

THERAPEUTIC MANAGEMENT OF DIARRHOEA IN A SUCKLING LAMB WITH *MELIA AZEDARACH*: A NOVEL THERAPEUTIC APPROACH

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ABSTRACT

Neonatal diarrhoea is a critical concern in lambs, causing significant losses in livestock due to its high morbidity and mortality rates if untreated. This report details an uncommon case of diarrhoea in a suckling lamb that was effectively managed using *Melia azedarach* leaf extract. The results suggest potential of plant-based therapies in veterinary applications.

Keywords: Diarrhoea, suckling lamb, management, *Melia azedarach*

INTRODUCTION

Diarrhoea is a leading health challenge in neonatal lambs, often resulting in severe dehydration, malnutrition, and mortality. The aetiology of diarrhoea is multifactorial, encompassing infectious agents like bacteria, viruses, and protozoa, as well as dietary and environmental factors (Radostits *et al.*, 2007). While conventional interventions, such as antibiotics and electrolytes, are standard, the increasing costs of conventional treatments and the readiness of natural alternatives have led to growing interest in plant-based therapies (Smith & Doe, 2020). This case report explores the use of *Melia azedarach*, a readily available and cost-effective plant, as an alternative approach to treating neonatal diarrhoea in a lamb.

CASE REPORT

HISTORY AND CLINICAL SIGNS

A 3-day-old lamb from a flock of 10 in an intensive farming system at Fulatari, Maiduguri, presented with acute diarrhoea. Symptoms included watery, greenish stools with traces of blood. Initially, the lamb was maintaining a strong suckling reflex, but the lamb's condition deteriorated within 24 hours, showing signs of dehydration such as sunken eyes,

dry mucous membranes, and lethargy. Despite receiving oral electrolytes and maternal nursing, the lamb's condition worsened (Smith & Berchtold, 2014).



Figure I: A 3-day-old lamb manifesting diarrhoea

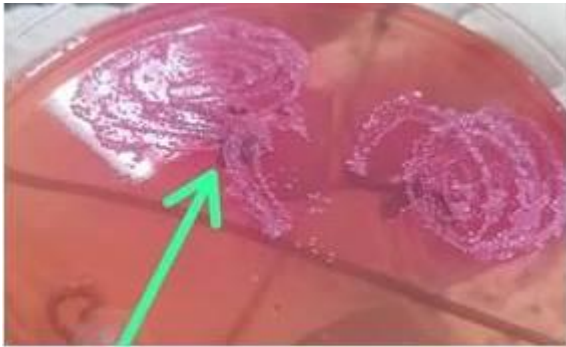


Figure II: *E. coli* colonies on MacConkey

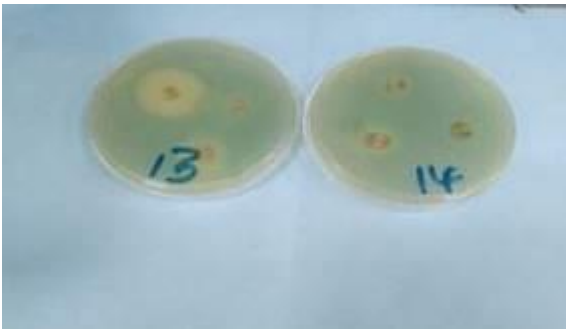


Figure III: *E. coli* inhibitory zone around *Melia azedarach*-extract



Figure IV: Leaves of *Melia azedarach*

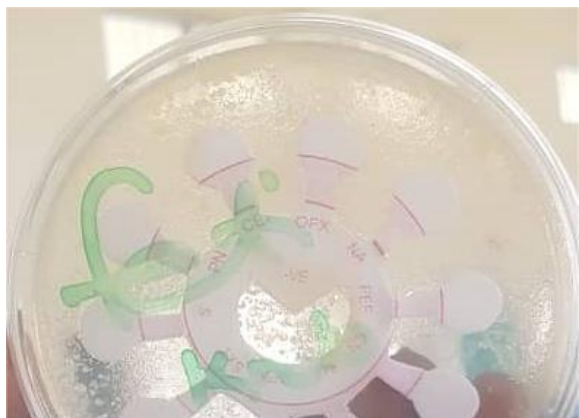


Figure V: The result of the antibiotic sensitivity showed the bacteria was resistant to the most common antibiotics including tetracycline, penicillin and ofloxacin

TABLE I: HAEMATOLOGICAL AND BIOCHEMICAL PARAMETERS OF THE SUCKLING LAMB MANIFESTING DIARRHOEA

Parameters	Reference interval (Njidda et al., 2014)	Result
PCV (%)	38.00±1.22	40.98
Hb(g/dl)	12.20±0.26	10.87
WBC(x10 ³ /µl)	4.7±0.56	6.76
RBC(x10 ⁶ /µl)	12.27	12.02
MCV(fl)	14.65±0.02	34.09
MCH(pg)	32.11±1.02	9.04
MCHC(g/dl)	45.62±2.06	26.52
Neutrophil (%)	57.00±0.33	45.05
Total protein (g/L)	62.00±1.02	68.08
Albumin (g/L)	32.6 ^a ±4.10	36.06
Globulin (g/L)	30.00±0.66	33.95

DIAGNOSIS

Bacterial culture of fecal samples from the sick lamb confirmed presence of *Escherichia coli* (Figure II), a pathogen commonly implicated in neonatal diarrhea (Radostits et al., 2007). The *E. coli* isolate exhibited resistance to multiple antibiotics (Figure V), necessitating exploration for alternative treatments. Blood tests revealed mild leukocytosis and hyperproteinemia, confirming dehydration (Table I).

TREATMENT AND MELIA AZEDARACH THERAPY

Given the lamb's rapid deterioration despite conventional treatments, an aqueous extract of *Melia azedarach*, a plant known for its antimicrobial activities (Figure III) and anti-inflammatory properties (Abba, 2024) was employed. The extract was obtained from the leaves of the plant. A dosage of 0.7 mL/kg at a concentration of 500mg/ mL of the aqueous extract was administered orally twice daily for five days. The extract was chosen due to its availability, low cost, and previously reported antimicrobial effects. Supportive measures included intravenous fluids to manage dehydration and oral electrolyte solutions to restore electrolyte balance (Smith and Berchtold, 2014). The lamb's response to the treatment was closely monitored to detect any potential side effects.

OUTCOME

Within 48 hours of administering *Melia azedarach* therapy, the lamb showed significant improvement. Diarrhoea subsided, energy levels increased, and the lamb resumed normal feeding. By the fifth day, the lamb had fully

recovered and was reintegrated into the flock. No adverse reaction to the plant extract was noticed. The flock owner was advised to closely observe the other animals for possible detection of clinical signs, early.

DISCUSSION

Application of medicinal plants in treating animal health conditions, particularly neonatal diarrhoea, has gained increasing attention (Al-Mamun *et al.*, 2018). While conventional treatments, such as antibiotics and electrolyte solutions, are commonly used, their cost and limited availability in rural areas make alternative therapies an attractive option. *Melia azedarach* was selected based on its known pharmacological properties, including antimicrobial and anti-inflammatory effects (Abba, 2024). The success of this treatment may be attributed to the bioactive compounds in *Melia azedarach*, which are believed to reduce intestinal inflammation and enhance mucosal health. Specific bioactive compounds such as flavonoids and alkaloids in the plant may contribute to its antimicrobial activity (Smith & Doe, 2020). The plant's readily availability and low cost make it an ideal alternative, especially in resource-limited settings. Furthermore, the use of *Melia azedarach* reduces reliance on conventional antibiotics, which may help mitigate the issue of antimicrobial resistance (WHO, 2005). Although supportive therapy (fluids and electrolytes) may have contributed to the lamb's recovery, the prompt improvement following the administration of *Melia azedarach* supports the efficacy of the plant extract in treating diarrhoea. However, it is essential to conduct further controlled studies to confirm the exact role of the extract in resolving the condition.

CONCLUSION

This case highlights potentials of *Melia azedarach* as a viable treatment option for neonatal diarrhoea, especially when conventional treatments are cost-prohibitive or unavailable. The lamb's recovery supports the promise of plant-based therapies in veterinary care. Future research should focus on elucidating the bioactive compounds responsible for the plant's effects, determining optimal dosing guidelines, and establishing standardized protocols for its use. Incorporating such natural treatments could enhance sustainability and reduce dependence on costly antibiotics in livestock management.

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