



## MINERAL AND PHYTOCHEMICAL COMPOSITION OF AFRICANA PARQUETINA AQUEOUS EXTRACT

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### Abstract

Herbs as antibiotic has been propagated by FAO which has led to increase in organic farming. *Africana parquetina* also known as bullock is one of the numerous valuable medicinal plants from tropical Africa that have been used medically all over the world. To ascertain the medicinal fitness of *Africana parquetina* in livestock production, this research evaluated the phytochemical constituent of African parquetina leaf. African parquetina leaf was harvested from the Ilaro Forest Reserve, Ogun State. Four hundred grammes was weighed into a litre of water and soaked for 72 hours. It was afterwards filtered. The filtrate was taken to the laboratory for analysis. Phytochemical and mineral evaluation revealed that African parquetina leaf extract contains alkaloids (0.22 mg/100g), glycosides (0.01 mg/100g), flavonoids (5.89 mg/100g), phenols (0.11 mg/100g), saponin (0.5 mg/100g), tannin (0.04 mg/100g), steroids (0.00 mg/100g), Mn (1.09 mg/kg), Na (159.11 mg/kg), K (594.51 mg/kg), Ca (161.25 mg/kg) Fe (1.05 mg/kg) Cu (0.14 mg/kg) Se (68.24 mg/kg) Zn (1.09 mg/kg). The findings indicated that the African parquetina leaf extract has good nutritional quality due to high mineral concentrations, particularly calcium and potassium, and the resulting phytochemical properties. It was concluded that it could be used as feed additives in monogastric animal production.

**Keyword:** African parquetina, aqueous extract, mineral composition, phytochemical composition

### Introduction

There has been an increase in the demand for poultry product because chicken meat has low iron content (Farell *et al.*, 2010) and the desired unsaturated fatty acid (Apple *et al.*, 2010). Hence, it is preferred as healthy and nutritious compared to beef and mutton. Basically, poultry producer use growth promoter (such as polamix, anidone, multivitamin, albiovit e.t.c) containing antibiotics at sub-therapeutic levels to improve growth and general health of birds. This resulted in the accumulation of chemical residue in the bodies of the birds, which can be transmitted to humans (Achilonu *et al.*, 2018) making them resistant to some antibiotics. According to reports (Carvalho *et al.*, 2016), chemical growth promoters given to birds are discharged into the environment through their urine and feces. For poultry industry to meet the growing demand for protein there is need for a natural growth enhancer that would encourage growth and improve the overall health of the birds without interfering with the supply of human food. (Moreki *et al.*, 2014). Phytogenic growth promoters are becoming increasingly used due to their various therapeutic capabilities and lack of negative side effects in poultry production (Taer *et al.*, 2020). They improve livestock productivity through enhanced nutrient digestibility, absorption and elimination of pathogens in the gut (Kikusat *et al.*, 2020). Due to the presence of biologically active ingredient in these medicinal plants, there usage as anticancerous, anti-microbial and anti-inflammatory agents (Tomescu *et al.*, 2015) has become rampant.

African Parquetina (*Parquetina nigrescens*), is a shrub that grows in West Africa. Its leaves, root, and latex have all been utilized for generations in traditional medicine (Owoyele *et al.*, 2011). The leaves have been reputed for treatment of helminthiasis and rheumatism (Owoyele *et al.*, 2011). To ascertain the usefulness of this plant, it is important to evaluate its phytochemical composition so as to determine its suitability as a replacement for the antibiotics growth promoters AGP. This research is therefore carried out to determine the phytochemical and mineral constituent of African Parquetina aqueous extract.

### Materials and methods

#### Experimental Site

The field experiment was carried out at the Organic Laboratory, University of Lagos and Chemistry Laboratory, Federal Polytechnic Ilaro, Ogun State, Nigeria. These laboratories are situated in the South Western part of Nigeria.

#### Sources and preparation of African Parquetina aqueous extract



African Parquetina leaf was harvested from the Ilaro Forest Reserve, Ogun State, Nigeria. The leaves were rinsed to remove dirt after which 400 grammes was weighed and soaked in one litre of water for 72 hours and stirred vigorously at 12hours intervals. The mixture was filtered with muslin cloth to obtain a clear solution which was taken to the laboratory for analysis.

### Data Collection

Data on the mineral and phytochemical constituent was recorded.

### Result and Discussion

Table 1: Mineral and Phytochemical composition of African parquetina

Mineral content		Phytochemicals (Qualitative)		Phytochemicals (Quantitative)	
Mn (mg/kg)	1.09	Alkaloids	+	Alkaloids (%)	0.22
Na (mg/kg)	159.11	Saponin	++	Saponin (g/g)	0.55
K (mg/kg)	594.51	Phenolics	++	Phenolics (mg/g)	0.119
Ca (mg/kg)	161.25	Flavonoid	+++	Flavonoids (mg/g)	5.89
Fe (mg/kg)	1.05	Steroids	-	Steroids (mg/g)	0.00
Cu (mg/kg)	0.14	Tannins	+	Tannins (%)	0.04
Se (mg/kg)	68.24	Glycosides	-	Glycosides (%)	0.00
Zn (mg/kg)	1.09	Terpenoids	-	Phytic acid (%)	0.01

+++ Present in high amount, ++ Present in moderate amount, + Present in low amount,

- Not present

The alkaloids were present in low amount in the quantitative analysis which suggests that increasing the extract is necessary to achieve moderate level. Flavonoids and phenolics were also present. Flavonoids have been discovered to be helpful in the production of drugs, food, feed, and beverages. According to Farombi and Owoeye (2011), bitter leaf flavonoids, particularly phenolic acids, have an inhibitory effect on bacteria. Saponin was also present in moderate amount in the leaf extract. Tannins were also present in low amount.

Phytochemical constituents of Africana Parquetina leaf extract indicated that it contained alkaloid, saponin, tannin, glycosides and flavonoids and this is in agreement with previously reported studies (NRC, 1994; Oloruntola et al., 2018). Also, the results of the phytochemical screenings were in line with the reports of Banjoko et al. (2020) who observed the presence of tannin, phenol, saponin, alkaloids, flavonoids, terpenes, steroids, glycosides and phytate for *Carica papaya* leaf meal.

The results were also in similarity with the observations of Airaodion et al. (2019) that *Parquetina nigrescens* leaf contained alkaloid, saponin, tannin, flavonoid and phenols. The presence of high levels of flavonoids in Africana parquetina leaf extract suggests that the plant may have beneficial effects on immune system modulation and oxidative stress avoidance, as well as good blood glucose lowering characteristics by limiting dietary glucose absorption in the gastrointestinal tract (Adelowotan et al., 2008). The value observed for alkaloid was at variance



with the value of 0.0363% reported for *Parquetina nigrescens* leaf by Airaodion et al. (2019). This variation might be due to variation in the method of extraction as Airaodion et al. (2019) soaked the leaves in water for 72 hours before cold extraction as against the method used in the present study. In this study, it was also observed that the concentration of flavonoids obtained in this study was significantly higher when compared with the value of 0.03% reported by Airaodion et al. (2019) and 1.40 g/100g reported for *Phyllanthus niruri* leaf by Olufayo et al. (2021). Flavonoids are powerful natural antioxidants that scavenge free radicals and guard against degenerative illnesses like cardiovascular disease (Bisio et al., 2017; Cragg and Newman, 2013; Milella et al., 2016). The results showed that the value obtained for glycosides (0.01 mg/100g) was lower than the value of 0.366 mg/100g reported by Banjoko et al. (2020) for *Carica papaya* leaf meal. The variation in results could be as a result of different test ingredient used for the study. Saponin has a number of significant pharmacological properties, including antibacterial and antifungal properties (Odebiyi, 1978; Cheeke, 2000; Soetan et al., 2006). The value of tannin obtained in this result (0.04 mg/100g) was in agreement with the report of dubuisi-Ogbonna (2021) 0.04 mg/100g for *Citrus sinensis* fruits. The levels of tannins above 5% in the diet are often lethal (Reed, 1995) and the tannin content found in this study is lower thus confirming the safety in the consumption of African parquetina leaf extract by livestock especially monogastric animals. Tannins have the potentials to inhibit the proliferation of yeast, fungi, viruses and bacteria (Prohp and Onoagbe, 2012). Once they surpass their acceptable values, phytic acid mask important dietary minerals like zinc, calcium, iron and magnesium and render them biologically inaccessible for absorption (Alagbe et al., 2018; Musa et al., 2020).

Generally, minerals from plant sources are less bio-available than those from animal sources. As presented in the Table, African parquetina leaf extract contained silicon, iron, calcium, potassium, manganese, sodium, copper and zinc. Sodium, calcium and potassium are in relatively high amounts. According to Oluyemi et al. (2006), anemia and other illnesses can be prevented by including iron in the diets of pregnant women, nursing mothers, new moms, convulsing patients, and elderly people. The mineral profile showed that African parquetina leaf extract has high values of sodium, potassium and calcium. This finding further shows that continuous usage of African parquetina leaf extract by livestock may be required to maintain strong bones, regulate muscular contraction and relaxation, lower blood pressure, and aid in the synthesis of hemoglobin due to the plant's high potassium and iron content.

## **Conclusion**

In summary, it was observed that African parquetina aqueous extract is highly nutritious (as validated by its mineral and phytochemicals analyses). They can therefore act as medicinal remedy to livestock diseases especially in poultry farming. African parquetina leaf extract also have the potential of being a possible replacement for antibiotics especially for monogastric animals.

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