attributed to the presence of phenolic compounds, including phenolic acids and phenolic diterpenes. These compounds exhibit redox properties that enable them to absorb and neutralize free radicals, as well as decompose peroxides.

Table 4: TAC of the extract of different parts of *I. quamoclit*.

Plant Samples	Average Antioxidant Capacity (mg/g of AAE) ± Standard Deviation (SD)
IPOLM	37.133±5.604
IPOLEA	18.733±2.343
IPORM	32.333±1.866
IPOREA	17.4±6.07
IPOSM	41.488±0.684
IPOSEA	17.8±6.070

In this research study, the phosphomolybdenum method was followed to determine the TAC of Ipomoea leaves, stem, and root extracts, using both methanol and ethyl acetate solvents [7, 8]. This method relies on the ability of antioxidant molecules to reduce Mo (VI) to Mo (V), leading to the formation of a green-colored phosphate/Mo (V) complex at acidic pH. The TAC of the extracts was calculated based on the standard curve for average antioxidant capacity (mg/g of AAE). The results were expressed as mg/g of AAE of the dried extract.

The study findings indicate that the ME of various parts of *I. quamoclit* demonstrated higher antioxidant capacity compared to the EAE. Among the different parts, IPOSM exhibited the highest antioxidant capacity, measuring 41.488±0.684 mg/g of AAE. It was followed by the IPOLM with an antioxidant capacity of 37.133±5.604 mg/g of AAE, and IPORM with an antioxidant capacity of 32.333±1.866 mg/g of AAE. On the other hand, IPOREA displayed the lowest antioxidant capacity of 17.4±6.07 mg/g of AAE. These results suggest that the stem part of *I. quamoclit* possesses higher antioxidant property compared to other parts of the plant.

3.4 Ferrous reducing power assay (FRAP)

The FRAP was conducted to evaluate the RPC of the methanol and EAEs of *I. quamoclit* leaves, stem, and root, in comparison to the standard ascorbic acid. The reducing power assay assesses the ability of a compound to reduce ferric ions (Fe^{+3}) to ferrous ions (Fe^{+2}), indicating its potential as an antioxidant.

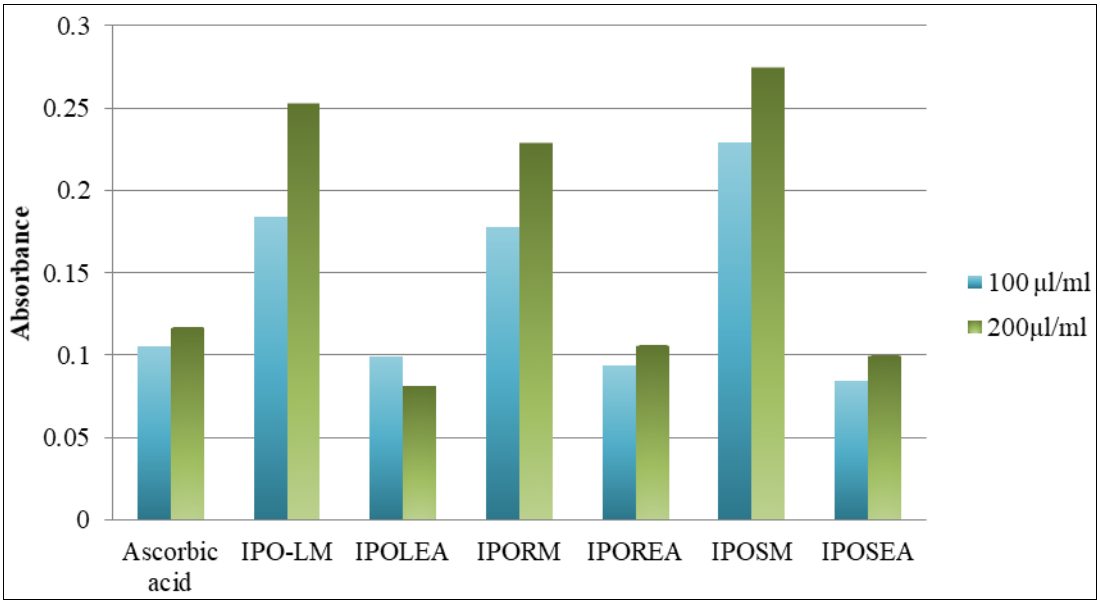

Fig 1: Ferrous RPC assay of different parts of *I. quamoclit*.

The results indicate that the ME of the leaves, stem, and root of *I. quamoclit* displayed notable reducing power capacity. Among the different plant parts, IPOSM exhibited the highest RPC at a concentration of 200 µl/ml, followed by IPOLM and IPORM, in comparison to the standard ascorbic acid. Similarly, at a concentration of 100 µl/ml, IPOSM showed the highest reducing power capacity, followed by IPOLM and IPORM, compared to the standard ascorbic acid. On the other

hand, IPOLEA exhibited the lowest reducing power capacity. The findings suggest that the ME of *I. quamoclit*, particularly from the stem and root, possesses significant reducing power, indicating its potential antioxidant activity. The higher RPC observed in IPOSM suggests that the stem extract may contain higher concentrations of reducing agents compared to the other parts.

3.5 DPPH Radical Scavenging Activity

The DPPH radical scavenging activity of the methanol and EAEs of *I. quamoclit*'s leaves, stems, and roots were evaluated in comparison to the standard antioxidant compound, BHT. This assay measures the ability of the extracts to scavenge the stable DPPH radical, which possesses an unpaired electron. The DPPH radical has an absorbance at 517 nm, and its color is reduced or decolorized upon neutralization by an antioxidant. By assessing the DPPH radical scavenging activity, the antioxidant potential of the plant extracts can be determined. The extracts' ability to neutralize the DPPH radical is compared to that of BHT, a well-known antioxidant standard. A higher scavenging activity suggests a stronger antioxidant capacity of the tested extracts.

Table 5: DPPH radical scavenging assay of different parts of *I. quamoclit*

Plant Samples	BHT	IPOLM	IPOLEA	IPORM	IPOREA	IPOSM	IPOSEA
DPPH Radical Scavenging Activity 100µl/ml)	77.48	47.780	31.180	31.600	34.890	64.050	33.350

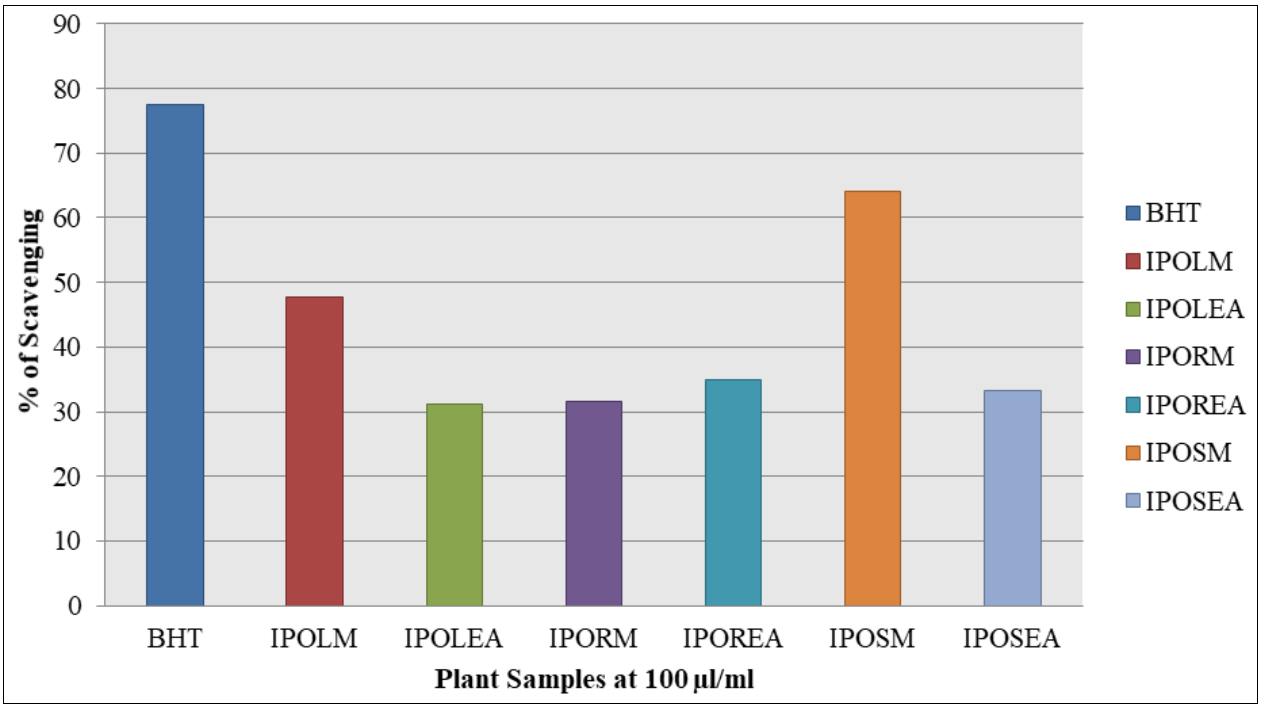

Fig 2: DPPH radical scavenging assay of different parts of *I. quamoclit*.

The result indicates that at a concentration of 100 µl/ml, the standard antioxidant BHT exhibited a radical scavenging activity of 77.48%. In comparison, IPOSM showed a radical scavenging activity of 64.05%, followed by IPOLM with a scavenging activity of 47.78%. However, IPOLEA exhibited the lowest radical scavenging activity of 31.18%. These findings suggest that IPOSM and IPOLM possess significant antioxidant properties, while IPOLEA has a relatively lower scavenging activity.

4. Discussion

Indeed, plants and plant-derived products are abundant sources of various phytochemicals. Plants produce an incredible diversity of phytochemicals, with estimates suggesting that there may be hundreds of thousands of different compounds. Each plant species has a unique phytochemical profile, and even different parts of the same plant can contain distinct phytochemical compositions. For example, the leaves, stems, roots, fruits, and seeds of a plant may contain different phytochemicals with varying concentrations. These phytochemicals can be classified into different groups based on their chemical structures and properties, such as alkaloids, flavonoids, terpenoids, phenolic compounds, and glucosinolates, among others. These compounds are known for their antioxidant activities [19]. In recent years, the scientist has a growing interest in natural antioxidants derived from plants due to the potential toxic effects associated with synthetic antioxidants [20]. Therefore, isolation and identification of phenols and flavonoids from plants are gaining popularity as natural antioxidants [21].

TAC is a measurement that quantifies the ability of a test solution to scavenge free radicals. It is commonly used to assess the antioxidant capacity of biological samples [22-25]. By evaluating the TAC, researchers can estimate the ability of plant extracts or compounds to neutralize and counteract the harmful effects of free radicals in the body. This information helps in understanding the potential health benefits of these natural antioxidants and their application in various fields.

In our study on *I. quamoclit*, we successfully screened the plant extracts for their phytochemical and antioxidant potential. The extracts exhibited strong antioxidant activity against various oxidative systems *in vitro*. Notably, the tested extracts demonstrated high RPC and radical scavenging activity, indicating their ability to counteract oxidative stress. Regarding the phytochemical composition, we found that IPOLM extract had a phenolic content of 6.097±0.189 mg/g

of GAE, while IPORM exhibited a slightly lower phenolic content of 4.515±0.1884 mg/g of GAE. IPOLEA, on the other hand, displayed the highest flavonoid content among the tested extracts, with a value of 12.815±0.234 mg/g of CAE. These phenolic compounds and flavonoids are known for their antioxidant properties and contribute to the overall antioxidant capacity of the extracts.

Furthermore, we evaluated the antioxidant capacity of the extracts using different methods. The IPOLM extract showed the highest absorbance of 0.335±5.604 SD in the phosphomolybdenum method, indicating its strong antioxidant capacity. In the reducing power method, IPOSM exhibited the highest absorbance of 0.275±0.001 µl/ml of AAE, suggesting its potent reducing power capacity. In terms of radical scavenging activity, IPOSM displayed the highest percentage inhibition at 64.050%, followed by IPOLM at 47.78%. These findings highlight the antioxidant potential of *I. quamoclit* extracts and suggest the presence of bioactive compounds, such as phenols and flavonoids, that contribute to their antioxidant activity. The results of our study support the exploration of *I. quamoclit* as a potential source of natural antioxidants with potential applications in various fields.

In the study by Renuka & Ravishankar (2014), the ethanol extract of *I. quamoclit* exhibited antioxidant activity, as evidenced by the absorbance values of 0.53±0.001 µg/ml of GAE at 200 µg/ml concentration and an absorbance of 0.34±0.008 in the phosphomolybdenum method. The IC_{50} value of 68.4 µg/ml obtained from the DPPH method indicates the effectiveness of the plant extract in scavenging DPPH radicals [26]. Another study on the ME of a whole *I. quamoclit* plant powder revealed the presence of various phytoconstituents, including saponins, phenolic compounds, alkaloids, carbohydrates, tannins, phytosterols, flavonoids, and amino acids [27].

In a different study, the TPC was reported as 39.32 mg/g of gallic acid equivalent, while the TFC was found to be 49.26 mg/ml of quercetin equivalent. Additionally, the radical scavenging activity was determined as 49.63 µg/ml [28]. The studies conducted by Clarke and Uddin also confirmed the antioxidant activity of *I. quamoclit* extracts. Clarke evaluated the ethanol and EAEs using the FRAP assay, indicating significant antioxidant activity [29]. Uddin evaluated the hydro-methanol extract of the aerial parts of *I. quamoclit* and reported substantial antioxidant activity using the DPPH scavenging assay [30]. Overall, these studies provide further evidence of the antioxidant potential of *I. quamoclit* and the presence of various phytochemicals that contribute to its antioxidant activity.

5. Conclusion

Indeed, the emergence of new chronic and infectious diseases has become a pressing concern for global population health in recent years. The rise of diseases such as Ebola, Zika, and the ongoing COVID-19 pandemic has highlighted the need for effective strategies to combat these threats. Consequently, scientists and researchers worldwide are intensifying their efforts to identify new substances that can help address these global health challenges. The importance of medicinal plants as a valuable resource for drug discovery cannot be overstated. They offer a vast array of chemical compounds with diverse biological activities, making them excellent candidates for the development of new drugs. In our study, the discovery of substantial antioxidant activity in *I. quamoclit*, along with its potential phytochemicals, opens up avenues for further research and exploration. The identified antioxidant activity suggests that *I. quamoclit* may have potential benefits in addressing chronic and infectious diseases. However, it's important to conduct additional investigations to assess its efficacy in other areas such as antidiabetic, cytotoxic, antifungal, antibacterial, anti-inflammatory, and analgesic activities. This comprehensive understanding of the plant's therapeutic potential will provide valuable insights into its possible applications in various disease treatments. Our future plans to isolate and identify the specific bioactive molecules (BMs) from different extracts of *I. quamoclit* are crucial steps in the research process. Structural elucidation and characterization of these compounds will contribute to our understanding of the plant's chemical composition and aid in the development of potential therapeutic agents. By identifying and studying these bioactive molecules, we can unlock the full potential of *I. quamoclit* for combating diseases and improving global health.

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