
PROXIMATE AND PHYTOCHEMICAL ANALYSIS OF FICUS SPECIES COMPOSITE LEAF POWDER

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ABSTRACT

The study was carried out to evaluate the proximate and phytochemical composition of three *Ficus* spp (*Ficus carica*, *F. exasperata* and *F. thonningii*). Fresh leaves were harvested, air-dried and milled. Samples of the composite mix was subjected to laboratory analysis to determine the proximate and phytochemical. Results obtained indicated that the composite leaf powder contained Moisture content, ash, Fat, Crude Fibre (CF), Crude Protein (CP) Crude fat, ash and Carbohydrate 9.99%, 10.59%, 4.58%, 21.03%, 10.83% and 42.94% respectively. The composite contains phenol, flavonoids, alkaloids tannins, phytates, anthraquinone, and cardiac glycosides. The most prevalent phytochemical was phenol. In **CONCLUSION**, the composite mix contains a significant number of nutrients and phytochemicals which could be employed as a natural feed supplement in animal nutrition. More research is needed to assess the efficacy of the composite leaf powder as a feed supplement on animal performance and health.

KEYWORDS: *Ficus*, Phytochemical, Composite, Proximate

INTRODUCTION

Ficus belongs to one of the largest angiosperms genera (“groups of plants”), which have more than 800 plant species, many of which are epiphytes or shrubs that grow in the tropical and subtropical regions of the world (Singh *et al.*, 2011). It is one of the world's oldest recognized fruit trees. There are around 750 species in the genus *Ficus*. (Imana, 2020). Preparation of the combination of different parts such as leaves, barks, latex and fruits has proved effective for the treatment of haemorrhoids, diabetes, stomachache, skin diseases, diarrhoea, dysentery and ulcers (Joseph and Raj, 2010). The preparation has been used as an anti-cancer agent, carminative, antioxidant, anti-inflammatory and astringent (Joseph and Raj, 2010). The therapeutic use of natural products from indigenous plants for ethno-medicinal and nutritional purposes has grown tremendous interest among scientists to search for bioactive components (Wangensteen *et al.*, 2004) that are beneficial to man and animals. Recently, the interest in natural products from plants and their use has increased tremendously even in areas where conventional medicines are very much available. Medicinal plants are sources of raw materials for pharmaceutical drug formulation (WHO, 2014). A significant percentage of medicinal plants used in Africa are affordable when compared to the high cost of conventional medicines. *Ficus* plants are a good source of a wide range of phytochemicals such as polyphenols, carotenoids, alkaloids, sulphur-containing groups, terpenes and terpenoids, which contain enormous anti-microbial and antioxidant properties (Bhanu *et al.*, 2020)

MATERIALS AND METHODS

Ficus carica, *Ficus exasperata*, and *Ficus thonningii* leaves were harvested at the Federal College of Agriculture, Akure. After identification in the Forestry Department, the leaves were air-dried, milled and stored in an air tight container.

Chemical Analysis of Composite *Ficus* species leaf powder

The milled composite leaves were analyzed for proximate composition following the methods of A.O.A.C (2005). Phytochemical composition such as phenol, flavonoids, alkaloids, tannins, phytates, anthraquinone and cardiac glycosides were analyzed. The proximate and phytochemical analysis were carried out at the main laboratory of the Federal University of Technology, Akure.

Result and DISCUSSION

Proximate Compositions of Composite Ficus species Leaf Powder

The proximate composition of the composite of three *Ficus* species as shown in Fig. 1. The composite leaf powder contained Moisture content, Ash, Fat, Crude Fibre (CF), Crude Protein (CP) and Carbohydrate 9.99%, 10.59%, 4.58%, 21.03%, 10.83% and 42.94% respectively. The amount of moisture could confer immense benefits on the leaf powder, also assuring a long shelf life storage, which prevents spoilage by micro organisms (Erkmen and Bozoglu 2016). The ash content is a measure of the mineral contents present in any given sample. In a study conducted by Osowe *et al.* (2021), *F. carica*, *F. thonningii* and *F. exasperata* had an ash range of 8.69 – 9.87%, having a close similarity with the present study. The crude protein content of the composite leaf meal (10.83) was found to be lower than 17.9% reported by Nkafamiy *et al.* (2010). However, the crude protein of this study was also within the range of the findings of Osowe *et al.* (2021) 7.63 – 15.76%. The crude fibre content in this study was relatively high with a value of 21.03% which could be of great value in both human and animal nutrition. Studies have shown that fibres have the potential to reduce the rate of glucose absorption as well as reduce insulin secretion, which is of great importance in diabetic patients (Mbakwem-Aniebo *et al.*, 2012). Various studies have suggested leaf meals from tropical vegetables and herbs as protein sources in animal nutrition (Oloruntola *et al.*, 2021). This shows that the composite leaf mix could be used as a dietary protein source in animal nutrition.

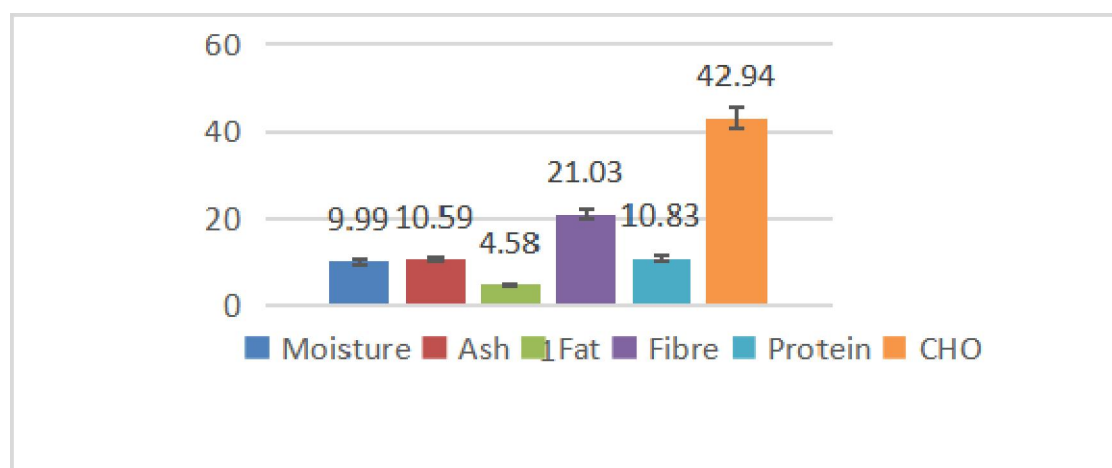


Fig. 1: Proximate composition of Composite Ficus species leaf powder

s species leaf powder

Phytochemical Composition of Composite Ficus species leaf powder

Table 2 shows the phytochemical composition of the composite *Ficus* spp, which contains phenol, flavonoids, alkaloids tannins, phytates, anthraquinone, cardiac glycosides 199.87, 184.62, 27.83, 16.46, 69.21, 13.24, 16.45, 54.5mg/100g respectively. The tannins and flavonoids found in the composite mix support its potential as an anti-microbial, anti-inflammatory, and anti-tumour agent and a means of removing harmful free radicals and reactive oxygen species (Teite *et al.*, 2013). Osowe *et al.* (2012) their investigation recorded 15.69 -56.52mg/g phenols in *F. carica*, *F. exasperata* and *F. thonningii* leaf powders which implies that they could be a good source of phenols when supplemented in the dietary intake of humans and livestock. Saponins are essentially dietary supplements as well as exhibiting anti-microbial properties. They are beneficial in modulating blood lipids, reducing cancer risk, and improving blood glucose response and antioxidant properties (Igidi and Edene, 2014). In Table 2, this study has 199.87mg/g of phenol which could be good for dietary purposes. The leaf powder of the composite mix contains an appreciable amount of saponins and it is suspected of possessing anti-microbial potentials, this shows that the leaf powder has various pharmacological qualities, including antihypertensive, anti-arrhythmic, anti-malaria, and anti-cancer activities, which is consistent with Saxena *et al.*, (2013) findings. Phytate is an anti-carcinogenic that protects against colon cancer, as well as a possible antioxidant that inhibits Fenton processes that lead to lipid peroxidation and polyphenol oxidase inhibition (Agte *et al.*, 1999). Therefore, phytate concentrations (69.21) reported for the composite mix could be of benefit. Anthraquinones on the

other hand are known to have remarkable bioactive properties. Some of these compounds stand out because of their anticancer, antitumor, anti-inflammatory, antiarthritic, antifungal, antibacterial, and antimalarial activities, among others (Gaspar Diaz-Mun[~]*et al.*, 2018). The realization of these advantages depends on various factors, such as the extent of dietary incorporation, the specific animal species consuming the feed, and the overall composition of the feed.

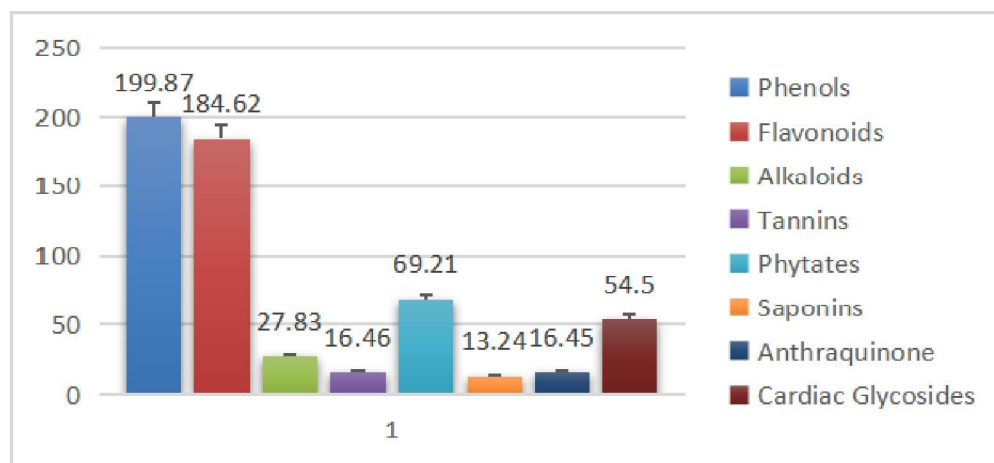


Fig. 2: **Phytochemical Properties of Composite *Ficus species* leaf powder**

CONCLUSION

In **CONCLUSION**, the proximate composition analysis of the composite mix derived from three *Ficus* species provides a comprehensive overview of its nutritional and pharmacological potential. This shows its multifaceted benefits, positioning it as a versatile resource for both human and animal nutrition. The composite mix contains a significant number of nutrients and phytochemicals as a result, the composite mix could be employed as a natural feed supplement in animal nutrition. Furthermore, the consistent alignment with previous studies underscores the reliability of these findings and opens avenues for further research as it is needed to assess the efficacy of the composite leaf powder as feed supplements on animal performance and health also finding the specific applications and optimal utilization of this *Ficus*-derived composite in dietary contexts.

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