



Abstract

Phytochemicals from plants show promise in treating human diseases, supporting plant defense, and acting as natural antioxidants against free radicals.

This study investigated the phytochemical constituents and antioxidant properties of *Ficus sagittifolia* leaf and stem bark extracts. Utilising ethanol maceration, crude extracts were obtained, which were further partitioned into n-hexane, ethyl acetate, and aqueous ethanol fractions. Phytochemical analysis was conducted using standard methods to quantify total phenolics, flavonoids, tannins, saponins, and alkaloids. Spectrophotometric methods evaluated antioxidant activity through 2,2-diphenylpicryl hydrazyl radical (DPPH*) and the phosphomolybdate assays.

Phytochemical screening revealed the presence of flavonoids, saponins, terpenoids, tannins, phenolics, and alkaloids in the leaf and stem bark of *F. sagittifolia* extracts and fractions. The phenolic content of *F. sagittifolia* was most abundant in stem ethanol crude extract, with a 3.53 ± 0.03 mg/g equivalent of gallic acid. The stem bark aqueous ethanol fraction of *F. sagittifolia* had the highest total flavonoid and tannin content, with estimated quercetin and tannic acid contents of 3.41 ± 0.08 mg/g and 1.52 ± 0.05 mg/g, respectively. The hexane leaf fraction of *F. sagittifolia* had the utmost saponin and alkaloid contents, with 5.10 ± 0.48 mg/g equivalent of saponins and 0.171 ± 0.39 g of alkaloids. The leaf aqueous ethanol fraction of *F. sagittifolia* showed high antioxidant activity ($IC_{50} = 63.092$ μ g/mL) and the stem ethanol crude extract (227.43 ± 0.78 mg/g equivalent of ascorbic acid) for the DPPH* and phosphomolybdate methods, respectively, and the least active was found to be the stem hexane fraction using both methods, 313.32 μ g/mL and 16.21 ± 1.30 mg/g equivalent of ascorbic acid, respectively.

The aqueous ethanol fractions of leaf and stem bark of *F. sagittifolia* are rich sources of natural antioxidants and hold promise for applications in health and nutrition, which could potentially contribute to the prevention of oxidative stress-related diseases.

Keywords: Antioxidant activity; *Ficus sagittifolia*; Moraceae; Phytochemicals.

Introduction

Ficus Species

Uses: Various parts of *Ficus*—such as leaves, bark, roots, fruits, and latex—are commonly employed to treat ailments related to the digestive, endocrine, reproductive, and respiratory systems [1].

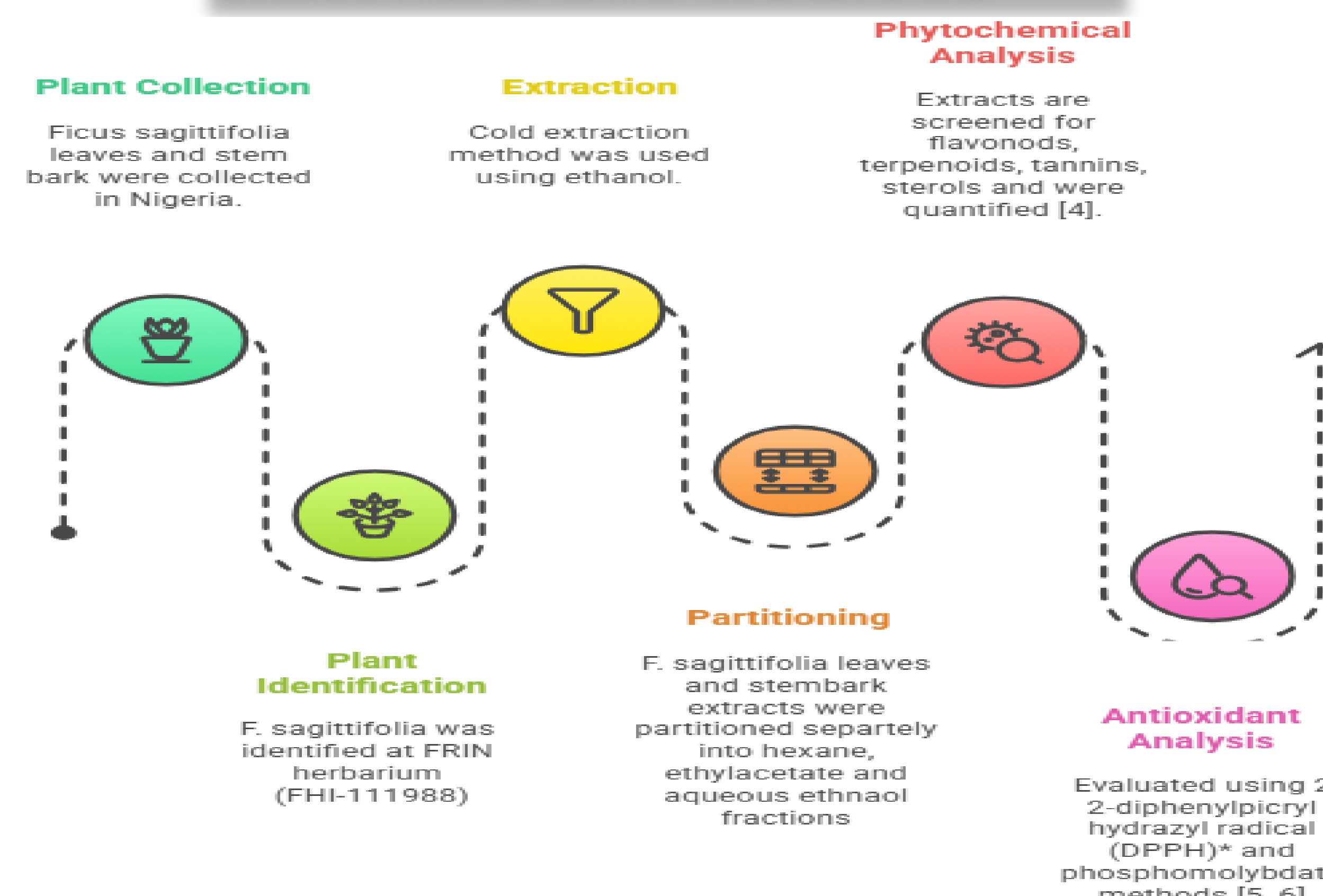
Phytochemicals: including tannins, flavonols, flavonoids, terpenoids, and glycosides. Additionally, they exhibit important pharmacological activities such as antimicrobial, anti-diabetic, anti-ulcer, antioxidant, and anticancer effects [2].

- an epiphytic shrub that can grow into a tree up to 10 meters tall
- found in the closed forests of Casamance, Senegal, Nigeria, and Cameroon
- The bark and leaves are traditionally used to address pulmonary and stomach disorders, respectively, and in Sierra Leone, the bark is consumed for colic relief [3].

Ficus sagittifolia (Moraceae)

Due to the increasing interest in natural antioxidants and the potential therapeutic benefits of medicinal plants, this study assessed the phytochemical content and evaluated the antioxidant activity of the leaf and stem bark of *F. sagittifolia* to provide scientific evidence for its medicinal applications.

Materials and Methods



Results and discussion

Preliminary phytochemical revealed the presence of phenolics, flavonoids steroids, tannins, saponins, alkaloids, and terpenoids. Among, the extracts and fractions, the ethanolic crude extract of *F. sagittifolia* stem bark had the highest Total Phenolic content. The aqueous ethanol fraction from the stem bark of *F. sagittifolia* had the highest flavonoid content. The tannin content was prevalent in the aqueous ethanol fraction from the stem bark of *F. sagittifolia* while the hexane leaf fraction of *F. sagittifolia* had the utmost saponins and alkaloids contents (Table 1)

Table 1: Quantified Phytochemicals in the Leaves and Stem Bark of *F. sagittifolia*

Compounds	Total phenolics (GAE/g)	Total flavonoids (QUE/g)	Total Saponins (SA/g)	Total Tannins (TA/g)	Total Alkaloids (g)
FSL HEX	0.32±0.02	0.80±0.18	5.10±0.48	0.99±0.32	0.171±0.78
FSS HEX	0.47±0.05	0.37±0.08	3.95±0.07	1.31±0.02	0.058±0.14
FSL EtOAc	2.14±0.03	1.48±0.07	2.73±0.11	1.33±0.05	0.158±3.18
FSS EtOAc	2.22±0.11	1.20±0.01	2.59±0.46	0.99±0.31	0.168±1.27
FSL Crude	2.21±0.02	0.88±0.02	3.43±0.45	1.34±0.01	0.101±3.18
FSS Crude	3.53±0.03	1.84±0.04	2.81±0.48	1.26±0.07	0.050±0.71
FSL Aq EtOH	2.14±0.11	1.70±0.04	3.13±0.03	1.43±0.04	0.073±0.57
FSS Aq EtOH	3.25±0.03	3.41±0.08	2.42±0.23	1.52±0.05	0.070±0.49

F. sagittifolia leaf (FSL) and stem bark (FSS), hexane (HEX), ethyl acetate (EtOAc) and aqueous ethanol fractions (Aq EtOH)

Results and discussion contd'

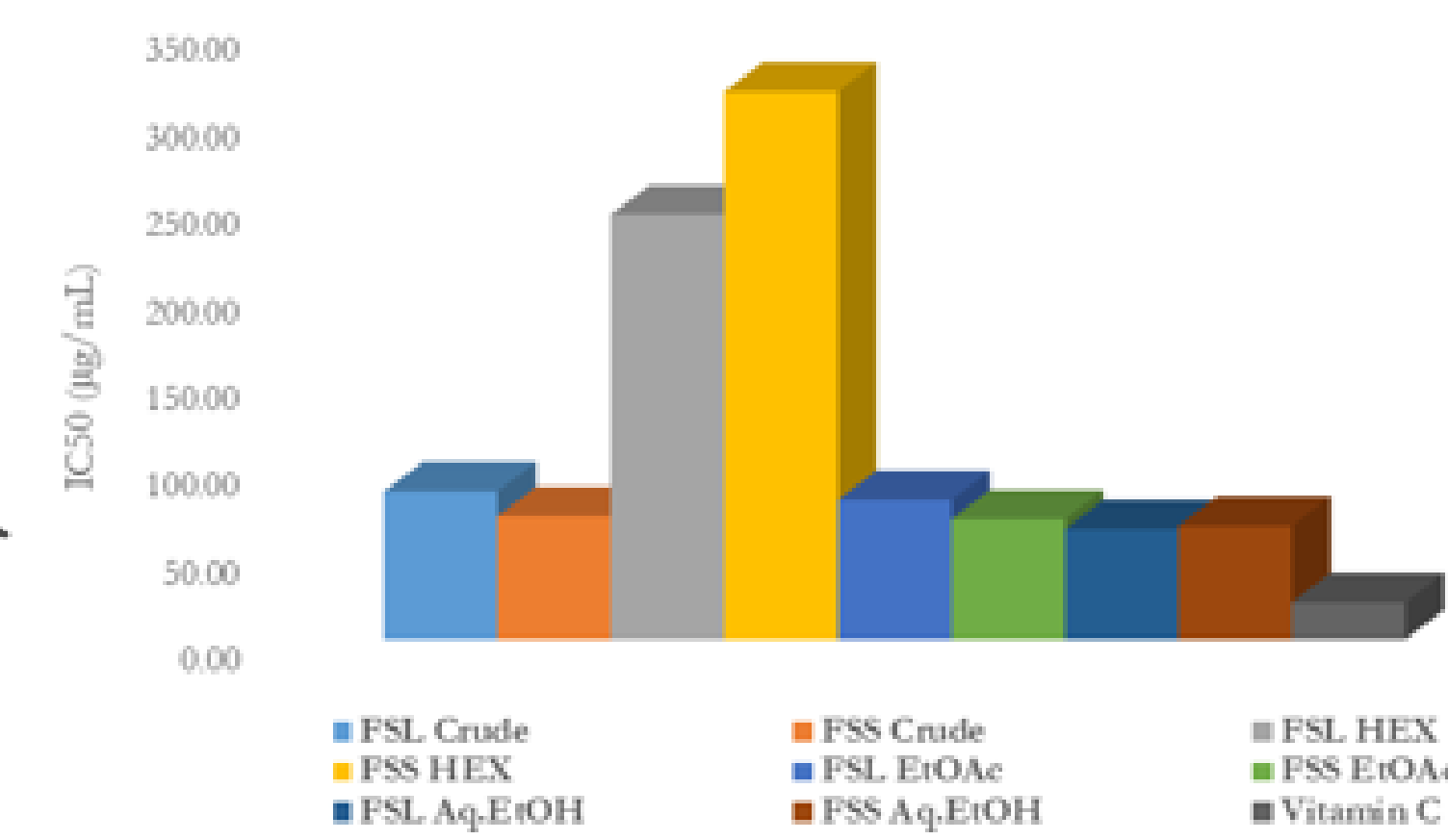


Figure 1: IC_{50} DPPH scavenging activity of *F. sagittifolia* extracts and fractions using DPPH* method

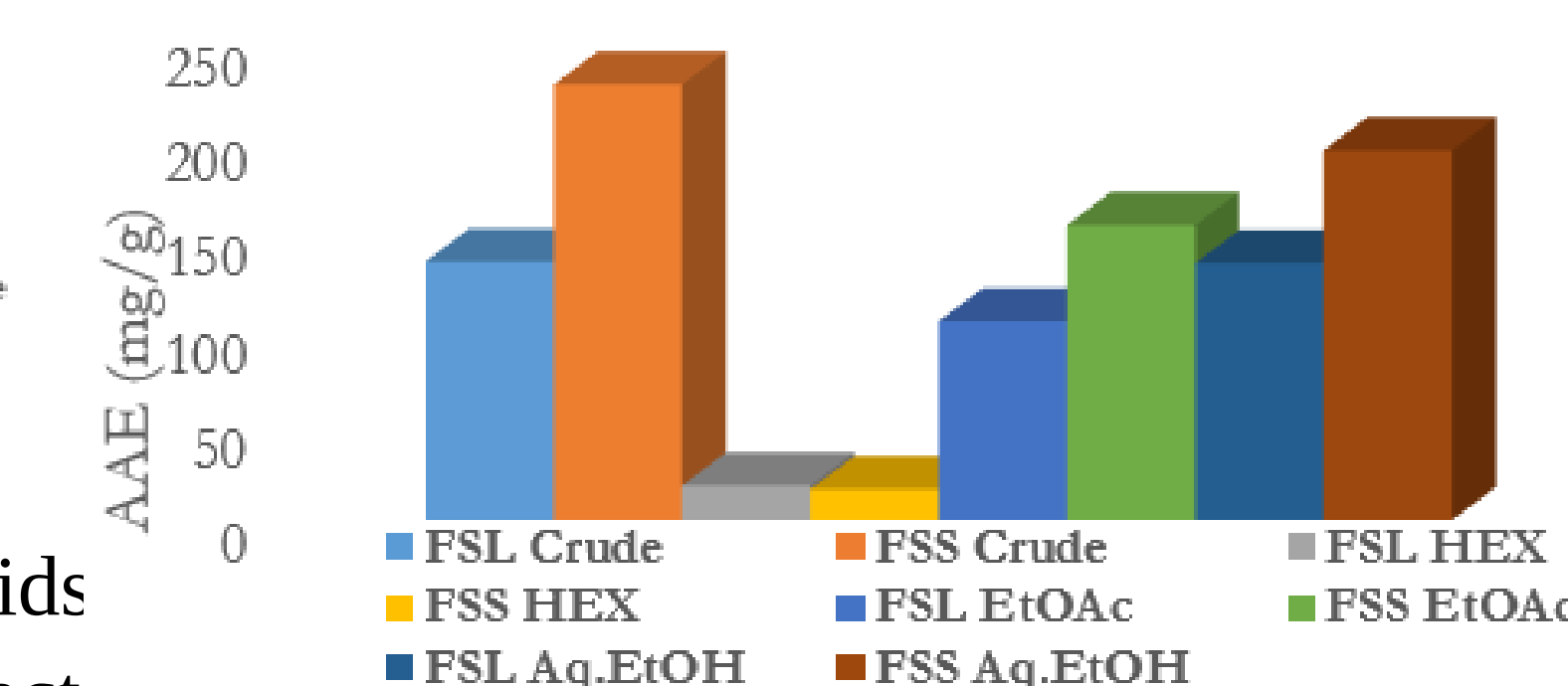


Figure 2: Total Antioxidant Capacity of *F. sagittifolia* extracts and fractions using phosphomolybdate method

Conclusion

The current study identified a variety of phytochemicals including terpenoids, flavonoids, phenols, alkaloids, saponins, and steroids in the leaf and stem bark of *F. sagittifolia*. The aqueous ethanol extract from both the leaf and stem bark exhibited strong antioxidant activity, as demonstrated through DPPH radical scavenging and the phosphomolybdate method. In contrast, the hexane fractions of these plant parts showed the lowest levels of activity. Therefore, the aqueous ethanol fractions from the leaf and stem bark of *F. sagittifolia* present a promising source of antioxidants worth further exploration.

The aqueous ethanol fraction of *F. sagittifolia* leaf (FSL Aq EtOH) had the lowest IC_{50} DPPH scavenging activity (63.092 μ g/mL) depicting to have the highest antioxidant activity and hexane fraction of *F. sagittifolia* stem (FSS Hex) was found to be the least in activity (313.32 μ g/mL) (Figure 1). The presence of phenolic compounds (containing phenolic hydroxyl) in these aqueous ethanol fractions could be attributed to the observed high antiradical properties of these fractions.

The phosphomolybdate assay determines the total antioxidant capacity (TAC) of plant extract/fraction usually expressed as ascorbic acid equivalents. Ethanol crude extract of *F. sagittifolia* stem exhibited the highest antioxidant capacity for phosphomolybdate reduction (227.424 ± 0.78) with the both hexane fractions showing low activity (Figure 2)

Acknowledgements

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