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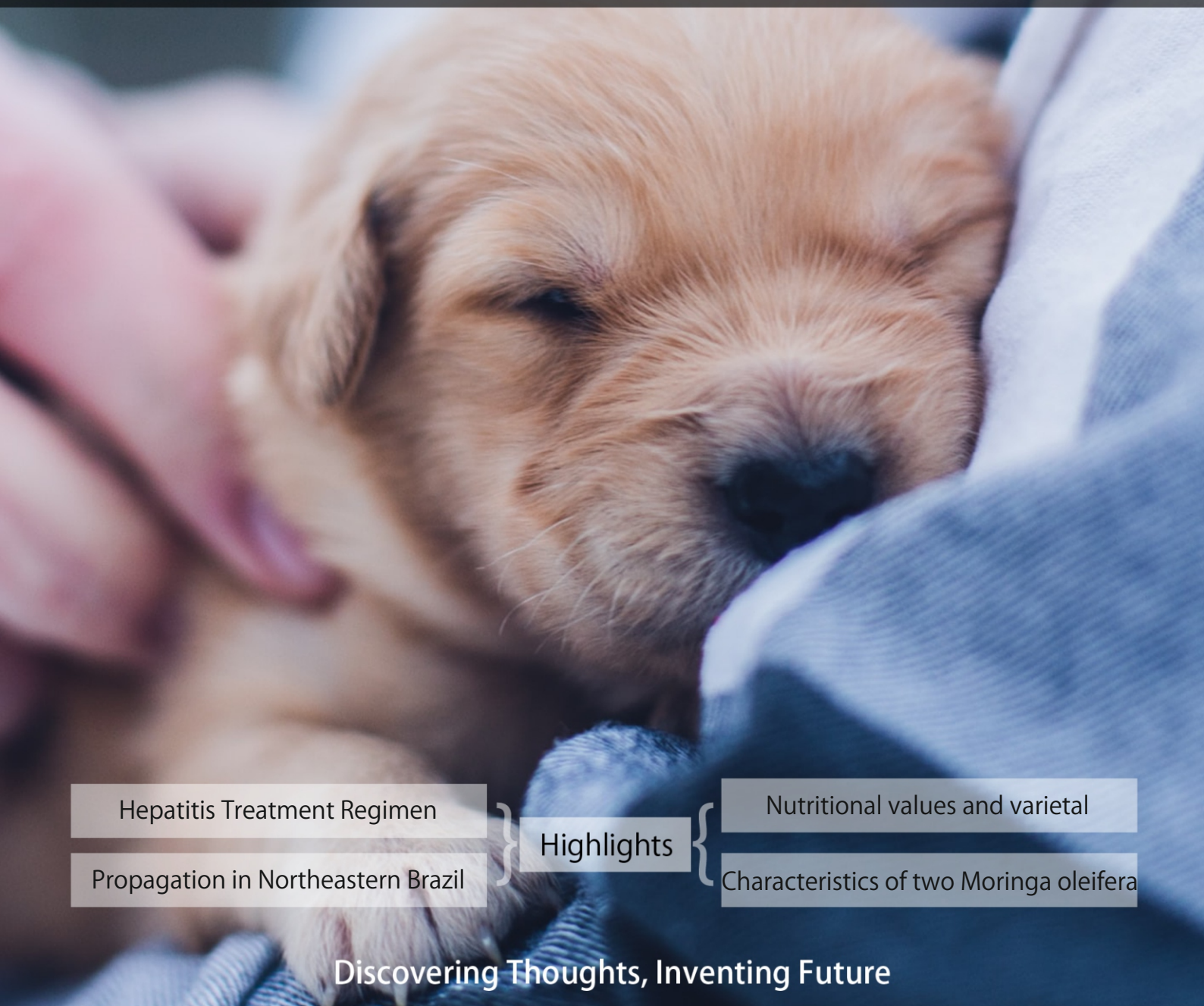

Hepatitis Treatment Regimen

Propagation in Northeastern Brazil

Highlights

Nutritional values and varietal

Characteristics of two Moringa oleifera

Discovering Thoughts, Inventing Future

VOLUME 25 ISSUE 1 VERSION 1.0

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Nutritional values and varietal characteristics of two *Moringa oleifera* Lam. Morphotypes from Chad

By Barnabas Kayalto, Christophe Djekota & Abdelsalam Tidjani
University of N'Djamena

Abstract- This study aims to compare the nutritional value of leaf powder from two morphotypes of *Moringa oleifera* Lam. from Chad. In 2024, at Kolobo in the Mayo Kebbi Province in southern Chad, fresh leaf samples were collected from a large-leaf morphotype 1 of *Moringa oleifera* Lam.; the small-leaf morphotype 2 having been analyzed at CRSBAN in a previous study. The freshly harvested leaves were transported by us, sorted, washed and dried in the shade. The powders prepared from the dried leaves were analyzed using standard methods. Physico-chemical analyses revealed that leaf powder from the small-leaf morphotype 2 is rich in protein (24.28 ± 0.22 g/100g), certain minerals (mg/100g) such as: Ca 1443.90 ± 11.03; Mg 176.72 ± 0.73; Fe 53.75 ± 5.07; Zn 17.58 ± 0.89 and vitamins (β-carotene 624.40 ± 0.41μg ER, Vitamin C 65.88 ± 0.00 mg/100g).

Keywords: *Moringa, comparative study, nutritional value, morphotypes, chad.*

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Abstract- This study aims to compare the nutritional value of leaf powder from two morphotypes of *Moringa oleifera* Lam. from Chad. In 2024, at Kolobo in the Mayo Kebbi Province in southern Chad, fresh leaf samples were collected from a large-leaf morphotype 1 of *Moringa oleifera* Lam.; the small-leaf morphotype 2 having been analyzed at CRSBAN in a previous study. The freshly harvested leaves were transported by us, sorted, washed and dried in the shade. The powders prepared from the dried leaves were analyzed using standard methods. Physico-chemical analyses revealed that leaf powder from the small-leaf morphotype 2 is rich in protein (24.28 ± 0.22 g/100g), certain minerals (mg/100g) such as: Ca 1443.90 ± 11.03; Mg 176.72 ± 0.73; Fe 53.75 ± 5.07; Zn 17.58 ± 0.89 and vitamins (β-carotene 624.40 ± 0.41µg ER, Vitamin C 65.88 ± 0.00 mg/100g). The leaf powder has a low lipids and total sugars content, respectively (7.42 ± 1.56 g/100g) and (22.46 ± 2.02 g/100g). Dried *Moringa oleifera* broadleaf powder has a low protein content (6.09 ± 0.15 g/100g). Its lipid content is even lower (0.52 ± 0.02 g/100g). However, this morphotype 1 has an ash content (9.94 ± 0.05 g/100g) similar to the *Moringa* morphotype 2 with small leaves, which suggests a high mineral content.

These results show that the small-leaf morphotype 2 produced a significantly higher protein, certain minerals and β-carotene content than the large-leaf morphotype 1. This study is a contribution to the nutrition program for children and people with HIV.

Keywords: Moringa, comparative study, nutritional value, morphotypes, chad.

I. Introduction

Moringa oleifera Lam. belongs to the monogeneric shrubs and trees family Moringaceae, considered to have originated in Agra and Oudh, in the north-western region of India and south of the Himalayan mountains (Mallenakuppe *et al*., 2019). It is now grown throughout the Middle East, almost all of the tropical belt and was introduced to East Africa from India in the early 20th century. Around 33 species have been recorded in the Moringaceae family. Of these, thirteen species namely, *M. arborea*, *M. borziana*, *M. concanensis*, *M. drouhardi*, *M. hildebrandtii*, *M. longituba*, *M. oleifera*, *M. ovalifolia*, *M. peregrina*, *M. pygmaea*, *M. rivae*, *M. ruspoliana*, *M. stenopetala* are well known and occur worldwide (Mallenakuppe *et al*., 2019).

Melom *et al*., (2016) studied the morphological characteristics of different local varieties of *Moringa oleifera* in the Logone valley (Chad-Cameroon). These authors showed that the most decisive parameters, i.e. leaf length and width, capsule length and number of seeds per capsule, using Hierarchical Ascending Classification (CAH) enabled them to identify three morphotypes of *M. oleifera* individuals in the area. Morphotype 1, morphotypes with large leaves, the most represented with 43% of individuals; morphotype 2, morphotypes with small leaves, moderately represented with 33% of individuals and morphotype 3, the least represented, with 24% of individuals. The general characteristics of the three morphotypes are described below.

Morphotype 1:

The bipinnate and tripinnate compound leaves are imparipinnate quadripinnate, 38.95 ± 1.48 cm long and 22.64 ± 0.86 cm wide. The petioles are cylindrical, pubescent, with a thickened base and a small linear depression on the ventral part. The pale green rachis, also cylindrical, are less pubescent. The leaflets have a wedge-shaped, obtuse base and a mucronate apex; they are oval, green ventrally and greenish dorsally. The larger terminal leaflet is short-stalked, more or less glabrous, oval to rounded. The pinnate veins are barely visible (Melom *et al*., 2016).

The panicle-shaped flowers are tubular, whitish and 3.54 ± 0.07 cm long. The five sepals, 1.46 ± 0.03 cm long, are obovate and tinged with red behind their apex. The five petals are also obovate, with inward-curving edges and a mucronate apex. They are also tinged red at the base, with red and/or yellow spots. The androecium contains yellow anthers, while the filaments are yellowish and less pubescent. The five stamens, 1.07 ± 0.024 cm long, are fused at their more pubescent base. The pistil is green and pubescent. In the flower buds, the stamens are often separated by staminodes.

The linear, angular, 3- or 4-sided capsules are on average 31.75 ± 1.20 cm long with 2 grooves on

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each side; they are more or less beige to greyish when ripe. They are large fruits, appearing round; they are straight, but sometimes curved entirely, either at the base or at the beaks. The beaks are straight or curved, with pointed or sharp tips, while others are thin, pointed or sharp. At maturity, the capsules contain an average of 11.00 ± 2.83 seeds. The seeds are spherical, round, with a brown and/or pale-brown, semi-permeable shell. The shell has three white wings, which extend from the base to the top (Melom *et al*., 2016).

Morphotype 2:

The leaves are imparipinnate, of the same type as group 1, but 34.82 ± 1.48 cm long and 20.05 ± 0.86 cm wide. The green and sometimes reddish petioles are more pubescent than the pale green rachis; they also have a short linear depression on the ventral surface. The leaflets have a wedge-shaped base with an obtuse, wedge-shaped, mucronate apex; they are oval, green ventrally and greenish dorsally.

The flowers, 3.29 ± 0.07 cm long, are white, cruciform or tubular and pubescent. The sepals, which are moderately long (1.31 ± 0.11 cm), are also obovate, while the five petals are oblong. The stamens are shorter than those above (1.01 ± 0.02 cm).

The fruits are slender, slightly longer (33.11 ± 4.59) than those of group 1 and generally have 3 sides. The capsules are straight, but sometimes entirely curved, either at the base or at the beak. Some beaks are rounded, mucronate or simply acuminate. The capsules contain an average of 11.00 ± 2.94 brown and/or pale brown to black seeds (Melom *et al*.,2016).

Morphotype 3:

Individuals in this group have shorter leaves (31.48 ± 1.48 cm long), with greyish to reddish, pubescent petioles. They are cylindrical, thickened at the base with a short linear depression on the ventral surface.

The green rachises have oval leaflets with an obtuse base and mucronate apex, with a green upper surface and greenish lower surface.

The medium-length flowers (3.45 ± 0.07 cm) are white with white sepals that are longer (1.40 ± 0.03 cm) than those of group 2. The petals, spotted red at the base, are obovate. The stamens are moderately long (1.05 ± 0.02 cm) compared to the first two groups.

The capsules are relatively short (26.87 ± 1.20 cm) and have 3 or 4 sides. They are straight, but sometimes entirely curved, either at the base or at the beak. The beaks are straight and/or curved, with rounded mucronate or pointed tips. Mature fruits contain an average of 10.80 ± 4.54 seeds of the same color as those in group 2 (Melom*et al*., 2016). In the context of this study, leaf morphology could guide the choice of morphotypes depending on the intended use. Morphotypes 2 and 1 are best suited to green fruit production in the Logone valley. However, given the flocculent capacity of Moringa oleifera fruit fines, the study should be completed by yield tests in order to propose the morphotype best suited to maximum powder production (Foidl, Harinder & Becker, 2001).

Moringa is known as the "tree of life" or the "tree of heaven" because of its exceptional environmental, medicinal and dietary virtues. Its leaves, flowers, fruit, bark and roots can be eaten directly. Its recognized nutritional qualities could well represent an effective solution in the fight against malnutrition (Solidarités International, 2019).

All parts of the *Moringa oleifera* plant (leaves, roots, flowers, pods and seeds) are edible and contain large quantities of various micronutrients, such as calcium, potassium, zinc, magnesium, iron, copper, vitamins (A, B, C, E) and phytochemicals such as tannins, sterols, terpenoids, flavonoids, saponins, anthraquinones, alkaloids and reducing sugars (Trigo *et al*., 2021).

Moringa oil also contains around 76% linolenic acid and oleic acid, making it a potential substitute for olive oil. *Moringa* leaves contain an exceptionally high amount of protein compared with other leaves consumed as food, and essential amino acids such as lysine, tryptophan, phenylalanine, valine, etc. (Trigo *et al*., 2021).

In developing countries, the desire to ensure food security requires intensive, input-intensive farming, which makes produce inaccessible to the majority of farmers (Ngamo, 2004). As a result, farmers continue to face unstable conditions of food insecurity. This is why new techniques that solve both the problem of food insecurity and the conservation of biodiversity have been developed in recent years, in particular agroforestry (Mapongmetsem and Zedong, 1997; De Jong, Campbell & Schröder, 2000). Agroforestry advocates the use and promotion of non-timber forest products, which can improve the living conditions of rural populations (Mapongmetsem *et al*., 2010). *Moringa oleifera*, a Middle Eastern species introduced to East Africa at the beginning of the 20th century as an ornamental and protective plant (Foidl, Harinder and Backer, 2001), is one of these resources of great interest to the rural population. *Moringa* is a plant which requires less water and nutrients, with rapid growth and development; it is therefore well suited to tropical Sahelian countries.

Making the most of local plant resources that are rich in protein and micronutrients and accessible at low cost is an effective strategy for fighting nutritional deficiencies (Ndong *et al*., 2007; Anwar *et al*., 2007). It makes it possible to reduce micronutrient deficiencies and improve the nutritional and health status of malnourished children. A number of studies (Ndong *et al*., 2007; Saint Sauveur et Broin, 2010; Compaoré *et al*., 2011; Zongo *et al*., 2013; Kayalto *et al*., 2013) in many countries have highlighted the exceptional nutritional

qualities of the leaves of *M. oleifera* Lam. originally from India, which are used in powder form in porridges in Asia and Africa.

This study aims to compare the nutritional value of dried leaf powder from two morphotypes of *Moringa oleifera* Lam. from Chad.

II. Materials and Methods

a) Location of the Study Area

Fresh *Moringa oleifera* broadleaf leaves, Morphotype 1, were harvested in October 2024 in the village of Kolobo, 60 km south of Bongor, Koyom sub-prefecture, Mayo-Boneye prefecture, Mayo-Kebbi East province.

b) Sampling

In October 2024, in Kolobo, in the Province of Mayo Kebbi East in southern Chad, samples of fresh leaves were collected directly from a broad-leaved morphotype of *Moringa oleifera* Lam. These fresh leaves were transported to Bongor by us, sorted, washed and dried in the shade. The powder prepared from the dried leaves was carefully packed in clean plastic bags and sent to N'Djamena, to Foodstuffs Quality Control Center (CECOQDA) for physico-chemicals analysis using standard methods. It should be noted that *Moringa* broadleaf, Morphotype 1 was introduced at the Koyom missionary station, 8 km south of Kolobo by evangelist missionaries. It was originally a village pharmacy set up by the work of American doctor David Seymour in the 1950s, followed by Dr Thomas Zürcher in 1983. This pharmacy has since become the Evangelical Hospital of Koyom, renowned beyond Chad, particularly for the quality of its surgical services.

Source: Solidarités International, 2019

Photo 1: Moringa with Small Leaves, Morphotype 2 in Chad

Source: Photo KAYALTO 2024

Photo 2: Moringa with Broad Leaves, Morphotype 1 in Kolobo, Chad

c) Physico-Chemical Analyzes

Samples of *Moringa* leaf powder, Morphotype 1, were analyzed in the laboratories of the Foodstuffs Quality Control Center (CECOQDA) in N'Djamena, Chad. Moisture, ash and lipid content were determined using the MO PC method, while crude protein was analyzed using the MO PC EA method.

To enable us to make a comparison, we assayed the samples of *Moringa* with small leaves, Morphotype 2, from our previous work, using standard methods in the laboratories of the Centre for Research

in Biological, Food and Nutritional Sciences (CRSBAN) at the University Ouaga 1 Pr Joseph KI ZERBO in Ouagadougou, Burkina Faso. The samples were analyzed in duplicate.

i. *Determining Moisture*

The sample (5g) was oven-dried at 105 ± 2°C for 03 hours and the difference in weight gave the moisture content (AOAC 934.06, 1990);

ii. *Determining the Total Protein Content*

Total protein is determined by the Kjeldahl method (AOAC 920.87, 1990) based on total mineralization of the biological material in an acid environment, followed by distillation of the nitrogen in ammonia form. The mass of total plant protein is calculated using the formula: mass of nitrogen x 6.25 (FAO/WHO, 1978).

iii. *Determination of Lipids*

5 g of each sample was weighed and introduced into an extraction cartridge, covered by cotton. The cartridge was placed in a 150 ml glass Soxhlet. The solvent container was weighed and 400 ml of n-hexane was added. The soxhlet was then introduced into the container placed on the heating mantle, which was then connected to the cryostat cooling thermostat. Four to six siphoning processes were conducted over 5 hours. The heating mantle was disconnected. The solvent was then evaporated in a RE 121 Rotavapor (made in Switzerland). The container with the fat was placed in an oven for 3hours at 103°C, and then in a desiccator for 30 min and then weighed. The weight difference gives the fat content of the sample.

iv. *Determination of Total Sugars*

The determination of the total sugar content of the samples was performed in triplicate by spectrometric assay samples (Fox and Robyt, 1991). The reading of optical densities was made at 540 nm using a µquant type plate reader (Bio-tek instrument Serial No. 157904, USA) coupled with a computer running KC integrated Junior (v1.31.5) software.

v. *Détermination of ash rate*

The sample (5 g) introduced in metal crucibles was mineralized in a muffle furnace (type VOLCA V50) at 550°C for five (05) hours, removed using thongs and then cooled in a desiccators for about one (01) hour before being weighed. The difference in weight gives the ash content of the sample (AOAC, 1990);

vi. *Determination of Minerals*

Mineralization was achieved through dry ashing. The ash obtained contains major elements (Na, Ca, Mg, K, etc.) and trace elements (Fe, Zn, etc.). These minerals were determined by *Atomic Absorption Spectrometry (*Pinta, 1973)(with a PELKIN Elmer model 3110 device (Connecticut, USA). A hollow Al-Ca-Cu-Fe-Mg-Si-Zn cathode lamp was used.

vii. *Calculation of the Energy Value*

The energy value corresponding to the available energy was calculated using [18] coefficients, coefficients adopted by the United Nations Food and Agriculture Organization (FAO) in 1970:

$$X = (P \times 4) + (G \times 4) + (L \times 9)$$

Where *P* = protein percentage, *G* = carbohydrates percentage, *L* = lipids (fats) percentage and *X* = energy value in Kcal/100g.

viii. *Statistical Analysis*

All assays were carried out in triplicate, and the averages and Standards Deviations (SD) calculation have been done with the software Exceland then transferred to Word version 2013.

III. Results

Knowledge of the physico-chemical composition of *Moringa* is an important factor in its development.

a) Physico-Chemical Parameters of the Two Moringa Morphotypes

i. *Moringa Oleifera, Morphotype 2 Results*

Table 1 presents the results of chemical analysis obtained in the CRSBAN laboratories on dried leaf powder of *Moringa oleifera*, Morphotype 2.

Table 1: Nutritional value, per 100g, of *Moringa oleifera* leaf powder, Morphotype 2 (mean ± SD)

Nutrients	Value	[a]RDA
Energy (Kcal)	253,73	682[b]
Moisture (%)	9,31 ± 0,18	
Ash (g)	10,50 ± 0,07	
Protéins (g)	24,28 ± 0,22	10,28[c]
Fats (g)	7,42 ± 1,56	
Total Sugars (g)	22,46 ± 2,02	
Vitamins		
(β-carotène)	624,40 ± 0,41 µg ER	400
Vitamin C (mg)	65,88 ± 0,00	30
Minerals		
Iron (mg)	53,75 ± 5,07	11,6
Zinc (mg)	17,58 ± 0,89	8.4
Calcium (mg)	1443,90 ± 11,03	400
Magnesium (mg)	176,72 ± 0,73	54

RDA: Recommended Daily Allowance. [a]Joint FAO/WHO Expert Consultation, 2002. Vitamin and mineral requirements in human nutrition. Geneva: World Health Organization, 2002; [b]WHO (1998). Complementary feeding of young children in developing countries: a review of current scientific knowledge. UNICEF /University of California-Davis/WHO/ORSTOM. Geneva: WHO/NUT/98.1; [c]FAO/OMS/UNU, 1986. Energy and protein requirements. Report series.

The results obtained show that *Moringa oleifera*, Morphotype 2with small leaves, was more concentrated for most of the nutrients in our study, except for lipids (7.42 ± 1.56) and total sugars (22.46 ± 2.02): proteins (24.28 ± 0.22 g/100g), minerals, mg/100g: Ca 1443.90 ± 11.03; Mg 176.72 ± 0.73; Fe 53.75 ± 5.07; Zn 17.58 ± 0.89 and vitamins (β-carotene 624.40 ± 0.41µg ER, Vitamin C 65.88 ± 0.00 mg/100g). The high mineral content of *Moringa oleifera* powder is easily explained by its high ash content (10.50g per 100g).

ii. *Moringa from the Village of Kolobo, Morphotype 1 Results*

Table 2 shows the results obtained in the physical and chemical laboratories of CECOQDA, Department of Physical and Chemical Quality Control of Food, Water and Beverages, sample No. 0360/CECOQDA/DCQPC/2024 dated 05/11/2024. We have only obtained the results of analyzes of water, ash, protein and lipid content. For the rest, minerals and vitamins, CECOQDA is awaiting its order for reagents.

Table 2: Nutritional Value, per 100g, of *Moringa Oleifera* Leaf Powder from the Village of Kolobo, Morphotype 1

Nutrients	Value	[a]RDA
Moisture (%)	13,73 ± 0,12	
Ash (%)	9,94 ± 0,05	
Proteins (%)	6,09 ± 0,15	10,28[c]
Fats (%)	0,52 ± 0,02	

Table 3 shows the comparative chemical composition of macronutrients and ash in the two *Moringa oleifera* morphotypes.

Table 3: Comparative Macronutrient Composition of the Two Morphotypes of *Moringa Oleifera* (Mean±SD)

Morphotypes	Moisture (%)	Proteins (%)	Fats (%)	Ash (%)
Morphotype 2	9,31 ± 0,18	24,28 ± 0,22	7,42 ± 1,56	10,50 ± 0,07
Morphotype 1	13,73 ± 0,12	6,09 ± 0,15	0,52 ± 0,02	9,94 ± 0,05

IV. Discussion

Small-leaf *Moringa* is a nutrient concentrate, as shown by the results summarized in Table 1, except for lipids (7.42 ± 1.56) and total sugars (22.46 ± 2.02). In one of our previous studies (Barnabas *et al*., 2024), we used the powder of these leaves in the nutritional recovery of 416 moderately acutely malnourished children (MAM) at the Chagoua Hospital Notre Dame of Apostles (HNDA). The results of this study showed that moderately malnourished children given porridges with dried *Moringa* leaf powder took a maximum of three weeks to recover from malnutrition. The millet (Pennisetum typhoïdes) porridge with *Moringa* gave the best results, with 96% of children recovering after an average stay of 17.5 days. Children on red sorghum porridge from Bongor with *Moringa* showed the highest rate of haemoglobin gain at 13.5 g/dl. Children on maize

porridge without *Moringa* (control) took the longest to recover in the study, averaging 32.7 days.

Comparing our results with those of Compaoré *et al*. (2011) in Burkina Faso, *Moringa* from Burkina has a high lipid content (43.56 ± 0.03 g/100g) and a low total sugar content (9.17±0.25) which is the opposite for Chad, respectively 7.42 ± 1.56 g/100g for lipids and 22.46 ± 2.02 for total sugars.

Moringa broadleaf has a low protein content (6.09 g/100g) compared with *Moringa* obtained at Gounou Gaya. Its lipid content is very low (0.52 g/100g). However, this species has an ash content (9.94 g/100g) similar to the *Moringa* obtained at Gounou Gaya (10.50 ± 0.07 g/100g), which suggests a high minerals content that was not analyzed due to a break in the reagents at the time of our study.

Ndong *et al*. (2007) in Senegal, in their study of dried *Moringa oleifera* leaf powder, obtained higher results than ours, in terms of protein, carbohydrate, calcium, potassium, magnesium, ash and energy content. These values were respectively: 39.69 ± 0.01; 35.33; 1526.74 ± 50.03; 888.50 ± 38.30; 428.87 ± 85.96; 11.39 ± 0.66 and 358.73. As for iron and zinc content, we obtained 53.75 ± 5.07 and 17.58 ± 0.89 respectively, higher results than those obtained in their study, which were 18.86 ± 1.20 and 2.13 ± 0.07 respectively. However, in their study, Ndong *et al*. found low iron bioavailability (%) in dried *Moringa oleifera* leaf powder, i.e. 2.24 ± 0.65. Our results regarding the lipid content of dried *Moringa* leaves from Chad (7.42 ± 1.56 g/100g) are similar to those from Senegal, i.e. 7.85 ± 0.28.

As regards the minerals composition of broad-leaf *Moringa* leaves from Chad, the reagents for these analyses were not available at the time of our study in the laboratories of the Foodstuffs Quality Control Center (CECOQDA) in Chad. For information purposes, we give here the average values taken from page 209 of the FAO table of food composition for West Africa.

Table 4: Minerals (mg/100 g) in fresh raw *Moringa* leaves and fresh boiled leaves

Minerals	Fresh raw leaves	Fresh boiled leaves
Calcium	595	633
Iron	10,3	10,9
Magnesium	68	73
Phosphorus	91	103
Potassium	405	428
Sodium	9	10
Zinc	1,20	1,28
Copper	0,21	0,22

Source: Vincent et al, (2020), FAO/INFOODS food composition table for West Africa (2019), p.209

According to Manzo *et al*. (2016), in Niger, the use of local foods has been identified in the national protocol for the management of malnutrition as an alternative to the ready-to-use therapeutic foods currently in use. *Moringa* oleifera dried leaf powder was identified as one of these local foods. They analyzed four *Moringa* samples from the three main *Moringa* production regions in Niger, namely Tillabéri and Niamey in the river basin and the south of Maradi in the Sahelo-Sudanian zone. According to the above authors, the dried *Moringa* leaf powder produced in Niger was found to be rich in protein, with an average of 24.8%. Depending on the region, the composition varied between 51.9 and 55.12 mg/100g for iron; 0.45 and 1.58 mg/100g for zinc; 1192.5 and 1957.5 mg/100g for calcium; 414.37 and 714.37 mg/100g for magnesium; 1587 and 2037 mg/100g for potassium; 207.75 and 326.25 mg/100g for sodium; 32 and 61 mg/100g for phosphorus.

Our results for dried *Moringa* leaf powder from Chad are similar to those from Niger in terms of protein, iron and calcium. *Moringa* from Niger has an average magnesium content (551 mg/100g) three times higher than that from Chad (176.72 ± 0.73 mg/100g). On the other hand, dried *Moringa* leaf powder from Chad has a zinc content (17.58 ± 0.89 mg/100g) 19 times higher than that from Niger (0.92 mg/100g).

Moringa oleifera Lam. is a leafy vegetable that is very rich in nutrients and is increasingly recommended for populations suffering from malnutrition. *Moringa* leaves, commonly known in local Arabic as “Haloum”, are a staple food in some Chadian households. They are used in the preparation of sauces. “I use *Moringa* leaves to make sauce, and I boil the leaves to make herbal tea to treat malaria. I also use the roots of this plant to treat tooth decay. My children and me eat the seeds for stomach problems such as typhoid. I also use soaps made from *Moringa* to make my skin smooth”, these are the answers given by some of the women interviewed by Solidarités International. According to traditional healers, *Moringa* leaves have been around for centuries. People all over the world have used *Moringa* leaves as a food, but also for its medicinal properties (Solidarités International, 2019).

HOUNDJI *et al*. (2013) assessed the effect of a daily intake of 10 g of *Moringa oleifera* leaf powder on the nutritional status of moderately acutely malnourished children aged 6 to 30 months after 6 months of supplementation. Two groups were formed from 84 infants selected from a nutritional recovery center in the village of Lissèzoun (Centre-Benin): one received PFMo and the other, chosen as a control, did not receive this powder. The nutritional status of the children was assessed using anthropometric indicators. At the end of the 6 months, the results showed that daily supplementation with PFMo significantly improved the nutritional status of the children, both for wasting (Z-score Weight/Height of -1.0 ± 0, 9 at the start of the intervention to 0.7 ± 1.0 at the end of 6 months), stunting (Z-score Height/Age from -2.6 ± 0.7 to 0.4 ± 0.7) and underweight (Z-score Weight/Age from -2.2 ± 0.6 to 0.7 ± 0.7). The improvement in Z-scores was greater in the intervention group than in the control group and resulted in zero prevalence for the three types of malnutrition at the end of the experimental period.

According to Nikiema *et al*. (2009), in Burkina Faso, natural substances are also recommended by traditional health practitioners for immunological and nutritional recovery, early treatment of HIV infection and reducing the side effects of ARV (antiretroviral) treatment. The most important of these are the leaves of *Moringa oleifera* Lam. (Moringaceae), the pulp of the fruit of *Detarium microcarpum* Guill. & Perr. (Fabaceae), spirulina and pollen from the beehive.

TETE-BENISSAN *et al*. (2012) evaluated the influence of leaf powder consumption on serum protein changes during nutritional recovery in malnourished subjects. They reached the following conclusions: Infants (29 HIV-negative and 26 HIV-positive) and children (27 HIV-negative and 32 HIV-positive) of both sexes aged between 12 months and 8 years were compared. After 16 weeks of *M. oleifera* use, anthropometric parameters were measured, and assays of total protein, creatinine, ASAT, ALAT and GT were performed, along with a proteinogram. Nutritional recovery with *M. oleifera* showed that BMI increased significantly in both HIV-negative and HIV-positive subjects ($p<0.001$). The significant increase in albumin concentrations correlated with a significant decrease in total protein, α1, α2, β, γ, globulin fractions, creatinine, AST, ALT and GT after use of the dietary supplement. The results of the study also showed that the improvement in nutritional status, inflammatory status and immune status was greater in HIV-negative subjects than in HIV-positive subjects. This study confirms the nutritional qualities and pharmacological properties of *M. oleifera* leaves in the fight against malnutrition and micronutrient deficiencies. Thus, despite the profound metabolic disruption caused by viral infection, *M. oleifera* effectively helps to reduce the inflammatory state in HIV-positive subjects.

Moringa oil also contains around 76% linolenic acid and oleic acid, making it a potential substitute for olive oil. *Moringa* leaves contain an exceptionally high amount of protein compared with other leaves consumed as food, and essential amino acids such as lysine, tryptophan, phenylalanine, valine, etc. (Trigo *et al*., 2021).

The *Moringa* tree has been reported to have high economic and cultural values, which has also led to the emergence of *Moringa* plantation and processing businesses with its implication in job creation and therefore poverty reduction. Many families, particularly women, are involved in the distribution and sale of fresh *Moringa* leaves. They make a living from supplying urban centers on a daily basis (Omotesho *et al*., 2013).

In Nigeria, the average yield of wet leaves per *Moringa* plant is 4.5 kg per year, equivalent to 1 kg of dry leaf powder, giving a ratio of 4.3 kg to 1 kg of dry organic leaf powder. On average, one hectare of *Moringa* plant will yield 50,616 kg of dry leaf powder and a gross income of $75,924 per year. It is important to note that the *Moringa* plant produces for seven years or more (Omotesho *et al*., 2013).

Moringa leaves contain antinutritional factors such as oxalate and phytate and tannins that can reduce the bioavailability of certain nutrients. Treatments such as roasting (Alidou *et al.*, 2016) and boiling (Sallau *et al*., 2012) have been reported to effectively reduce the content of these anti-nutrients, thereby increasing nutrient bioavailability. Boiling leaves before consumption is a traditional practice of local communities in Zaria, Nigeria.

Moringa leaves are rich in polyphenols, the main components of which are flavonoids and phenolic acids. The flavonoids found are mainly quercetin and kaempferol, while the phenolic acids are mainly gallic, chlorogenic, ellagic and ferulic acids. The leaves also contain saponins, tannins, catecholic tannins, anthraquinones and alkaloids (Omede, 2016). *Moringa* has remarkable health benefits, including antioxidant, antimicrobial, anticancer, anti-inflammatory and anti-diabetic activity (Trigo *et al*., 2021; Ghimire *et al*., 2021; Kashyap *et al*., 2022). There is also growing interest in using *Moringa* as a value-added ingredient in the development of functional foods (Kashyap *et al*., 2022).

V. Conclusion

At the end of this study, a number of physico-chemical parameters were determined. The study revealed that *Moringa oleifera* leaf powder with small leaves, Morphotype 2 is rich in protein, calcium, magnesium, iron, zinc and β-carotene. Dried large-leaf *Moringa oleifera*, Morphotype 1 leaf powder is low in protein and very low in lipids. Its ash content is almost

the same as that of the small leaves. From a nutritional point of view, large-leaf *Moringa oleifera*, Morphotype 1 is not very suitable for treating cases of protein and lipid deficiency.

The processing of *Moringa* leaves into powder remains a good practice for better preservation of the product but also for a good concentration of nutrients. Analysis of the chemical composition revealed the particularities of dried *Moringa oleifera* leaf powder with small leaves, which would be of great interest from a nutritional point of view.

References

1. *Alidou C, Salifou A, Djossou J, Mazou M, Tchobo FP, Soumanou MM (2016).* Roasting effect on anti-nutritional factors of the *Moringa oleifera* leaves. *Int. J. of Adv. Res.* 4, 78-85.
2. *Anwar F, Latif S, Ashraf M and Gilani AH. (2007). Moringa oleifera*: a food plant with multiple medicinal uses. *Phytotherapy Research 21*(1) : 17-25.
3. *AOAC, "Official Methods of Analysis*," 15th Edition, Association of Official Analytical Chemists, Washington DC, 1990, pp. 808,831-835, 1113.
4. *Barnabas K., Cheikna Z., Raketa W. C., Aly S., Brahim B. O., Alfred S. T., 2013.* Study of the nutritional value and hygienic quality of local infant flours from Chad, with the aim of their use for improved infant flours preparation. *Food and Nutrition Sciences*, 2013, 4, 59-68. http://dx.doi.org/10.4236/fns.2013.49A2009 Published Online September 2013 (http://www.scirp.org/journal/fns).
5. *Barnabas K., Djimadoum K., Brahim B.O., Emilienne S., Alfred S.T., 2024.* Assessment of Biological Effectiveness of Infant Flours on the Iron Status and Speed of Recovery of MAM Children Admitted to HNDA Hospital at N'Djamena (Chad). *Central African Journal of Public Health*, Vol. 10, N°6, pp. 285-296.
6. *Bidossessi VSH, Sam F. B, Serge BML, Romaric O, Alfred A, Kou'Santa SE. AMOUZOU et HOUNMENOU, 2013.* Amélioration de l'état nutritionnel des enfants âgés de 6 à 30 mois à Lissèzoun (Centre-Bénin) par la poudre de feuilles de *Moringa oleifera*(Lam.). *Int. J. Biol. Chem. Sci*. 7(1): 225-235, February 2013
7. *Compaoré WR, Nikièma PA, Savadogo A, Bassole HIN, Mouecoucou J, Pignatelli S, Simporé J and Traoré SA. (2011).* Nutritional and Hematological Recovery of Severely Malnourished Children with New Flour Formulas Developed at Ouagadougou (Burkina Faso). *British Journal of Dairy Sciences* 2 (1): 11-17, 2011.
8. *Hounhouigan D. J. and Traoré S. A., 2011.* Chemical Composition and Antioxidative Properties of Seeds of *Moringa oleifera* and Pulps of *Parkiabiglobosa* and *Adansoniadigitata* Commonly used in Food Fortification in Burkina Faso. *Current Research Journal of Biological Sciences* 3(1): 64-72, 2011
9. *De Jong W., Campbell B. M. & Schroder, J-M., 2000.* "Sustanining incomes from non timber forest products: introduction and and synthesis". *International Tree Crops Journal,* 10 (4): 427-275.
10. *Foidl, N., Harinder, P. S. & Becker K, 2001.* Potentiel du *Moringa oleifera* pour les besoins agricoles et industriels*in* L'arbre de la vie, Les multiples usages du *Moringa*. CTA etCTA et CWS, Dakar, 45-78 p.
11. *Fox J. D. and Robyt J. F., 1991.* "Miniaturization of Three Car- bohydrates Analyzes Using a Microplate Reader," *Analytical Biochemistry*, Vol. 195, No. 1, 1991, pp. 93-96. doi:10.1016/0003-2697(91)90300-I
12. *Ghimire S, Subedi L, Acharya N, Gaire BP. (2021). Moringa oleifera*: A Tree of Life as a Promising Medicinal Plant for Neurodegenerative Diseases. *J. Agric. Food Chem*. 69, 14358-14371 doi: 10.1021/acs.jafc.1c04581
13. *Nikiéma J. B., K. Djierro, J. Simpore, D. Sia, S. Sourabié, C. Gnoula et I.P. Guissou, 2009.* Stratégie d'utilisation des substances naturelles dans la prise en charge despersonnes vivant avec le VIH: expériencedu Burkina Faso. *Ethnopharmacologia*, n°43, juillet 2009. Dossier spécial: Médecine traditionnelle en Afrique.
14. *Kashyap P, Kumar S, Riar CS, Jindal N, Baniwal P, Guine RF, Correia PMR, Mehra R, Kumar H. (2022).* Recent Advances in Drumstick (*Moringa oleifera*) Leaves Bioactive Compounds: Composition, Health Benefits, Bioaccessibility, and Dietary Applications. *Antioxidants (Basel)*, 11, 402, doi: 10.3390/antiox11020402
15. *Manzo ML, Halidou DM, Hallarou M, Illo A, Rabani A, Donnen P and M Dramaix, 2016.* Composition de la poudre des feuilles sèches de *Moringa oleifera* dans trois régions du Niger. *Afric. J. of Food Agric. Nut. and Dev*., 2016; *16(4)*. DOI: 10.18697/ajfand.76.15115
16. *Mapongmetsem P. M. & Zedong C. H., 1997.* Situation du bois de chauffe dans les savanes humides de l'Adamaoua. *Le flamboyant*. 42: 29-33.
17. *Mapongmetsem P. M., Nkongmeneck B. A., Alexandre D., Salba I. & Haoua M., 2010.* Jardins de case et sécurité alimentaire dans les savanes soudano-guinéennes (Adamaoua-Cameroun). Nanterre, Franve, Symposium Mega-Tchad 2002. 12 p.
18. *Melom S, Mbayngone E et Mapongmetsem PM. (2016).* Caractérisation variétale de *Moringa oleifera* Lam. (Moringaceae) dans la vallée du Logone (Tchad-Cameroun). Annales de l'Université de N'Djamena Série C N°8.
19. *Ndong M, Wade S, Dossou N, Guiro AT and Gning RD. (2007).*Valeur nutritionnelle du *Moringa oleifera,* étude de la biodisponibilité du fer, effet de l'enrichissement de divers plats traditionnels sénégalais avec la poudre des feuilles. *African*

*Journal of Food, Agriculture, Nutrition and Development*7 (3): 17 pages.
20. *Ngamo L.S.T., 2004.* Rapport technique (septembre 2003-Février 2004). Store protect, projet interuniversitaire ciblé (PIC), N'Gaoundéré, Cameroun. 34 p.
21. *Omede A. (2016).* Total polyphenolic content and antioxidant properties of *Moringa oleifera* leaf extracts. *Animal Research International* 13, 2454 – 2462.
22. *Omotesho, K. F., Sola-Ojo, F. E., Fayeye, T. R., Babatunde, R. O., Otunola, G. A., &Aliyu, T. H. (2013).* The potential of Moringa tree for poverty alleviation and rural development: Review ofevidences on usage and efficacy. *International Journal of Development and Sustainability*, 2(2), 799-813.
23. *Pinta M.,* "Méthodes de Référence pour la Détermination des Éléments Minéraux dans les Végétaux. Détermination des Éléments Ca, Mg, Fe, Mn, Zn et Cu par Absorption Atomique," *Oléagineux*, Vol. 28, No. 2, 1973, pp. 87-92.
24. *Saint Sauveur A, Broin M. (2010).* Produire et transformer les feuilles de *Moringa*. Editions CTA, CDE, Horizon Gémenoéd., France, 69 pages.
25. *Sallau B, Mada SB, Ibrahim S, Ibrahim U. (2012).* Effect of boiling, simmering and blanching on the antinutritional content of *Moringa oleifera* leaves. *Int. J. Food Nutr. Saf*. 2, 1–6.
26. *Solidarités international, 2019. Moringa*: contre la malnutrition au Tchad, l'arbre de vie, 22 mai 2019.
27. *Tete–Benissana, Quashiem-La, Lawsonevik, Kokouk, Gbeassorm, 2012.* Récupération nutritionnelle chez les sujets malnutris VIH positifs et VIH négatifs après utilisation de feuilles de *Moringa oleifera*Lam. *Journal of Animal & Plant Sciences*, 2012. Vol.15, Issue 2: 2184-2199
28. *Trigo C, Castello ML, Ortol MD, Garcia-Mare FJ, Desamparados Soriano M. (2021). Moringa oleifera*: An Unknown Crop in Developed Countries with Great Potential for Industry and Adaptedto Climate Change*, Foods*, 10, 31. doi: 10.3390/foods100 10031
29. *Urbain Zongo, Steve Léonce Zoungrana, Aly Savadogo, Alfred S. Traoré,* (2013). Nutritional and Clinical Rehabilitation of Severely Malnourished Children with *Moringa oleifera* Lam. Leaf Powder in Ouagadougou (Burkina Faso). *Food and Nutrition Sciences* 4: 991-99
30. *Vincent A, Grande F, Compaore E, AmponsahAnnor G, Addy PA, Aburime LC, Ahmed D, BihLoh AM, Dahdouh Cabia S, Deflache N, Dembele FM, Dieudonne B, Edwige OB, Ene-Obong HN, Fanou Fogny N, Ferreira M, OmaghomiJemide J, Kouebou PC, Muller C, Najera Espinosa S, Ouattara F, Rittenschober D, Schonfeldt H, Stadlmayr B, van Deventer M, Razikou Yiagnigni A & Charrondiere UR. (2020).* Table de composition des aliments FAO/INFOODS pour l'Afrique de l'Ouest (2019) Guide d'utilisation & table de composition des aliments condensée. Rome, FAO.

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Effectiveness of the use of DAFS-25 in the Standard Hepatitis Treatment Regimen for Dogs

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Abstract- The article provides a study on the effectiveness of the drug DAFS-25 in the standard hepatitis treatment regimen for dogs. The study was conducted in a veterinary clinic «Alabai», Astrakhan, based on the treatment of dogs of the Caucasian wolfhound breed from Kangly kennel. Key indicators of liver status in dogs were taken in the study: alkaline phosphatase (ALP), ALT, AST, ALB (albumin), (TB) total bilirubin, (TP) total protein; in the process of treatment, based on the results of the biochemical rapid analyzer Seamaty 120VP, animals were divided into three groups (one control and two experimental groups) by analyzing their state. Fifteen dogs aged 3-6 were reviewed in the study, the average weight of animals was 65 kg. Biochemical analysis was carried out at the beginning of the study, on the twentieth day and after the end of therapy. The standard treatment regimen was used in the control group and the drug DAFS-25 was added into the standard treatment regimen of experimental groups at a dose of 1.6 mg/kg (104 mg/head) in the second group and 4.8 mg/kg (312 mg/head) in the third group.

Keywords: drug, DAFS-25, hepatitis, caucasian wolfhound, treatment regimen.

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Effectiveness of the use of DAFS-25 in the Standard Hepatitis Treatment Regimen for Dogs

Эффективность Применения Препарата Дафс-25 В Стандартной Схеме Лечения Гепатитов У Собак

Poberezhets E. P. [α] & Rodionova T. N. [σ]

Реферат- **Вданной статье предоставляется исследованиепо изучению эффективности применения препарата ДАФС-25 в стандартной схеме лечения гепатитов у собак.Исследование проводилось в ветеринарной клинике «Алабай» г. Астрахань на основе лечения собак породы кавказский волкодав питомника «Канглы». При исследовании были взяты основные показатели состояния печени у собак: щелочная фосфатаза (ALP), ALT, AST,ALB (альбумины), (TB)общий билирубин, (TP) общий белок,впроцессе лечения по результатам биохимического экспресс анализатора Seamaty 120VP, анализируя состояние животных, их распределил их на три группы – однаконтрольная и две опытные. В изучении было обследовано 15 собак, от 3 до 6лет, средний вес животных 65 кг. Биохимический анализпроводили в начале исследования, на двадцатый день и после окончания терапии. В контрольной группе применялась стандартная схема лечения, а в опытных в стандартную схему лечения был добавлен препарат ДАФС-25в дозах 1,6 мг/кг (104 мг/гол) - вторая группа и 4,8 мг/кг (312 мг/гол) - третья группа. Летальных исходов в период исследования не было. Для исследования был взят препарат ДАФС-25 так как он обладает выраженными антиоксидантными свойствами, благоприятно влияет на организм животных от негативных факторов внешней среды, восполняет недостачу селена в организме животных. Благоприятно влияет на состав крови, улучшает обменные процессы всего организма. В результате лечения общее состояниеживотных которые получали терапию пришло к физиологической норме, биохимические показатели взятие в конце терапии нормализовались, что свидетельствовало о полном выздоровлении собак. Исследования показали, эффективность применения препарата в второй и третьей опытных группах, что позволяет предложить данный препарат ДАФС-25 как альтернативу в лечении заболеваний печении и гепатитов другимгепатопротекторным препаратам.**

Ключевые слова: препарат, ДАФС -25, гепатит, кавказский волкодав, схема лечения.

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Abstract- The article provides a study on the effectiveness of the drug DAFS-25 in the standard hepatitis treatment regimen for dogs. The study was conducted in a veterinary clinic «Alabai», Astrakhan, based on the treatment of dogs of the Caucasian wolfhound breed from Kangly kennel. Key indicators of liver status in dogs were taken in the study: alkaline phosphatase (ALP), ALT, AST, ALB (albumin), (TB) total bilirubin, (TP) total protein; in the process of treatment, based on the results of the biochemical rapid analyzer Seamaty 120VP, animals were divided into three groups (one control and two experimental groups) by analyzing their state. Fifteen dogs aged 3-6 were reviewed in the study, the average weight of animals was 65 kg. Biochemical analysis was carried out at the beginning of the study, on the twentieth day and after the end of therapy. The standard treatment regimen was used in the control group and the drug DAFS-25 was added into the standard treatment regimen of experimental groups at a dose of 1.6 mg/kg (104 mg/head) in the second group and 4.8 mg/kg (312 mg/head) in the third group. There were no lethal outcomes during the study period. The drug DAFS-25 was taken for the research, as it has strong antioxidant properties, positively affects the animals' body from negative environmental factors, fills selenium deficiency in the body of animals. It positively affects the composition of the blood, improves metabolic processes of the whole organism. As a result of treatment, the general condition of the animals who received therapy came to the physiological norm, biochemical parameters taken at the end of therapy returned to normal, which indicated a complete recovery of the dogs. Studies have shown the efficacy of the drug in the second and third experimental groups, which allows to suggest the drug DAFS-25 as an alternative to other hepatoprotective drugs in the treatment of liver diseases and hepatitis.

Keywords: drug, DAFS-25, hepatitis, caucasian wolfhound, treatment regimen.

I. Введение/Introduction

В последнее время в ветеринарной практике у собак встречаются очень часто болезни печени. Одно из самых распространенных заболеваний печени является гепатит. Гепатит –это воспалительные заболевания печени, в результате чего орган не выполняет свои основные функции (вывод токсинов из организма, обмен веществ, усвоение витаминов и микроэлементов), и это приводит к ослаблению организма, нарушению работы других органов и систем, интоксикации. Причины возникновения гепатитов у собак

различен. Алиментарный гепатит является одним из часто встречающихся заболеваний в ветеринарной практике. Возникновение заболевания напрямую зависит от нерационального питания, которое приводит к нарушению функционального состояния печени, обмена веществ и в целом на организм животного. Процент смертельных исходов составляет 30-40%.[1] В результате разнообразия патоморфологических изменений при гепатите у собак как правило отмечают пат изменения в желчном пузыре и печени, а так же желтушность слизистых[1].

I. Introduction

Recently in veterinary practice, liver diseases are common in dogs. Hepatitis is one of the most common liver diseases. Hepatitis is an inflammatory liver disease as a result of which the organ does not perform its basic functions (removal of toxins from the body, metabolism, assimilation of vitamins and trace elements) and this leads to a general weakening of the body, violations in the work of other organs and systems, intoxication. The causes of hepatitis in dogs are different. Nutritional hepatitis is one of the most common diseases in veterinary practice. The occurrence of the disease directly depends on malnutrition, which leads to a violation of the functional state of liver, metabolism and generally the whole organism of an animal. The percentage of deaths is 30-40%. As a result of the diversity of pathomorphological changes with hepatitis in dogs pathological changes in the gall bladder and liver, as well as yellowing of mucous membranes are usually noted.

II. Материалы и Методы Исследования/Materials and Methods of Research

Исследования проводились с апреля по май 2023 года, в рамках ветеринарной клиники «Алабай» и питомника кавказских волкодавов «Канглы» в г. Астрахань.В результате работы было сформировано три группы по пять собак в каждой группе, в возрасте от 3 до 6 лет, весом 65кг. Всего в работе было обследовано 15 собак.Распределение больных животных по группам имело случайный характер. Группы были выделены на основании схем лечения. Первая (контрольная)группа животных получали лечение по стандартной схеме, которая включала препараты 5%раствор глюкозы 8мл/кг, гептрал 400мг на гол, мильгамма 2мл на гол ,0,9% растворNaCl 10мг/кг. Вторая(опытная)группа так же получала стандартное лечение, но в схему был добавленселеноорганический препарат ДАФС-25 в дозе 1,6 мг/кг (104мг/гол). Третья группа (опытная) гдеживотные получали лечение по той же схеме, что и вторая с добавлением селеноорганическогопрепарата ДАФС-25 в дозе 4,8 мг/кг (312 мг/гол).

III. Результаты Исследований/Research Results

На момент исследования у собак отмечались четко выраженные клинические признаки гепатита, температура тела повышалась до 40 градусов, при осмотре было выявлено бледность слизистых оболочек ротовой полости, десен и склеры глаз, у некоторых животных отмечалась незначительная желтушность, желудочно-кишечный тракт нарушен (понос, а у некоторых животных кал содержал непереваренную пищу), снижение аппетита, угнетение общего состояния собак, периодическая рвота. При пальпации отмечалась болезненность в области печени. При УЗИ диагностике увеличение печени, края неровные, повышение эхогености.[5]
Для оценки влияния препарата ДАФС-25 производили забор крови в начале исследования, на седьмой день и в конце опытанатощак. Биохимический анализ крови проводился на экспресс анализаторе Seamaty 120VP. Для наглядности и подтверждения диагноза были взяты наиболее информативные биохимические показатели крови: щелочная фосфатаза (ALP), ALT,AST, общий билирубин (TB) , альбумины (ALB), общий белок (TP).[4].

В начале исследования после забора крови полученные показатели были усреднены и представлены в таблице1

Таблица 1: Биохимические показатели крови собак в начале исследования

Обозначения	Показатели	Норма	1 группа (контрольная группа)	2 группа опытная (ДАФС-25 в дозе 104 мг/гол)	3 группа опытная (ДАФС-25 в дозе 312 мг/гол)
ALB	Альбумины ,г/л	22-39	17±1,20*	19±1,50*	20,6±1,51*
TB	Общий билирубин, мкмоль/л	0,9-10,6	11,7±0,23*	13,4±0,25*	11,5±0,23*
TP	Общий белок, г/л	50-100	43±2,11*	46±2,08*	47±2,09*
ALP	Щелочная фосфатаза, ед/л	10,6-100,7	111,8±3,22*	115,2±3,25	110,3±3,20*
ALT	АЛТ, ед/л	8,2-57,3	67±2,24*	65,3±2,22*	68,8±2,24*
AST	АСТ, ед/л	8,9-48,5	55,3±2,12*	57,9±2,13*	58,2±2,13*

Примечание: * $p<0,05$ относительно физиологической нормы*

При исследовании крови собак больных гепатитом в начале лечения отмечается понижение альбуминов у контрольной группы на 29,41% по отношению физиологической нормы, в опытных (второй и третьей) на 15,79%-6,80%, снижение общего белка у контрольной первой группы на 16,28%, а второй и третьей опытных групп на 8,70% -6,38% от нормы. Повышение показателей АСТ и АЛТ, АСТ на 14,02% в контрольной группе, а у опытных 19,38-19,59%, АЛТ повысился на 16,93% в первой группе, второй и третьей на 13,96%-18,67%относительно физиологической нормы крови. Показатель щелочной фосфатазы крови был увеличен у первой контрольной на 11,02%, у опытных 14,20% - 9,53% по отношению нормы. Уровень общего билирубина у всех собак был повышен относительно физиологической нормы на 10,38% первая группа и на 22,64% -8,49%.

Повторное исследование крови собак больных гепатитом проводилось на двадцатый день лечения у всех групп

Таблица 2: Биохимические показатели крови собак на двадцатый день исследования

Обозначения	Показатели	1группа (контрольная)	2группа опытная (ДАФС-25в дозе 104 мг/гол)	3группа опытная (ДАФС-25 в дозе 312 мг/гол)
ALB	Альбумины, г/л	18,5±1,21	20,8±1,23*	21,7±1,24*
TB	Общий билирубин, мкмоль/л	10,9±0,11	10,7±0,10*	10,6±0,10*
TP	Общий белок, г/л	45±2,08	47±2,09*	49±2,11*
ALP	Щелочная фосфатаза, ед/л	101,3±3,21	65,3±2,22*	63,7±2,23*
ALT	АЛТ, ед/л	58,2±2,13	52,6±2,12*	51,8±2,10*
AST	АСТ, ед/л	52,4±2,10	50,7±2,08*	49,2±2,02*

*Примечание: * $p<0,05$ относительно результатов анализов первой контрольной группы*

При взятии биохимических анализов крови на двадцатый день после начала лечения было отмечено, что показатели были значительно понижены в второй и третьей группах относительно первой. Щелочная фосфатаза была ниже на 59,03%-55,85%, показатель АЛТ был снижен на 12,36%-10,65%, АСТ понизился 5,69%-2,56%, общий билирубин так же был снижен на 2,83%-1,87%. Отмечено повышение альбуминов у второй и третьей группах на 12,43%- 17,30% по отношению к контрольной первой группе. Общий белок так же повысился 4,44%-8,89% по отношению к первой группе.

Таблица 3: Биохимические показатели крови собак по окончанию исследования

Обозначения	Показатели	1 группа (контрольная)	2группа опытная (ДАФС-25 в дозе 104 мг/гол)	3группа опытная (ДАФС-25 в дозе 312 мг/гол)
ALB	Альбумины, г/л	23±1,52	25±1,53*	27±1,55*
TB	Общий билирубин, мкмоль/л	8,7±0,21	5,4±0,18*	3,5±0,20*
TP	Общий белок, г/л	51±2,15	58±2,17*	63±2,22*
ALP	Щелочная фосфатаза, ед/л	23,3±1,23	22,5±1,08*	18,4±1,20*
ALT	АЛТ, ед/л	37,8±1.43	35,5±1,40*	33,8±1,42
AST	АСТ, ед/л	24,8±1,22	21,5±1,12*	19,3±1,13*

Примечание: $p<0,05$ относительно результатов анализов первой контрольной группы*

При повторном взятии крови на биохимические показатели после лечения наблюдались достоверныеизменения в крови.Так щелочная фосфатаза у всех опытных животных снизилась до 18,5 г/л – третьей группы, второй 22,5 ед/л против 23,3 ед/л контрольной группы. Отмеченоснижение ферментов печени у собак второй и третьей групп АЛТдо 33,8 ед/л -35,5ед/л против37,8 ед/лконтрольной группы, АСТ в опытных группах снизилась до 21,5 ед/л во второй группе и до 19,3 ед/л в третьей опытной группе против 24,8 ед/л относительно первой группы. Отмечено снижение общего билирубина у собак опытных групп до 3,5 – 5,4мкмоль/л против 8,7 мкмоль/л контрольной группы. Повысились альбумины до 27 г/л – 25 г/л по отношению к 23 г/л,общий белок до 63 г/л – 58 г/л по отношению к 51 г\л первой контрольной группе.

Курс лечения у собак на момент исследования составил 45 дней. В результате чего на момент окончания лечения у собак экспериментальных групп (контрольной группы) и (в схемах включающих стандартное лечение и ДАФС-25 в дозах 1,6мг/кг (104 мг/гол) и 4,8мг/кг(312 мг/гол)) улучшилось общее состояние животных, аппетит нормализовался, отсутствовала рвота, масса тела пришла в норму, температура тела отсутствовала, что свидетельствовало об активизации обменных процессов в печени. Возобновилась работа желудочно-кишечного тракта, видимые слизистые ротовой полости и склеры глаз были розового цвета. В результате пальпации отсутствовала болезненность в области печени.

IV. Выводы/Conclusions

Прииссследовании использование различных схемлечения показало, что стандартные схемы лечения с добавлением препарата ДАФС-25 обладают более эффективным влиянием на печень. Препарат ДАФС-25 обладает сильными антиоксидантными свойствами и выраженным гепатопротекторным действием при гепатите у собак, о чем свидетельствуют данные исследованийбиохимических показателей и общего состояния животный на момент исследования.

Effectiveness of the use of DAFS-25 in the standard hepatitis treatment regimen for dogs

Список Источников

1. Булудов К.В., Бытова К.С., Саншокова М.К. Изучение влияния селенорганического препарата ДАФС-25 на регенерацию клеток эпителия кожи белых беспородных мышей // Bulletin of Medical Internet Conferences. – 2014. Vol.4.
2. Булудов К.В., Бытова К.С., Саншокова М.К. Изучение влияния селенорганического препарата ДАФС-25 на регенерацию клеток эпителия кожи белых беспородных мышей // Bulletin of Medical Internet Conferences. – 2014. Vol.4.
3. Вахрушева Т.И. Патоморфологические изменения при инфекционном гепатите у собак // Вестник КрасГАУ. 2015. №2. URL: https://cyberleninka.ru/article/n/patomorfologicheski

e-izmeneniya-pri-infektsionnom-gepatite-u-sobak (дата обращения: 27.08.2023).
4. Концевова А.А., Леонтьев Л.Б., Семак А.Э. Диагностика алиментарного гепатита собак с помощью биологически активных точек // Ученые записки КГАВМ им. Н.Э. Баумана. 2016. №1. URL: https://cyberleninka.ru/article/n/diagnostika-alimentarnogo-gepatita-sobak-s-pomoschyu-biologicheski-aktivnyh-tochek (дата обращения: 24.10.2023).
5. Куевда Е.Н., Куевда Н.Н. Этиология, диагностика и лечение гепатоза собак // Известия сельскохозяйственной науки Тавриды. 2015. №3 (166). URL: https://cyberleninka.ru/article/n/etiologiya-diagnostika-i-lechenie-gepatoza-sobak (дата обращения: 30.08.2023).
6. Соболев В.А., Кузьминова Е.В., Семененко М.П., Меньшенин В.В. Гепатотропная терапия при лекарственно-индуцированном поражении печени у животных // Сборник научных трудов СКНИИЖ. 2018. №1. URL: https://cyberleninka.ru/article/n/gepatotropnaya-terapiya-pri-lekarstvenno-indutsirovannom-porazhenii-pecheni-u-zhivotnyh (дата обращения: 30.08.2023).

References Références Referencias

1. Buludov K.V., Bytova K.S., Sanshokova M.K. Study of the effect of the selenium-organic drug DAFS-25 on the regeneration of skin epithelial cells of white mongrel mice // Bulletin of Medical Internet Conferences. – 2014. Vol.4.
2. Buludov K.V., Bytova K.S., Sanshokova M.K. Studying the effect of the selenium-organic drug DAFS-25 on the regeneration of skin epithelial cells of white mongrel mice // Bulletin of Medical Internet Conferences. – 2014. Vol.4.
3. Vakhrusheva T.I. Pathomorphological changes in infectious hepatitis in dogs // Bulletin of KrasGAU. 2015. No. 2. URL: https://cyberleninka.ru/article/n/patomorfologicheskie-izmeneniya-pri-infektsionnom-gepatite-u-sobak (accessed: 08/27/2023).
4. Kontsevova A.A., Leontiev L.B., Semak A.E. Diagnostics of alimentary hepatitis of dogs with the help of biologically active points // Scientific notes of the Bauman KGAVM. 2016. No. 1. URL: https://cyberleninka.ru/article/n/diagnostika-alimentarnogo-gepatita-sobak-s-pomoschyu-biologicheski-aktivnyh-tochek (accessed: 10/24/2023).
5. Kuevda E.N., Kuevda N.N. Etiology, diagnosis and treatment of hepatosis of dogs // Izvestia of agricultural science of Tavrida. 2015. No.3 (166). URL: https://cyberleninka.ru/article/n/etiologiya-diagnostika-i-lechenie-gepatoza-sobak (accessed: 30.08.2023).
6. Sobolev V.A., Kuzminova E.V., Semenenko M.P., Menshenin V.V. Hepatotropic therapy in drug-induced liver damage in animals // Collection of scientific papers of the Russian Academy of Medical Sciences. 2018. No. 1. URL: https://cyberleninka.ru/article/n/gepatotropnaya-terapiya-pri-lekarstvenno-indutsirovannom-porazhenii-pecheni-u-zhivotnyh (accessed: 30.08. 2023).

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Diphylla ecaudata Spix, 1823 in the Caatinga-Cerrado Ecotone: From Feeding Plasticity to Rabies Propagation in Northeastern Brazil

By Marcelo Cardoso da Silva Ventura, Randyson da Silva Pinheiro, Marcos Vinicius Costa Santos, Beatriz da Silva Borges, Rômulo Oliveira Barros, Michael Anderson Teneu Costa, Mayky Carvalho de Oliveira, Elba Regina Sampaio de Lemos & Marco Aurélio Pereira Horta

Resume- In the Brazilian Northeast, the state of Piauí exhibits gaps in bat species diversity, with limited knowledge about their ecology and zoonotic disease transmission. This study updated the distribution of *Diphylla ecaudata* in the region, exploring feeding behaviors and recording the presence of the rabies virus. Fieldwork in Picos, Pedro II, and Milton Brandão resulted in the capture of nine bats, following ethical protocols. Previous records from 2004 to 2008 were also noted. Research showed these bats' adaptability to various environments, including the Peruvian biome, and their diet flexibility beyond birds, their typical prey.

Keywords: *Brazil, ecotone, bats, piauí, one health.*

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Marcelo Cardoso da Silva Ventura [α], Randyson da Silva Pinheiro [σ], Marcos Vinicius Costa Santos [ρ], Beatriz da Silva Borges [ω], Rômulo Oliveira Barros [¥], Michael Anderson Teneu Costa [§], Mayky Carvalho de Oliveira [χ], Elba Regina Sampaio de Lemos [ν] & Marco Aurélio Pereira Horta [Θ]

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Keywords: Brazil, ecotone, bats, piauí, one health.

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I. Introduction

Knowledge about the chiropteran fauna in the state of Piauí is characterized by substantial gaps, despite significant advancements in the field of study in the Brazilian Northeast over the past two decades. Understanding the distribution of bats in the state is crucial for species conservation and habitat maintenance. In particular, focusing on the subfamily Desmodontinae, which includes only three monotypic genera (*Desmodus*, *Diphylla*, and *Diaemus*), highlights their important role in maintaining rabies in natural environments, an infection that affects the nervous system of mammals, including humans (Barreto et al. 2019).

Among hematophagous bats, the genus *Diphylla* stands out as a monotypic taxon, characterized by the absence of callosities on their anterior appendicular limbs. The epithet "hairy-legged bat" refers to the rudimentary femoral membrane covered in hair, which is a vestige of a lateral uropatagium (Vizotto and Taddei, 1973). The species *Diphylla ecaudata* (Spix, 1823), which means "tailless hairy leaf," ranks second in geographical distribution and capture frequency among blood-feeding bats, following Desmodus rotundus.

According to Uieda (1982), *Diphylla ecaudata* specializes in feeding on birds. however, Ruschi (1951) notes that in the absence of their usual prey, they may also attack pigs, cattle, and horses. This specialized diet makes hematophagous bats significant players in the spread of diseases such as rabies, a viral encephalitis with nearly 100% lethality in both animals and humans worldwide (Streicker and Allgeier, 2016).

The association between *D. ecaudata* and the rabies virus is noteworthy, as these viruses primarily

affect mammals, even though these bats mostly prey on birds. This interaction can be explained by their shared habitats, particularly in caves with *Desmodus rotundus*, the primary reservoirs of the rabies virus variant AgV3, facilitating the exchange of viral particles (Albas et al. 2011). Since caves are also inhabited by non-hematophagous bats, positive findings for rabies extend to these species as well.

Updating the numbers for Brazil, there are records of seven variants of the *Lyssavirus* genus. Among these are variant 2 (AgV2), found in *Phyllostomus discolor* (Albas et al. 2011), and variants 4 and 6 (AgV4 and AgV6), found in the insectivorous bats *Tadarida brasiliensis* and *Lasiurus cinereus*, respectively (Brasil, 2023).

Regarding distribution, *D. ecaudata* has been recorded throughout much of the national territory, being present in all regions, with notable occurrences in the Southeast and Northeast of Brazil (Rocha et al., 2014). In the state of Piauí, Castilho et al. (2010) made the first record of *D. ecaudata* in the municipalities of São Miguel do Tapuio and Buriti dos Montes based on field research conducted in 2004. It was not until 2008 that Gregorin, Carmignotto, and Percequillo described its occurrence in the Serra das Confusões National Park (PNSC) in Gilbués, Piauí.

Understanding the distribution and ecology of *Diphylla ecaudata* not only addresses the gaps in knowledge about this species but also enhances our understanding of the broader chiropteran fauna in Piauí. This study aimed to update the geographical distribution of *Diphylla ecaudata* in the Brazilian Northeast, associating it with new foraging approaches and records of rabies virus occurrence in the region for this species. By highlighting these findings, the research contributes to ongoing conservation efforts and public health policies in the region, which aim to mitigate the risks associated with zoonotic diseases and promote biodiversity preservation.

II. Metodology

a) Research Area

Located between 2° 44' 49" and 10° 55' 05" latitude South and 40° 22' 12" and 45° 59' 42" longitude West, the state of Piauí is bordered by the states of Ceará and Pernambuco to the east, Bahia to the south and southeast, Tocantins to the southwest, with the Parnaíba River marking the border with Maranhão to the west, and the Atlantic Ocean to the north (Lima et al., 2020). It occupies 251,755.481 km², which is 16.16% of the 1,558,000 km² of the Northeast region of Brazil. Piauí is the third-largest state in the Northeast, smaller only than Bahia and Maranhão, and the tenth-largest state in Brazil, accounting for 2.9% of the national territory (IBGE, 2022).

Piauí contains a wide variety of ecosystems, including stretches of the Cerrado and Caatinga biomes, which are known for their biodiversity and varying climatic conditions (Santos-filho*et al.*, 2018). These biomes, along with a significant number of cave systems and fragmented forest patches, provide ideal habitats for bat species (Pereira, 2022). The state's mosaic of natural environments, particularly cave habitats, supports both hematophagous and insectivorous bat populations. These bats play critical roles in ecosystem services such as pollination and seed dispersal but are also key reservoirs for zoonotic diseases, including rabies (Stoner-Duncan *et al.,* 2014).

The choice of Piauí for this study was motivated by these unique ecological features and its role as a transition zone between the Cerrado and Caatinga biomes. This makes the region a hotspot for studying bat ecology and disease transmission. The presence of both preserved and disturbed habitats, including agricultural areas, increases the chances of interactions between bats and humans or livestock, which is relevant for understanding the dynamics of rabies transmission.

b) Sampling

i. Primary Data

Primary distribution data were obtained through passive sampling. Mist nets measuring three meters in height by nine and twelve meters in length were used, set up in strategic areas based on factors favorable for the flight routes of these animals and the presence of their usual prey. The traps were positioned at two collection points at 6 pm and dismantled at midnight of the following day, totaling a sampling effort of 4,968 m²h in the municipality of Picos, 864 m²h in the municipality of Pedro II, and 162 m²h in the municipality of Milton Brandão (Straube and Bianconi, 2002).

The animals were immediately removed from the mist nets upon capture and placed in pre-numbered cloth bags. The identification of the specimens was based on specialized literature cited in the work of Reis et al. (2017). The study was submitted to and approved by the System of Authorization and Information on Biodiversity (SISBio) under number 69264-7, and the Ethics Committee on Animal Use under number 002/CEUAIFPI/2021, with registration number AF78746 in the National System for the Management of Genetic Heritage and Associated Traditional Knowledge (SISGEN). The specimens were designated for the Natural History Collection of UFPI (CHNUFPI) in the municipality of Floriano-PI.

ii. Secondary Data

Data were obtained through a review of specialized bibliography and digital platforms such as the *Global Biodiversity Information Facility* (GBIF), including references characterizing the biodiversity of

chiropterans in the state of Piauí and the occurrence of *D. ecaudata* in the regional context.

Vegetation characteristics, geographic boundary information, territorial distances, and biomes for each collection site were extracted from research conducted on the website of the Brazilian Institute of Geography and Statistics (IBGE). This information was processed using QGIS software version 3.34.1 for map plotting (Figure 3).

III. Results and Discussion

The geographical distribution of bats of the species *D. ecaudata* is quite broad, with faunal individuals found throughout much of the American continent (Scheffer et al., 2015). The update of occurrence records in this study was achieved through field captures and secondary data, which indicated 13 specimens of *D. ecaudata* collected and identified in the state of Piauí up to the production of this study. These specimens originated from research focused on surveying diversity and/or studying zoonoses associated with chiropterans in Piauí. Figure 1 shows a photograph of a male specimen of *Diphylla ecaudata* captured in the northern region of the state, in the municipality of Pedro II.

Source: Authors' archive

Figure 1: Photograph of a faunal specimen of *Diphylla ecaudata*, collected in the municipality of Pedro II, Piauí

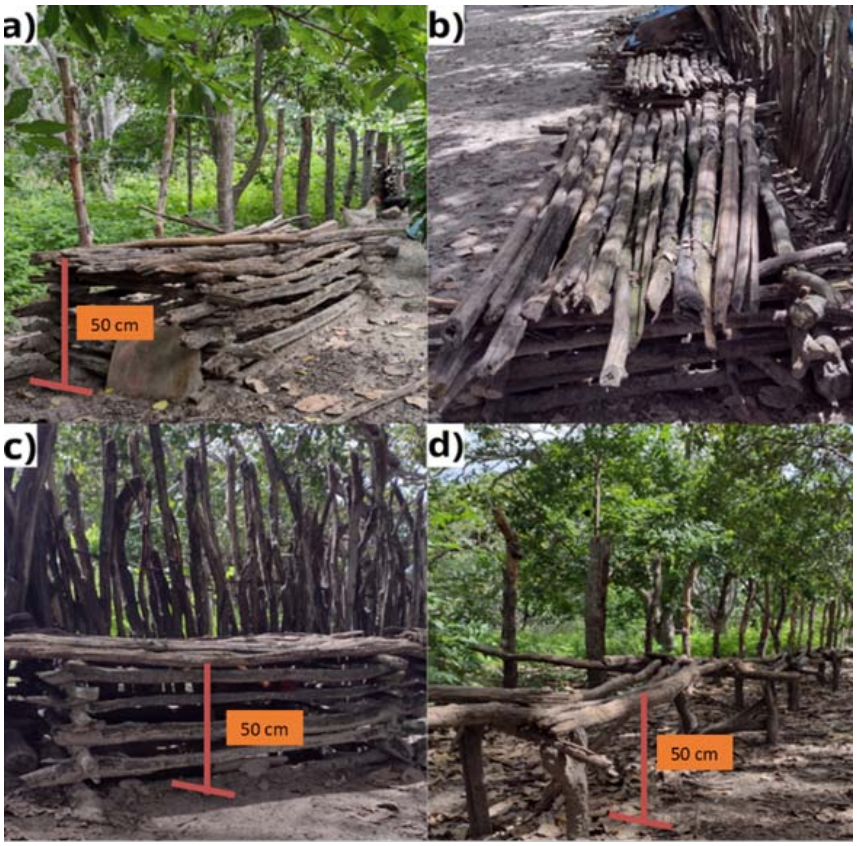
Note from Table 1 that in the village of Sertão de Dentro located in Milton Brandão – PI, five specimens were collected, and these captures were prompted by a request from a local resident who reported several chicken deaths likely caused by bats. Subsequently, we set up a mist net measuring 9 x 3 meters near the chicken roost. In Figure 2 (resting place of the chickens), we noted the height above ground level and marked it at 50 cm.

Table 1. Compilation of Information on Captures of *D. ecaudata* in the State of Piauí, Northeast Brazil (2004-2023)

Location	Source	Coordinates	Quantity
Pedro II (Serra dos Matões)	Own work	S 4°24'2,3" W 41°26'44,6"	2
Milton Brandão (Sertão de dentro)	Own work	S 4°47'03,2" W 041°28'54,2"	5
Picos	Own work	S 7°02'18,0" W 41°27'4,6"	2
Guaribas (PNSC)	Gregorin *et al.* (2008)	S 09°13'12" W 43°29'52"	1
São Miguel do Tapuio and Buriti dos Montes*	Castilho *et al.* (2010)	Not provided	3

**The record of the three animals occurred in 2004, however, the publication dates back to 2010, and we were unable to discriminate the quantity of animals for the mentioned municipalities.*

Uieda (1982), in his experimental work with specimens of *D. ecaudata*, reports these animals' preference for preying on birds within a height range of 2 to 4 meters above the ground. However, observations made by our team throughout the night in a net set up near the birds' resting place show a behavioral change, as predation occurred closer to the ground, at around 0.5 meters height, thereby expanding the spatial spectrum for predation (Figure 2). This demonstrates the flexibility in predation habits among these animals, indicating adaptations in foraging behavior.



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a) Chicken coop with dimensions of 1.5 meters in length x 0.5 meters in width and 0.5 meters in height from the ground at its highest point; b) Top view of the chicken coop; c) Front view of the chicken coop; d) Chicken roost.

Figure 2: Images of Chicken Roosts in the Backyard of a Local Resident in the Village of Sertão de Dentro, in the Municipality of Milton Brandão-PI, recorded in 2023

Figure 3 presents the map of Piauí with the occurrence of faunal individuals of the genus *Dyphylla* recorded to date. The expansion of the taxon's geographical distribution is evident from records made in PNSC (Serra das Confusões National Park) in Gilbués-PI, in 2008 by Gregorin and colleagues, and in 2010 by Castilho and colleagues in the municipalities of São Miguel do Tapuio and Buriti dos Montes, in the northern part of the state of Piauí. The update on the quantity of *D. ecaudata* was conducted by our research team.

The Parna Serra das Confusões (PNSC) is located between coordinates 9° 27' to 9° 31' S and 43° 05' to 43° 56' W, encompassing the municipalities of Canto do Buriti, Tamboril do Piauí, Jurema, Alvorada do Gurguéia, Bom Jesus, Guaribas, and Cristino Castro. The PNSC has a legal area of 823,843.08 hectares (or 8,238.43 km^2), which is approximately equivalent to 763,000 soccer fields (Brazil, 2017).

The city of Picos – PI, characterized by typical Caatinga vegetation, is located 330 km from PNSC and 249 km from the Cerrado-Caatinga enclave that includes the municipalities of Pedro II - PI and Milton Brandão - PI, further north in the state, with a distance of 35 kmbetween them. Close to these two municipalities are São Miguel do Tapuio and Buriti dos Montes, located in an interbiome area, with a distance of 54 km between them.

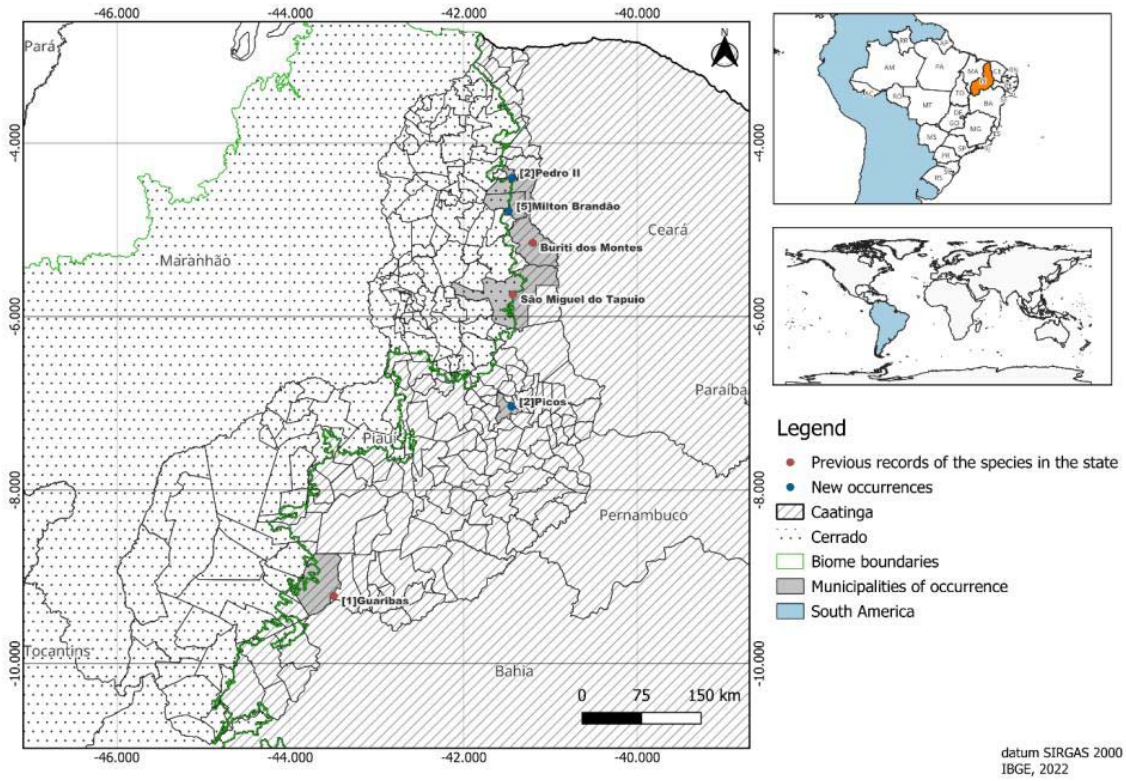

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Figure 3: Map showing the occurrence of *D. ecaudata* in the state of Piauí, delineated by municipality and biomes, spanning from 2008 to 2023

Given its geographical position, the Cerrado and Caatinga biomes dominate the state of Piauí, with a significant presence of a Cerrado-Caatinga enclave, identified as a green line on the map (Figure 3), which can be characterized as a typical transition zone according to the latest update by IBGE (2019). It is highlighted that the updates for *Diphylla ecaudata* recorded in this study were conducted in areas delimited by the following domains: Caatinga (Picos - PI) and the Cerrado-Caatinga enclave (Pedro II - PI, Milton Brandão - PI, São Miguel do Tapuio-PI, Buriti dos Montes-PI, and PNSC - PI) (IBGE, 2024).

Studying the vegetation of different biomes, especially in transition areas, leads to a classification of domains that is still subject to change. In this regard, considering the municipalities studied, all exhibit characteristics of Savanna-Woodland, with highly branchedbranching generally provided with thorns. However, Guaribas - PI and Milton Brandão - PI also have patches of Deciduous Mountain Seasonal Forest and Shrub Savanna-Woodland, respectively, which designate these two biomes as dominant in the state of Piauí. It is also noted that the focus of occurrences was in zones with a semi-arid tropical climate, with an average temperature above 18°C and a maximum of 39°C (Brazil, 2024).

Understanding the ecosystem types allows for a more informed analysis of the biology of this bat group. In this context, the Caatinga, confined to northeastern Brazil, is the least studied biome, with only about 2% of its entire territory protected by conservation units. Unsustainable use of its resources has led to extensive environmental alteration and degradation, resulting in rapid loss of species diversity, elimination of unique species, key ecological processes, and desertification (Leal; Tabarelli; Silva, 2003).

The hairy-legged vampire bat is often associated with tropical zones in its distribution, being classified as the most specialized among hematophagous bats in feeding behavior, both in natural environments and in captivity (Uieda, 1992; Uieda, 1994). Conversely, Ito, Bernard, and Torres (2016) highlight the flexibility in the feeding habits of these bats due to the scarcity of usual prey, with regular records of feeding on human blood based on molecular analysis of *D. ecaudata* feces.

The report of the AgV3 variant in *D. ecaudata* by Castilho et al. (2010) in northern Piauí adds important information to be considered by competent health authorities. It indicates evidence of rabies virus circulation in a group of animals that are poorly sampled in the region, within an area recognized for underreporting or even lack of information. This complicates the establishment of an epidemiological framework regarding rabies transmission cycles,

particularly focusing on the sylvatic aerial cycle for this disease.

IV. Final Considerations

The alert has been given! The information presented in this study brings new information regarding the behavior of *D. ecaudata* bats preying on birds close to the ground, different from what was experimentally portrayed, when *D. ecaudata* was observed preferring to prey on birds perched in higher roosts. In addition, it shows that these bats can attack different prey, such as mammals, including humans in search of maintaining their blood-eating diet.

The data point to the need for systematic, continuous and cooperative surveillance between researchers and bodies responsible for health and environmental surveillance agencies in order to converge proposals for improving and optimizing monitoring for this animal group with the aim of maintaining harmony and rapid response in cases of positivity of pathogens disseminated by this faunal group.

We understand that only joint efforts can act effectively to understand the epidemiological cycles provided by bats and their harbored microbiota. And may this essay serve as a guiding focus for further research in similar ecotonal areas and other biomes where this species of bat occurs. Establishing a working network based on the research model proposed here can be a positive factor in uncovering knowledge gaps about the spatial distribution of this taxon and keeping us connected regarding its biology amid current and future climate changes.

References Références Referencias

1. Albas, A., Campos, A.C.A., Araujo, D.B., Rodrigues, CS., Sodré, M.M., Durigon, E.L. and Favoretto, S.R., 2011. Molecular characterization of rabies virus isolated from nonhaematophagous bats in Brazil. *Revista da Sociedade Brasileira deMedicina Tropical,* [S.L.], vol. 44, no. 6, pp. 678-683. http://dx.doi.org/10.1590/s0037-86822011000600006-06.
2. Barreto, F.M., Rosa, W.L.G.A., Batista Filho, D.M. and Sousa, B.B*., 2019, Raiva dos herbívoros no Piauí: uma retrospectiva até os dias atuais. 1nd ed. 100 p.*
3. Brasil, 2017 [Viewed 14 March 2024]. Mapeamento E Análise Espectro-Temporal das Unidades De Conservação de Proteção Integral Da Administração Federal no Bioma Caatinga Parque Nacional Serra das Confusões. *Available from:* https://www.gov.br/fundaj/pt-br/composicao-/dipes-1/grupos-de-pesquisa-fundaj-cnpq/nucleos-ecentros /centro-integrado-de-estudos-georreferenciados-cieg/atlas-das-caatingas/copy_of_cap9_parna_serradas_confusoes_caatinga_fjn.pdf
4. Brasil, 2023[viewed 25 february 2024]. Ministério da Agricultura, Pecuária e Abastecimento. *Sistema de Informação em Saúde Animal. Available from:* https://www.gov.br/agricultura/pt-br/assuntos/sanidade-animal-e-vegetal/saude-animal/epidemiologia/portugues.
5. Castilho, J.G., Carnieli, P., Oliveira, R.N., Fahl, W.O.; Cavalcante, R., Santana, A.A., Rosa, W.L.G.A., Carrieri, M.L. and Kotait, I., 2010. A Comparative Study of Rabies Virus Isolates from Hematophagous Bats in Brazil. *Journal of Wildlife Diseases,* vol. 46, no4, pp. 1335–1339. https://doi.org/10.7589/0090-3558-46.4.1335. PMID: 20966291
6. Greenhall, A.M., Schmidt, U. and Joermann, G., 1984. *Diphylla ecaudata. Mammalian Species, no. 227, pp. 1-3, nov. https://doi.org/10.2307/3504-022.*
7. Gregorin, R., Carmignotto, A.P. and Percequillo, A.R., 2008. Quirópteros do Parque Nacional da Serra das Confusões, Piauí, nordeste do Brasil. *Chiroptera Neotropical,* vol. 14, no. 1, pp. 366-383. https://repositorio.usp.br/item/001729703.
8. Instituto Brasileiro De Geografia E Estatística - IBGE, 2023 [viewed 24 february 2024]. *Banco de Dados e Informações Ambientais – vegetação [online]. Available from: h*ttps://bdiaweb.ibge.gov.-br/#/consulta/vegetacao.
9. Instituto Brasileiro DE Geografia E Estatística – IBGE, 2022 [viewed 15 december 2023*]. Cidades – Piauí [online]. Available from:* https://www.ibge.gov.br/cidades-e-estados/pi.html.
10. ITO, F., Bernard, E. and Torres, R.A., 2016. What is for dinner? First report of human blood in the diet of the hairy-legged vampire bat Diphylla ecaudata. *Acta Chiropterologica*, vol. 18, no. 2, pp. 509-515. https://doi.org/10.3161/15081109ACC2016.18.2.017
11. Leal, I.R., Tabarelli, M., Silva, J.M.C., 2003. *Ecologia e conservação da Caatinga: uma introdução ao desafio. 1nd ed. Ed. Universitária da UFPE, 2003.*
12. Lima, M.G.de, Moraes, A.M.de, Nunes, L.A.P.L. and Andrade Júnior, A.S., 2020. *Climas do estado do Piauí e suas relações com a conservação do solo. Embrapa.* 144 p.
13. Pereira, Jennifer de Sousa Barros. Seleção e uso de cavernas por morcegos e suas implicações para classificação de relevância destes ambientes. 2022. Tese (Doutorado em Biologia Animal) – Universidade Federal de Pernambuco, Recife, 2022.
14. Plataforma Digital Única Del Estado Peruano, 2019 [viewed 8 march 2024]. *Reserva Comunal Amarakaeri. Available from:* https://www.gob.pe/institucion/sernanp/informes-publicaciones/-1928785-reserva-comunal-amarakaeri
15. QGIS Development Team, 2024. QGIS versão 3.34.1. Geographic Information System User Guide. Open Source Geospatial Foundation Project.

Available from: http://download.osgeo.org/qgis/-doc/manual/
16. Reis, N.R.dos, Fregonezi, M.N., Peracchi, A.L. and SHIBATTA, O.A. 2013 *Morcegos do Brasil: guia de campo. 1nd ed. Technical Books. 416 p.*
17. Rocha P.A., Pedroso, M.A., Feijó, A., Filho, N.G., Campos, B.A.T.P. and Ferrari, S.F., 2014. Update on the distribution of Diphylla ecaudata Spix, 1823 (Mammalia, Chiroptera): new records from the Brazilian northeast. *Check List,* vol. 10, no. 6, pp. 1541-1545. https://doi.org/10.15560/10.6.-1541.
18. RUSCHI, A, 1951. *Morcegos do Estado do Espírito Santo: Descrição de Diphylla ecaudata Spix e algumas observações a seu respeito. Boletim do Museu de Biologia Prof. Mello Leitão, vol. 3, pp. 1-6.*
19. Santos-Filho, Francisco Soares; SOUSA, Suzianne Raquel Valadares Sales. [IN] CI (PI) ÊNCIA: PANORAMA GERAL DOS ESTUDOS SOBRE BIODIVERSIDADE NO PIAUÍ. Revista Equador, v. 7, n. 2, p. 17-41, 2018.
20. Scheffer, K.C., DE Barros, R.F., Iamamoto, K., Mori, E., Asano, K.M., Achkar, S.M., Estevez Garcia, A.I., LIMA, J.Y.O. and FAHL. W.O, 2015. Diphylla ecaudata y Diaemus youngi: biología y comportamento*. Acta zoológica mexicana,* vol. 31, no. 3, pp. 436-445. https://www.scielo.org.mx/scielo.php?pid=S0065-17372015000300009&script=sci_abstract&tlng=pt.
21. Stoner-Duncan, Benjamin; Streicker, Daniel G.; Tedeschi, Christopher M. Vampire bats and rabies: toward an ecological solution to a public health problem. PLoS neglected tropical diseases, v. 8, n. 6, p. e2867, 2014.
22. Straube, F. C.; Bianconi, G. V., 2002. Sobre a grandeza e a unidade utilizada para estimar esforço de captura com utilização de redes-de-neblina*. Chiroptera Neotropical,* vol. 8, no. 1-2, pp. 150-152. https://www.researchgate.net/profile/Gledson-Bianconi/publication/285708110_Sobre_a_grandeza_e_a_unidade_utilizada_para_estimar_esforco_de_captura_com_utilizacao_de_redes-de-neblina/links/57-62a52408aee61395bef17b/Sobre-a-grandeza-e-a-unidade-utilizada-para-estimar-esforco-de-captura-com-utilizacao-de-redes-de-neblina.pdf.
23. Streicker D.G., Allgeier J.E., 2016. Escolhas de forrageamento de morcegos vampiros em diversas paisagens: implicações potenciais alterações no uso da terra e transmissão de doenças. *J Appl Ecol*. pp. 1280-1288. https://doi.org/10.1111/1365-2664.12690. PMID: 27499553.
24. UIEDA, W. 1992. Período de atividade alimentar e tipos de presa dos morcegos hematófagos (Phyllostomidae) no Sudeste do Brasil. *Revista Brasileira de Biologia*. pp. 563–573.
25. UIEDA, W., 1982. *Aspectos do comportamento alimentar das tres especies de morcegos hematofagos (Chiroptera, phyllostomidae).* Campinas: Universidade Estadual de Campinas, Instituto de Biologia, 166 p. Dissertação de mestrado em ecologia.
26. Uieda, W., 1994. *Comportamento alimentar de morcegos hematogafos ao atacar aves, cabrinos e suinos, em condições de cativeiro*. Campinas: Universidade Estadual de Campinas, Instituto de Biologia, 182 p. Tese de doutorado em ecologia.
27. Vizotto, L.D.; Taddei, V.A. 1973. *Chave para a determinação de quirópteros brasileiros*. 72 p.

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Preferred Author Guidelines

We accept the manuscript submissions in any standard (generic) format.

We typeset manuscripts using advanced typesetting tools like Adobe In Design, CorelDraw, TeXnicCenter, and TeXStudio. We usually recommend authors submit their research using any standard format they are comfortable with, and let Global Journals do the rest.

Alternatively, you can download our basic template from https://globaljournals.org/Template

Authors should submit their complete paper/article, including text illustrations, graphics, conclusions, artwork, and tables. Authors who are not able to submit manuscript using the form above can email the manuscript department at submit@globaljournals.org or get in touch with chiefeditor@globaljournals.org if they wish to send the abstract before submission.

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Authors must ensure the information provided during the submission of a paper is authentic. Please go through the following checklist before submitting:

1. Authors must go through the complete author guideline and understand and *agree to Global Journals' ethics and code of conduct,* along with author responsibilities.
2. Authors must accept the privacy policy, terms, and conditions of Global Journals.
3. Ensure corresponding author's email address and postal address are accurate and reachable.
4. Manuscript to be submitted must include keywords, an abstract, a paper title, co-author(s') names and details (email address, name, phone number, and institution), figures and illustrations in vector format including appropriate captions, tables, including titles and footnotes, a conclusion, results, acknowledgments and references.
5. Authors should submit paper in a ZIP archive if any supplementary files are required along with the paper.
6. Proper permissions must be acquired for the use of any copyrighted material.
7. Manuscript submitted *must not have been submitted or published elsewhere* and all authors must be aware of the submission.

Declaration of Conflicts of Interest

It is required for authors to declare all financial, institutional, and personal relationships with other individuals and organizations that could influence (bias) their research.

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- Writings
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- Printed material
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2. Drafting the paper and revising it critically regarding important academic content.
3. Final approval of the version of the paper to be published.

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The corresponding author should mention the name and complete details of all co-authors during submission and in manuscript. We support addition, rearrangement, manipulation, and deletions in authors list till the early view publication of the journal. We expect that corresponding author will notify all co-authors of submission. We follow COPE guidelines for changes in authorship.

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Unless specified in the notification, the Editorial Board's decision on publication of the paper is final and cannot be appealed before making the major change in the manuscript.

Acknowledgments

Contributors to the research other than authors credited should be mentioned in Acknowledgments. The source of funding for the research can be included. Suppliers of resources may be mentioned along with their addresses.

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Preparing your Manuscript

Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.

Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11'", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.

Format Structure

It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

All manuscripts submitted to Global Journals should include:

Title

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Keywords

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, “What words would a source have to include to be truly valuable in a research paper?” Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.

Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

Preparation of Eletronic Figures for Publication

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

Tips for writing a good quality Medical Research Paper

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.

6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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