ORIGINAL RESEARCH
WWW.BIOINGENE.COM/PSJ
Bioingene PSJ

ISSUE NO. 1 VOLUME NO. 3

# PROXIMATE COMPOSITION AND PHYTOCHEMICAL SCREENING OF *IPOMEA ASARIFOLIA* LEAF MEAL (IALM) IN SEMI-ARID ZONE OF NIGERIA

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Article No. : D31MEY21R39
Article type: Original research
Received: 31 May 2021
Accepted: 10 August 2021
Online: 30 August 2021

**KEYWORDS**

Ipomea asarifolia,
Semi-Arid,
Phytochemical,
Proximate

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**Conflict of interest:** No

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## ABSTRACT

This research was carried out to determine the proximate and phytochemical Screening of *Ipomea asarifolia* leaf meal (IALM). The leaves were collected from the premises of Kano University of Science and Technology, Wudil, Nigeria. The leaves were dried in a well-ventilated area, and the samples were taken to the laboratory for analysis. From the results, it can be seen that IALM was rich is crude protein (15.58%), ether extract (0.75%), dry matter (94.99%), crude fibre (14.22%), ash (5.01%), and metabolizable energy of 1275.67 Kcal/kg. The results show the presence of various phytochemical constituents in the extract of IALM. It was reported with oxalate (3.60 mg/g), phytate (2.21%), tannin (0.014%), saponin (4.90%), flavonoid (3.25%), alkaloid (2.78%), and total phenolic with 15.75 mg GAE/100 g, respectively.

**Citation:**
Getso, M. M., Hassan, A. M., and Tamburawa, M. S. (2021). Proximate composition and phytochemical screening of Ipomea asarifolia leaf meal (IALM) in semi-arid zone of Nigeria. Bioingene PSJ, Issue 1, Volume 3, Article D31MEY21R39, Page 1-5. http://bioingene.com/wp-content/uploads/2021/08/D31MEY21R39.pdf

# 1. INTRODUCTION

*Ipomoea asarifolia* (Convolvulaceae) is a glabrous succulent long-trailing perennial plant, found throughout West Africa. It is a weed of hydromorphic soils, growing in low lying and inland valleys, streams and river banks. In Nigeria, it is known by the traditional names Duman kada in Hausa and Gboro ayaba in Yoruba (Jegede *et. al.*, 2009).

The plant has purple flowers (Figure 1) which develop three seeds for sexual propagation. Asexual propagation can also be achieved by stolon. In Nigeria, the leaf of *Ipomea asarifolia* is generally not consumed by either humans or livestock. It mostly grows like a weed and is popularly used as compost materials, ethno - veterinary and human medicine practice and mulch (Nasir *et al.*, 2018). It provides a high crude protein level, metabolizable energy and rich mineral profile at negligible cost (Ekenyem and Madubike, 2006).

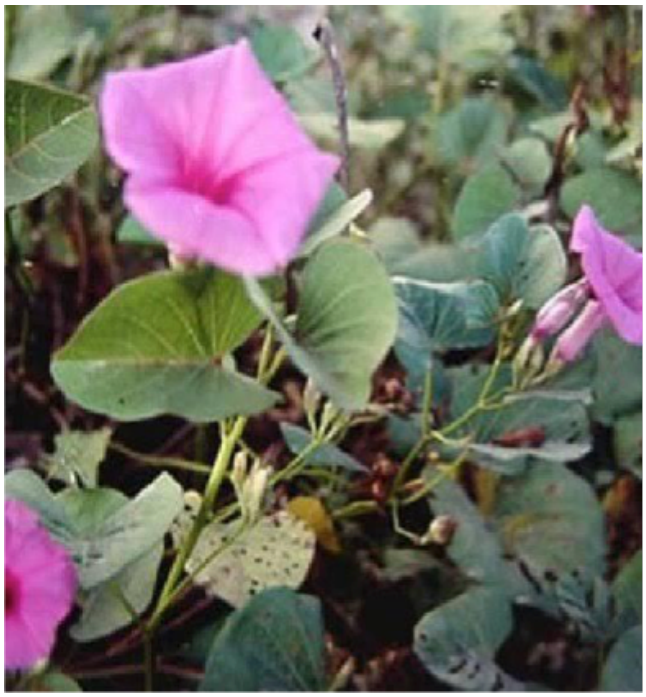

**Figure 1**. *Ipomea asarifolia*

# 2. MATERIALS AND METHODS

## 2.1 STUDY AREA

The experiment was conducted at the Department of Animal Science, Kano University of Science and Technology, Wudil, Kano State, Nigeria. The area lies between the longitude and latitude of 8o51" East and 11o49" North at an altitude of 403 m above sea level. The average annual rainfall ranges from 850-870 mm, while the minimum and maximum temperature is 26 ℃ and 33 ℃, respectively (Olofin *et al.*, 2008). The environment is conducive for different species of livestock and is favored with abundant grasslands for grazing.

## 2.2 SOURCE AND PREPARATION OF IPOMEA ASARIFOLIA LEAF MEAL

Fresh and blooming Morning Glory (*Ipomoea asarifolia*) leaves were harvested from the bush and fallow sections of the Kano University of Science and Technology, (Wudil, Nigeria) premises and environs. The leaves were chopped and dried in a well-ventilated room for 3-5 days until they became crispy to touch while retaining their greenish coloration. The dried leaves were then milled using a hammer mill with a sieve size of 3.15 mm to produce the leaf meal.

## 2.3 PROXIMATE ANALYSIS

Sample of the air-dried leaves were taken to the laboratory for proximate composition analysis to determine crude protein, crude fibre, ether extract, Nitrogen free extract and some mineral components using standard procedures of the Association of Official Analytical Chemist (AOAC, 1990).

## 2.4 PHYTOCHEMICAL SCREENING

Eighty five grams (85g) of the powdered plant material was soaked in water and methanol respectively. The mixture of each solvent was agitated in a mechanical shaker overnight, filtered and concentrated using a water bath. It was then transferred to a Soxhlet apparatus, the filtrate was evaporated and the residues were used for phytochemical analysis. The methods described by Cannel (2000) and Hassan *et. al.*, (2004) were used for the phytochemical screening.

# 3. RESULTS AND DISCUSSION

## 3.1 PROXIMATE COMPOSITION OF IPOMEA ASARIFOLIA LEAF MEAL (IALM)

The result of the proximate composition of *Ipomea asarifolia* leaf meal is shown in Table 1. From the Table, it can be seen that IALM was rich is crude protein (15.58%), ether extract (0.75%), dry matter (94.99%), crude fibre (14.22%), ash (5.01%), and metabolizable energy of 1275.670 Kcal/kg.

The crude protein (CP) (15.58%) of IALM reported in this study was at variance with the CP value of 31.7% reported by Lawal *et al.* (2018) in *Ipomea asarifolia* hay. This variation was caused due to the composition of the plant used. This research used pure leaf in making the meal, while Lawal *et al.* (2018) used the composition of straw, leaves, fruits, and seeds of *Ipomea asarifolia* for producing the meal. Oduro *et al.* (2008), and Yamego *et al.* (2011), reported CP value of *Moringa oleifera* leaf meal of 27.51%, and 27.20% which are all higher than that of IALM as - reported in the present research.

From various observations, CP in IALM was lower than that of soybean meal (44%) that is conventionally used as a protein source in rabbit rations but it was higher than a number of other forages like Butterfly pea (*Centrocema pubescens*). Mahima *et al.* (2014) reported crude protein of 14.12% in *Moringa oleifera* which is lower than the CP (15.58%) reported in this study. Almost similar to this study, Ogbe and Affiku (2011) reported the crude protein value of *Moringa oleifera* leaves as 17.01% while the other previous studies conducted by Olugbemi *et al.* (2010) and Mutayoba *et al*. (2011) reported the crude protein value of 27.44 and 30.65% in leaves of *Moringa oleifera*, respectively.

The values (0.75 and 14.22%) obtained for ether extract (EE) and crude fibre (CF), respectively in the present study were at variance with the results of the Lawal *et al.* (2018) who reported 7.8% EE and 17% CF, respectively in Ipomea asarifolia hay. The previous study of Mahima *et al.* (2014) reported a higher value of ether extract (2.525%), and ash content (9.15%). The crude fibre (14.22%) reported in this study was at variance with that of Mahima *et al.* (2014) who reported crude fibre of 23.09% in leaves of *Moringa oleifera*.

The energy content (1275.67 Kcal/Kg) reported in this study was lower than 2760 Kcal/kg, and 2752 Kcal/kg as reported by Ekenyem and Madubuike (2006), and Lawal *et al*. (2018). The variations in the nutrients could be attributed to the age of the plant at harvesting, climatic conditions, agronomic practices as well as methods of processing and analysis (Fuglie, 2001; Fahey, 2005).

## 3.2 PHYTOCHEMICAL SCREENING IALM

The results show the presence of various phytochemical constituents in the extract of Ipomea asarifolia leaf meal (Table 1).

Table 1. Result of phytochemical screening of *Ipomea asarifolia* leaf meal (IALM)

| Parameters | Values |
|---|---|
| Oxalate | 3.60 mg/g |
| Phytate | 2.21% |
| Tannin | 0.014% |
| Saponin | 4.90% |
| Flavonoid | 3.25% |
| Alkaloid | 2.78% |
| Total phenolic | 15.75 (mg GAF/100g) |

The result of this study shows that *Ipomea asarifolia* leaf meal contained oxalate, phytate, tannin, saponin, flavonoid, alkaloid, and total phenolics. With respect to that, the presence of saponin, tannin, alkaloid, phenol, and sterols in Ipomea asarifolia leaf agrees with the report of Jegede *et al.* (2009). Moreover, Aliyu *et al.* (2011) also reported the presence of saponin, flavonoid, tannin, alkaloid and glycosides in leaf extract of Ipomea asarifolia. The presence of flavonoid reported in this study was in variance with that of Jegede *et al.* (2009) who reported the absence of flavonoid in leaf extract of Ipomea asarifolia but agreed with Aliyu *et al.* (2011) who reported it to be present in the aqueous extract.

# 4. CONCLUSION

Based on the analysis, it is confirmed that *Ipomea asarifolia* leaf meal contains a high nutritive profile that has the potential to fortify the animal feed when included in the ration. However, it contains some antinutritional factors that will negate its utilization by animals as they are toxic. Nevertheless, it can be utilized by - rabbits due to their well developed cecum. Based on the present study, the following recommendations can be stated:

1. Feeding trials should be carried out on different classes of animals so as to find out the possibility of utilizing the Ipomea asarifolia by such animals.
2. The leaf meal should be included in graded levels.

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## FUNDING

None