Evaluation of antioxidant activity and phytochemical profiling of *Ficus sur* (Moraceae) leaf extracts

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Abstract

The present study focused on the phytochemical composition and antioxidant potential of the leaves of *Ficus sur*, a medicinal plant used in Nigeria for the treatment of anemia and skin disorders. The objective of this work was to determine the chemical composition and antioxidant activity of the chloroform, ethyl acetate and ethanolic extracts of this plant. Three different methods were used to evaluate the antioxidant activity of the chloroform, ethyl acetate and ethanol leaf extracts: the FRAP assay (ferric reducing antioxidant potential), the DPPH radical scavenging assay (2,2-diphenyl-1-picryl hydrazyl) and the LPO assay (inhibition of lipid peroxidation). Qualitative phytochemical screening was also performed. The results showed that the *Ficus sur* ethanol extract exhibited the highest antioxidant activity compared to the ethyl acetate and chloroform extracts. The IC_{50} values for the chloroform, ethyl acetate and ethanol extracts were as follows: FRAP assay – 84.39, 39.41 and 33.25 µg/mL; DPPH assay – 117.97, 58.93 and 44.56 µg/mL; and LPO assay – 122.51, 68.76 and 49.36 µg/mL, respectively. The findings clearly suggest that the ethanol extract has higher antioxidant activity, likely due to its richer phytochemical profile. The results suggest that *Ficus sur* could be exploited in the management of oxidative stress-related diseases and infections, though direct antimicrobial studies are needed.

Introduction

The wide variety of plants found in nature possesses medicinal properties that can be used to cure various human ailments. Since antiquity, people have used medicinal plants to treat illnesses because they are considered less toxic and more economical [1]. This enduring practice has generated significant interest in herbal medicines, mostly linked to the presence of phytoconstituents [2]. The World Health Organization (2014) reports that 80% of the population worldwide relies on herbal plants for primary medical needs.

Research into the therapeutic potential of naturally occurring plant-based antioxidants, whether as isolates or raw extracts for use in functional foods, has gained attention in recent years. Understanding their efficacy in managing health, especially in treating ailments like cancer, diabetes, and inflammatory processes, has been of major significance [3] [4]. The bioactive compounds in extracts may exhibit a synergistic energy, which is thought to be beneficial in the treatment of complex and long-lasting diseases involving multiple pathways [5] [6].

Oxidative stress functions as both a signaling agent and a destructive force; because it controls transcriptional regulation and cell cycle regulation, its underlying mechanism remains complex [7] [8]. The antioxidant activity of natural products is thought to be strongly associated with phytochemicals like flavonoids and phenolic compounds [9] [10]. It is widely accepted that antioxidants play a significant part in shielding the body from varieties of diseases. They are a crucial component of the body's defense system and modulate oxidative processes and free radicals [11]. Foods that contain beneficial phytochemicals may augment the human body's antioxidant systems. However, phytochemical composition varies with geographical region, season and leaf maturity [12] [13].

Ficus sur is a notable medicinal plant and part of the Moraceae family. The plant is believed to contain numerous phytoconstituents that may lower blood glucose, oxidative stress and inflammation including alkaloids, flavonoids and phenolic compounds [14]. The *Ficus sur* is known by its local names *Akankoro* (Igbo), *Dullu* (Hausa), *Opoto* (Yoruba), and bush fig (English) [15]. The leaves of *Ficus sur* have been used in Nigeria to treat various illnesses, such as anemia, diabetes, cardiovascular disease, gastrointestinal disorders, diarrhea and scabies [16] [17] [18]. Previous studies have reported saponins, alkaloids, terpenoids, tannins, steroids, coumarins, flavonoids and phenolic compounds in the leaves [19].

Despite its ethnomedicinal importance, *Ficus sur* remains underutilized in drug development. To provide a rational foundation for the plant's use in alternative or conventional medicine, this study compared the phytochemical screening and antioxidant characteristics of different solvent extracts of *Ficus sur* leaves. To our knowledge, no previous study has concurrently compared chloroform, ethyl acetate and ethanol leaf extracts of *Ficus sur* using complementary antioxidant assays (DPPH, FRAP and LPO).

Materials and Methods

Sample collection and authentication

The fresh leaves of *Ficus sur* Forssk were harvested from Ohaukwu (N6°23'53.73" and E8°20'51.49") in the eastern region of Nigeria, following the guidelines suggested by Wondafrash [20]. The plant was authenticated by a taxonomist, Prof. Catherine V. Nnamani of Ebonyi State University, and a voucher specimen was deposited at the Herbarium of the Biology Department, Alex Ekwueme Federal University, Ndufu Alike, Ebonyi State (voucher number ObOs/2024/L042). The *Ficus sur* leaf sample was washed with deionized water, air-dried at room temperature, ground into a powder and kept at room temperature until use.

Extraction of plant samples

The protocol suggested by Spigno et al [21] as modified by Kapadia [22] was applied. The powdered plant sample was extracted with chloroform, ethyl acetate and 95% ethanol solvent in a Soxhlet equipment. Five hundred grams (500 g) of powdered *Ficus sur* leaves were placed in a thimble equipped with a round-bottom flask containing the desired solvent. The solvent was heated at its boiling temperature for 4 h and the powdered plant sample was extracted with chloroform, ethyl acetate and 95% ethanol. The extracted solution was reduced under pressure using a rotary evaporator and the crude extracts were refrigerated at 4°C until use.

Preliminary qualitative phytochemical analysis

Standard phytochemical screening techniques were used to test for alkaloids, flavonoids, tannins, steroids, glycosides, anthraquinones and phenlic comopounds according to Mohapatra *et al.* [23] with

minor modification.

Test for alkaloids

Each of the *Ficus sur* extracts was treated separately in dilute HCl before being filtered. Wagner's reagent (2 g of KI and 1.27 g of iodine in 100 mL of distilled water) was added to the filtrate. Alkaloids are present when a brown (reddish brown) precipitate forms [24].

Test for flavonoids

Three drops of a 10% (w/v) NaOH solution and a few drops of concentrated H_2SO_4 were added to 0.5 g of the *Ficus sur* extract. The development of a yellow colour suggests the presence of a flavonoid [25].

Test for phenols

Three drops of a 5% (w/v) $FeCl_3$ solution were added to 0.5 g of the *Ficus sur* extract. A bluish-black (blue or green) colour indicates the presence of phenols [26].

Test for saponins

After diluting 0.5 g of the *Ficus sur* extract with 20 mL of distilled water, the mixture was vigorously shaken in a test tube for 15 min. Foam that persists for 2 minutes indicates the presence of saponins [27].

Test for glycosides

A drop of $FeCl_3$ solution and 2 mL of glacial acetic acid were added after 0.5 g of powdered *Ficus sur* extract was diluted with 5 mL of water. Then 1 mL of concentrated H_2SO_4 was slowly added. A brown ring at the interface indicates glycosides [28].

Test for tannins

10 mL of distilled water and 0.5 g of *Ficus sur* extract were combined and heated for 5 minutes. Then, 2 drops of 5% $FeCl_3$ solution were added. A greenish precipitate indicates the presence of tannins [19].

Test for steroids

10 mL of chloroform was used to dissolve 0.5 g of the *Ficus sur* extract. A few drop of H_2SO_4 was added carefully to create a lower layer. A reddish brown colour indicates the presence of a steroidal ring [19].

Test for terpenoids

In a test tube containing 0.5 g of *Ficus sur* extract, 2 mL of chloroform was added. After adding a drop of concentrated H_2SO_4, the existence of terpenoids was confirmed by the reddish brown colour [27].

Determination of the in-vitro antioxidant scavenging assays

The DPPH, FRAP and LPO assays were used to assess the antioxidant activity of each solvent extraction of *Ficus sur*. By graphing the percentage of inhibition against concentration, the IC_{50} values were calculated.

Determination of antioxidant activity of Ficus sur leaves by DPPH assay

The DPPH (2, 2-diphenyl-1-picryl hydrazyl) assay was used to test the free radical scavenging activity of *Ficus sur* leaf extracts [29]. A 0.1 mM solution was made by dissolving 0.004 g of DPPH in 100 mL of analytical grade methanol and stored at 4°C. After dissolving 4 mg of crude extract in 10 mL of methanol to produce 400 µg/mL stock solution, the required working solutions (12.5, 25, 50, 100 and 200 µg/mL) were made by serial dilution with methanol. 2 mL of crude extract solution from each concentration was added to separate test tubes, followed by 3 mL of DPPH solution. A UV-Vis spectrophotometer was used to measure the absorbance at 517 nm following a 30 minutes dark incubation period. The ascorbic acid served as the reference standard and all measurements were performed in triplicate.

DPPH % Inhibition = $\frac{\text{Ablank}-\text{Asample}}{\text{Ablank}} X100$

where, A_{blank} is the mixture of DPPH solution without extract, and A_{sample} is the absorbance of the sample extract and DPPH solution.

Determination of antioxidant activity of Ficus sur leaves using ferric reducing antioxidant power

The FRAP assay was performed according to Benzie and Strain [30] with modifications by Sekhon-Loodu *et al* [31]. The reaction reagent was made by mixing 300 mM acetate buffer (pH 3.6), 10 mM TPTZ (2,4,6-tripyridyl-s-triazine) solution in 40 mM HCl, and 20 mM $FeCl_2$ in a 10:1:1 ratio. The TPTZ solution was freshly prepared on the day of analysis. Ethanol was used to create the ascorbic acid standard solution (1mM). A 96 well microplate (COSTRA, 9017) was used to collect samples (20 µL). For 15 min, the microplate was incubated at 37°C. then, 180 µL of working reagent was added to each well via the plate reader's pump. A FLUstar OPTIMA plate reader was used to measure the absorbance at 593 nm. Results were expressed as percentage of reducing activity relative to ascorbic acid.

Determination of antioxidant activity of Ficus sur leaves by Inhibition of lipid peroxidation assay

The inhibitory effects of the extracts on lipid peroxidation were assessed using a slightly modified thiobarbituric acid reactive substances (TBARS) assay, following Halliwell *et al* [32]. Briefly, 0.5 mL of 10% egg homogenate was added to 0.1 mL of extract or ascorbic acid at various concentrations (12.5, 25, 50, 100 and 200 *μ*g/mL) and made up to 1 mL with distilled water. Afterward, 0.05 ml of $FeSO_4$ was added to the mixtures and incubated for 30 minutes. Then, 1.5 mL of acetic acid and thiobarbituric acid in sodium dodecyl sulphate were added, sequentially. The resulting reaction mixture was vortexed and incubated at 95°C for 1 hour. The reaction mixtures were cooled, and 5 mL of butanol was added to each. After centrifuged at 1200 X g for 10 minutes, and the absorbance of the upper organic layer was read at 532 nm. The percentage inhibition of lipid peroxidation was calculated using the formula below:

% Inhibition = $\frac{Ablank - Asample}{Ablank} X100$

where, A_{blank} is the absorbance of the blank without extract, and A_{sample} is the absorbance with the sample or standard.

Statistical analysis:

The IC_{50} values were determined using non-linear regression and the experimental data were shown as mean ± standard deviation (SD) of three replicates. One-way analysis of variance (ANOVA) was performed on the data. All data analyses and visualization were created using GraphPad Prism 9.0 for Windows (GraphPad Software, San Diego, CA, USA) and Microsoft Excel 2016.

Results

The crude extracts were obtained from 500 g of *Ficus sur* leaves using solvents chloroform, ethyl acetate, and ethanol. The ethanol extract contained the majority of the bioactive components by mass chloroform, ethyl acetate and ethanol.

Qualitative Phytochemical Analysis from Different Solvent Extracts of Ficus sur leaf

The preliminary qualitative phytochemical analysis was performed in ethanol, ethyl acetate, and chloroform extracts. Although solvent polarity and the progressive extraction method played a significant role, the phytochemicals detected were more or less comparable across extracts. Secondary metabolites were detected in all the extracts, as summarized in Table 1. Within the chloroform extract, terpenoids, saponins and tannins were present. In ethyl acetate extracts, the terpenoids, alkaloids, flavonoids, tannins and phenols were present, but the saponins and glycosides were absent. Although the ethanol extracts showed the presence of terpenoids, alkaloids, flavonoids, tannins, glycosides and phenolic compounds, and saponin, was absent.

Table I Phytochemical screening of three solvent extracts of *Ficus sur* leaf

Phytochemicals	Chloroform	Ethyl acetate	Ethanol
Terpenoids	+	+	+
Alkaloids	-	+	+
Flavonoids	-	+	+
Saponins	+	-	-
Tannins	+	+	+
Glycosides	-	-	+
Phenolic compounds	-	+	+
Steroids	-	-	+

+ = Present, - = Absent.

Effect of Ficus sur leaf extracts on the DPPH assay (In vitro):

The antioxidant activity of the three solvent extracts and standard ascorbic acid against the DPPH radical was evaluated using doses ranging from 12.5 to 200 µg/mL. Table 2 and Fig. 1 depict the ethanol, ethyl acetate and chloroform extracts showing concentration-dependent free radical scavenging activity, ranging from 28.22–70.86%, 13.12–63.93% and 3.25–52.89%, respectively, compared to the standard ascorbic acid (36.22–84.02%). The ethanol extract had the greatest inhibitory effect (70.86%), followed by ethyl acetate (63.93%) with chloroform showing the least (52.89%) at 200 µg/mL.

Table 2
In vitro DPPH scavenging activities of *Ficus sur* leaf extracts

Concentration (*µ*g/mL)	DPPH scavenging activity (% inhibition)			
	Chloroform	Ethyl acetate	Ethanol	Ascorbic acid
12.5	3.25 ± 0.48	13.12 ± 0.65	28.22 ± 0.47	36.22 ± 0.55
25	16.20 ± 0.92	31.44 ± 0.58	40.76 ± 0.22	52.46 ± 0.28
50	28.58 ± 0.33	43.73 ± 0.45	51.18 ± 0.69	63.44 ± 0.53
100	47.31 ± 0.31	59.99 ± 0.51	65.56 ± 0.41	78.56 ± 0.31
200	52.89 ± 0.32	63.93 ± 0.36	70.86 ± 0.16	84.02 ± 0.85
Values are mean ± standard deviation (n = 3)				

The IC_{50} values (concentration required for 50% inhibition) were 44.56 µg/mL (ethanol), 58.93 µg/mL (ethyl acetate), and 117.97 µg/mL (chloroform) Fig. 2. The IC_{50} for standard ascorbic acid was 25.92 µg/mL. A lower IC_{50} value indicates higher antioxidant activity. Phenolics and flavonoids are considered

strong free radical scavenging compounds, but the chloroform extract had the highest IC_{50} (lowest activity), ethyl acetate showed moderate activity and ethanol exhibited the maximum activity (lowest IC_{50}).

Effect of Ficus sur leaf extracts on the FRAP assay (In vitro)

The FRAP assay, which relies on the reduction of ferric tripyridytriazine (Fe(III)-TPTZ) complex to the ferrous tripyridtriazine (Fe(II)TPTZ) at low pH [31], was also used to determine the antioxidant capacity of several extracts from *Ficus sur* leaves. The reducing power of *Ficus sur* leaf extract using different solvents (chloroform, ethyl acetate and ethanol) is illustrated in Table 3. The ethanol extract showed the highest reducing ability (37.78–82.97%), followed by the ethyl acetate (17.03–70.78%) and the least reducing ability is the chloroform extract, which showed (8.75–53.93%). Whereas the standard ascorbic acid ranged from 42.25–88.86%. The percentage of reducing activity increases when the concentration of the extracts increases, particularly if the extract's contents have flavonoids and polyphenolic compounds. Our findings suggest that the ethanol extract from *Ficus sur* leaves had excellent antioxidant capabilities compared to the standard ascorbic acid used.

Table 3
In vitro FRAP reducing activities of *F. sur* leaf extracts

Concentration (*µ*g/mL)	**FRAP reducing assay (% activity)**			
	Chloroform	**Ethyl acetate**	**Ethanol**	**Ascorbic acid**
12.5	8.75 ± 0.91	17.03 ± 0.21	37.78 ± 0.23	42.25 ± 0.15
25	25.78 ± 0.69	38.97 ± 0.23	48.95 ± 0.16	57.77 ± 0.09
50	39.50 ± 0.33	54.71 ± 0.23	56.35 ± 0.08	69.36 ± 0.05
100	52.19 ± 1.37	65.05 ± 0.03	77.81 ± 0.06	84.92 ± 0.03
200	53.93 ± 0.09	70.78 ± 0.07	82.97 ± 0.03	88.86 ± 0.01

The IC_{50} values for the FRAP assay for the chloroform, ethyl acetate and ethanol were 84.39 µg/mL, 39.41 µg/mL and 33.25 µg/mL, respectively. When compared to the standard ascorbic acid 19.35 µg/mL, as shown in Fig. 3. Plant reducing ability is determined by reducing agents, which give protons by splitting the free radical chain [33].

Effect of Ficus sur leaf extracts on the LPO assay (In vitro)

The ways in which antioxidants inhibit the oxidation of food and increase the antioxidant efficacy have attracted much attention. In the present study, the inhibitory effect of different solvents of *Ficus sur* leaf extracts on lipid oxidation was measured using the thiobarbituric acid reactive substances assay. Table 4 showed that the ethanol and ethyl acetate extracts of *Ficus sur* leaf exhibited moderate inhibition activities of 26.91–69.60% and 9.37–61.81%, respectively, compared with the standard ascorbic acid

31.81–81.99%. The chloroform extract showed lower inhibitory activity of -0.14–49.93%. Therefore, the percentage of inhibition increased with the increasing concentration.

Table 4
In vitro LPO inhibition activities of *F. sur* leaf extracts

Concentration (*µ*g/mL)	**LPO inhibition assay (% inhibition)**			
	Chloroform	**Ethyl acetate**	**Ethanol**	**Ascorbic acid**
12.5	-0.14 ± 0.31	9.37 ± 0.44	26.91 ± 0.87	31.81 ± 0.31
25	11.01 ± 0.46	27.14 ± 0.34	38.14 ± 0.15	50.10 ± 0.71
50	25.40 ± 0.31	39.95 ± 0.62	49.30 ± 0.37	61.34 ± 0.38
100	46.22 ± 0.29	57.46 ± 0.67	64.99 ± 0.36	76.87 ± 0.44
200	49.93 ± 0.43	61.81 ± 0.14	69.60 ± 0.13	81.99 ± 0.36

In the different extracts of *Ficus sur* leaf, the IC_{50} values of the chloroform, ethyl acetate and ethanol were 122.51 µg/mL, 68.76 µg/mL and 49.36 µg/mL, respectively, while the standard ascorbic acid value was 29.23 µg/mL as shown in Fig. 4. The ethanol extract has a moderate IC_{50} value, as the ethyl acetate and chloroform have high IC_{50} values when compared with the standard. However, the remaining antioxidant assay method in the ethanol extract exhibited the highest antioxidant activity and was more potent than the ethyl acetate and chloroform extracts.

The different extracts of *Ficus sur* leaves exhibited concentration-dependent free radical scavenging activity. The ethanol extract showed excellent scavenging and reducing abilities of 70.86% and 82.97% for DPPH and FRAP activities, respectively. The antioxidant activity of ethyl acetate extracts was 63.93%, 70.78% and 61.81% for DPPH, FRAP and LPO respectively. The least antioxidant activity is found in the chloroform extracts at 52.89 µg/mL, 53.93 µg/mL and 49.93 µg/mL in DPPH, FRAP and LPO, respectively, at a concentration of 200 µg/mL. The overall comparison of the antioxidant activity of the three leaf extracts of *Ficus sur* and the standard ascorbic acid in terms of IC_{50} values and scavenging activity at 200 µg/mL was given in Table 5.

Table 6
Free-radical scavenging activity at 200 µg/mL and their IC_{50} values in

Samples	Antioxidant assay					
	DPPH		FRAP		LPO	
	%I	IC_{50}	%A	IC_{50}	%I	IC_{50}
Chloroform	52.89 ± 0.32	117.97	53.93 ± 0.09	84.39	49.93 ± 0.43	122.51
Ethyl acetate	63.93 ± 0.36	58.93	70.78 ± 0.07	39.41	61.81 ± 0.14	68.76
Ethanol	70.86 ± 0.16	44.56	82.97 ± 0.03	33.25	69.60 ± 0.13	49.36
Ascorbic acid	84.02 ± 0.85	25.92	88.86 ± 0.01	19.35	81.99 ± 0.36	29.23

Discussion

The interest in natural therapies and plant-based products with less harmful side effects is increasing. The choice of solvent affects the extraction of different phytomolecules due to their varying polarities. Therefore, the selection of appropriate solvents and extraction techniques is crucial for enhancing the biological properties of phytoconstituents [34]. Medicinal plants are the main source of bioactive compounds having pharmacological properties, making them an important resource for both conventional and contemporary medicine [35] [36]. Their relevance comes from their excellent effectiveness and affordability. The seasons and life stages of medicinal plants affect the amount of volatile compounds they contain. These compounds serve important functions in repelling pests, inhibiting plant growth and attracting pollinators [37] [38].

The ethanol extract of *Ficus sur* leaves contained alkaloids, flavonoids, terpenoids, steroids, glycosides, tannins and phenolic compounds, but saponins were absent. Ethyl acetate extracts contained terpenoids, tannins, flavonoids and alkaloids, but the saponins, glycosides, or steroids were absent. And the chloroform extract contained saponins, tannins and terpenoids, but lacked the alkaloids, flavonoids, steroids, glycosides and phenolic compounds. The presence of flavonoids, tannins and phenolic compounds is particularly notable, as these are associated with a variety of pharmacological activities, including antibacterial, antiallergic, antidiabetic, anti-inflammatory and anticancer properties [39] [40].

Oxidative stress caused by free radicals influences degenerative diseases. Antioxidants control the body's oxidative and free radical activities and they are essential components of defensive mechanisms against a variety of diseases, including diabetes [41] [42]. Diabetes research has focused on natural products with antioxidant effects [43] because they have fewer adverse effects and are more readily available. The current study's DPPH, FRAP and LPO findings demonstrate antioxidant activity in chloroform, ethyl acetate and ethanol extracts. However, ethanol was more successful than chloroform in extracting antioxidant compounds [44] [45]. The IC_{50} values obtained for the ethanol extract (DPPH: 44.56 µg/mL) are comparable to or better than those reported for the other *Ficus* species. Like the *Ficus*

carica leaf extracts have shown DPPH IC_{50} values ranging from 224 µg/mL depending on the solvent and geographical origin [46]. The great activity of the ethanol extract is consistent with the higher polarity of the solvent, which efficiently extracts polyphenolic compounds known to donate hydrogen atoms to stabilize DPPH radicals. The FRAP assay measures reducing ability based on electron transfer, while the DPPH measures radical scavenging via hydrogen atom transfer. The ethanol extract performed well in both, suggesting it contains compounds capable of both electron donation and hydrogen atom transfer. The ethanol extract uniquely contained steroids and glycosides in addition to phenolics and flavonoids. While steroids are not typically strong direct antioxidants, certain glycosides may enhance solubility and bioavailability, indirectly contributing to the observed activity. Future studies should quantify total phenolic and flavonoid content to enable correlation analysis with IC_{50} values.

The present results support the ethnomedicinal use of *Ficus sur* leaves in managing oxidative stress-related conditions.

Conclusion

The present study revealed that the extracts from *Ficus sur* leaves possess excellent potential as a natural source of antioxidant properties under in vitro conditions. Bioactive molecules such as flavonoids, alkaloids, tannins and phenols were detected, and these compounds likely drive the antioxidant effects. The ethanol extract demonstrated the most powerful antioxidant properties across all assays, while the ethyl acetate extract showed moderate efficacy and the chloroform extract showed the least. These in vitro findings support the ethnomedicinal relevance of Ficus sur leaves and provide a theoretical framework to justify further studies.

Limitation and Future study of the plant

In the present study, we only carried out the preliminary screening and in vitro studies of different solvent extracts from *Ficus sur* leaves. Due to limited resources, we were unable to do an in vivo assay, molecular pathway analysis and quantitative structure-activity relationship (QSAR) modeling. Additionally, total phenolic and flavonoid content was not quantified, which would have allowed correlation analysis with IC_{50} values. In the future, isolation, characterization and molecular analysis should be carried out for validation of our study.

Declarations

Ethics approval and consent to participate

There were no human or animal participants in this study. The plant material (*Ficus sur* leaves) was collected in June, 2024 from Ohaukwu in Ebonyi State, Nigeria. The plant was collected from the private farmland of Mr Chika Ogàdali after obtaining written consent.

Consent for publication:

Not applicable. This manuscript contains no individual person's data, image or identifying information.

Declaration of competing interest:

The authors declare they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Author Contribution

Author OO conceived and designed the experiments; EDO and OFO performed the laboratory experiments; SS and NCA analysed the data; SS, CID and OO searched the literature. OO and SS supervised the experiments; all authors contributed to the writing of the manuscript and confirmed publication of the final version.

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Data Availability

All data generated or analysed during this study are included in this published article. Raw data are available from the corresponding author upon reasonable request.

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Figures

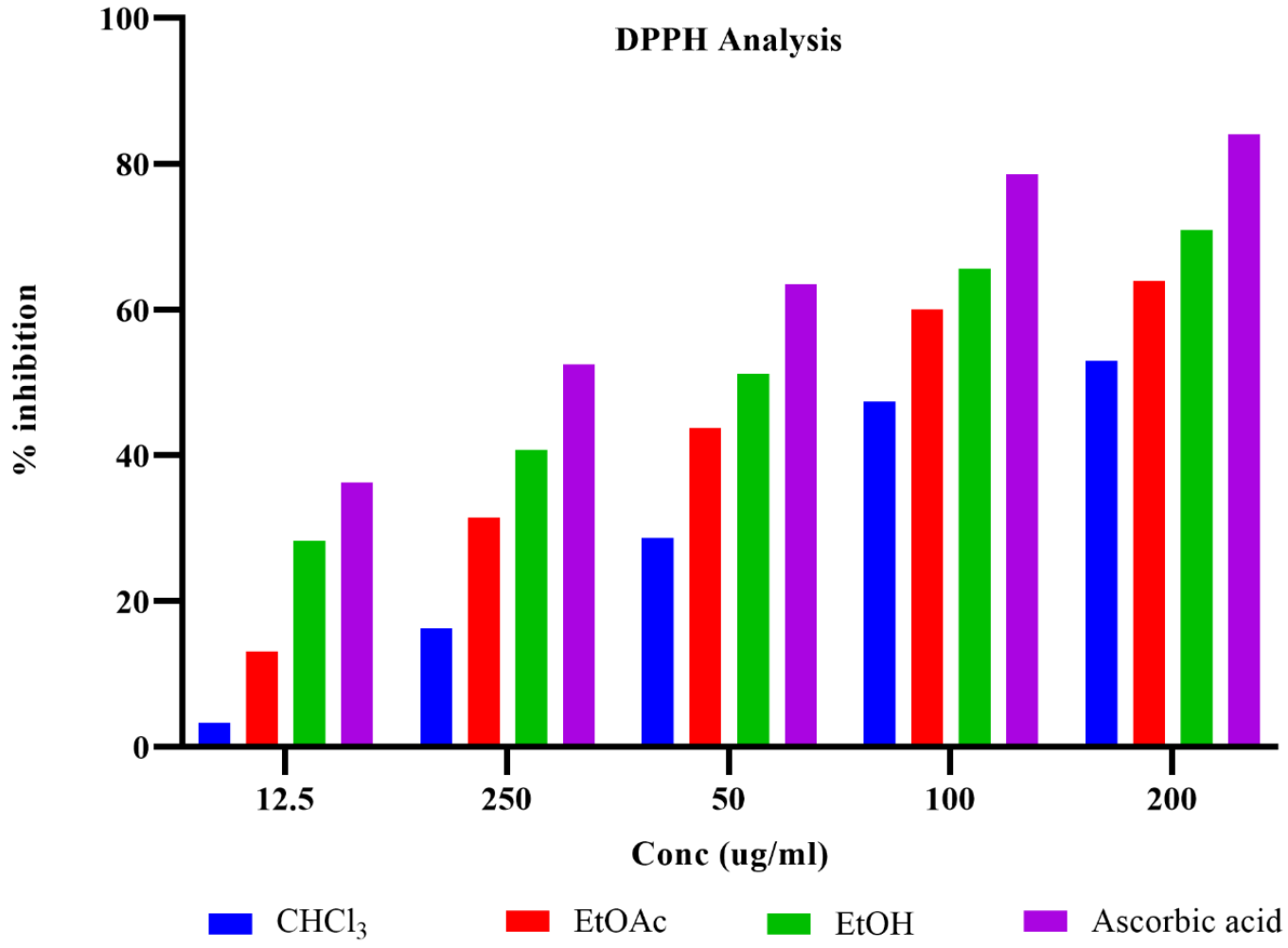

Figure 1

DPPH scavenging activity (% inhibition) of *Ficus sur* leaf extracts

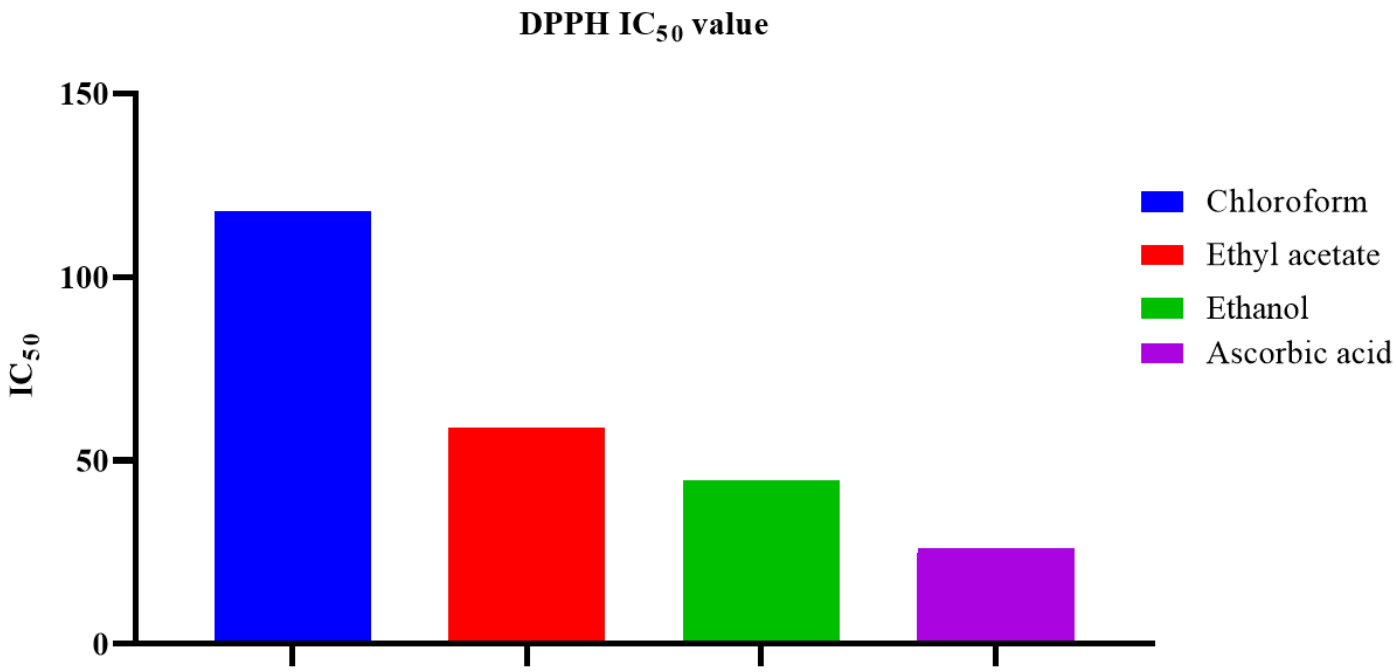

Figure 2

DPPH scavenging activity (IC_{50} value) of *Ficus sur* leaf extracts

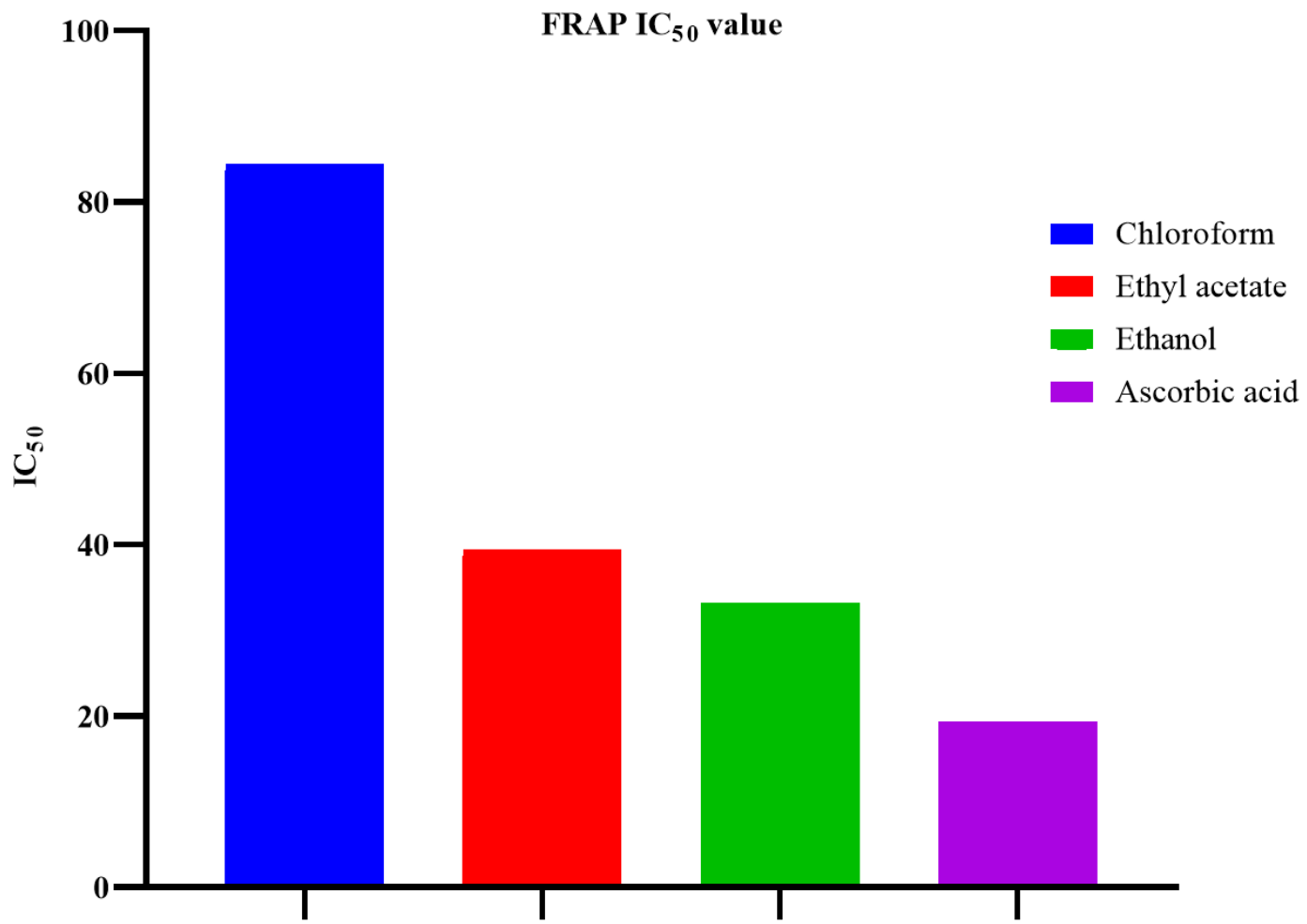

Figure 3

FRAP reducing activity (IC_{50} value) of *Ficus sur* leaf extracts

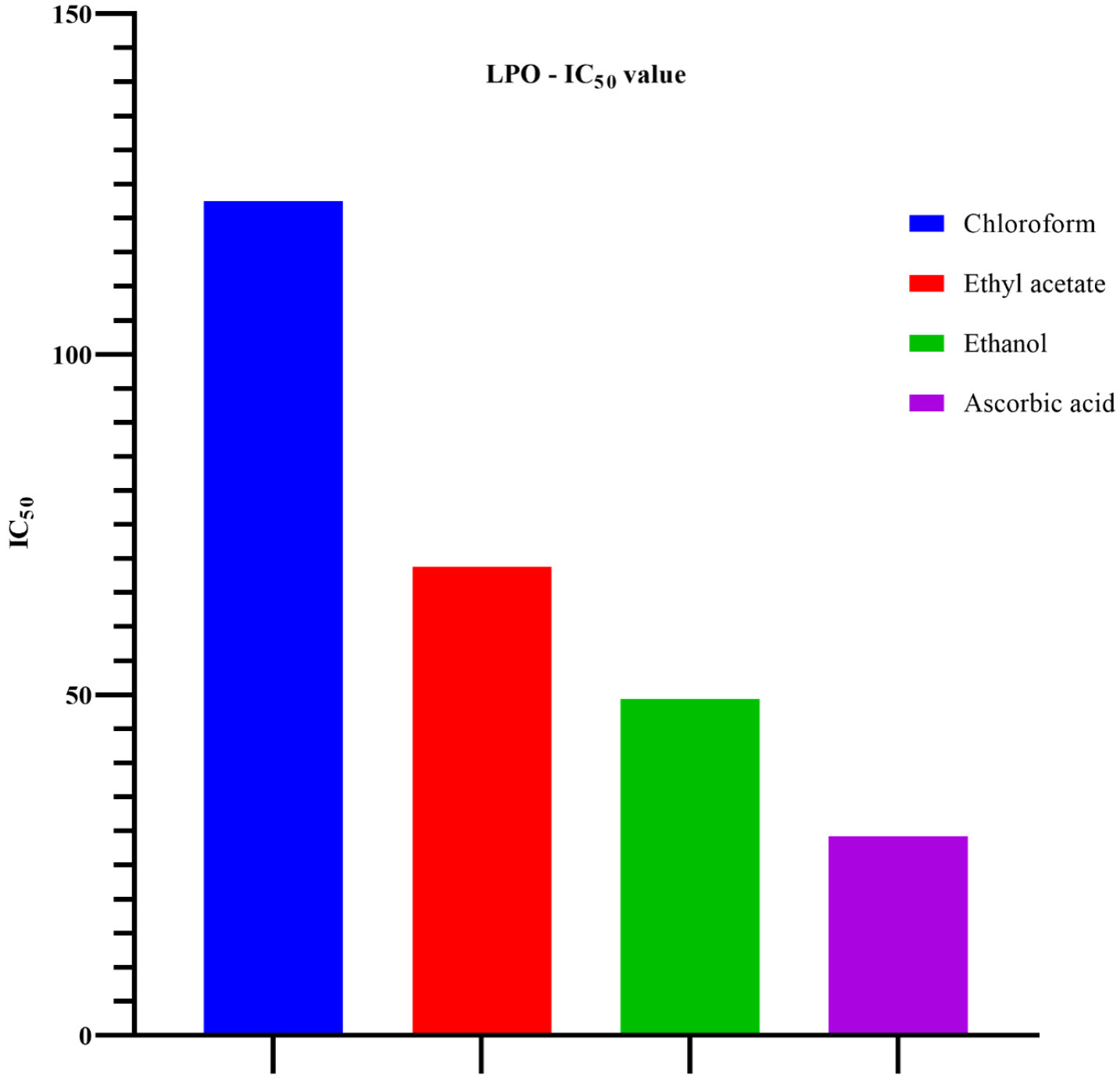

Figure 4

LPO inhibition activity (IC_{50} value) of *Ficus sur* leaf extracts