

In Vitro Antibacterial Activity of *Vernonia amygdalina* Methanol Extract Against Bacterial Isolates from Abattoir Meat

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INTRODUCTION & AIM

Bacterial contamination of meat, especially in abattoirs, significantly threatens food safety. Abattoirs serve as reservoirs for pathogenic and antibiotic-resistant bacteria. Contaminated meat poses risks of zoonotic transmission and foodborne infections. Increasing antibiotic resistance demands alternative antimicrobial options. This study was aimed to investigate the *in-vitro* antibacterial activity, MIC/MBC values, and phytochemical constituents of methanol extract of *Vernonia amygdalina*, contributing to the search for effective, safe, plant-based alternatives for meat preservation.



METHOD

Plant Collection: Fresh leaves of *V. amygdalina* were harvested, rinsed, air-dried (7–14 days), and pulverized.

Extraction: Exactly 100 g powdered leaves soaked in 1000 mL of methanol for 72 h; filtrate concentrated with rotary evaporator (65°C).

Bacterial Reactivation: Isolates from abattoir meat were revived in peptone water and plated on nutrient agar. Methanol extract was tested against *Bacillus sp*, *Alcaligenes faecalis1*, *Enterococcus faecium*, *Paenibacillus sp*, *Alcaligenes faecalis2*, *Lysinibacillus sp*, and *Lysinibacillus sphearicus*.

Antibacterial Assay:

- Agar well diffusion
- Broth dilution for MIC and MBC

GC–MS Analysis: Identified major phytochemicals and bioactive compounds.

This study demonstrated the potential antibacterial properties of methanol extracts of *Vernonia amygdalina* (bitter leaf) against bacterial isolates obtained from abattoir meat. The findings revealed that the extract exhibited dose-dependent antibacterial activity, with increasing zones of inhibition observed at higher extract concentrations. The extract showed varying levels of effectiveness against different bacterial isolates, indicating differential bioactivity.

Further studies, including compound isolation, toxicity assessment, and *in-vivo* testing, are recommended to fully establish its safety and efficacy for practical applications in food safety and public health. Testing the extract against a broader range of microbial species and evaluating its synergistic effects with known preservatives are essential.

Zabairu, A.Y., Muhammad, M., Saidu, I. and Ibrahim, Z. (2019) Antibacterial activity of methanolic extract of bitter leaf (*Vernonia amygdalina*) from various component fractions using column chromatography, GSC Biological and Pharmaceutical Sciences 7(2): 016–021.

RESULTS & DISCUSSION

Marked activity of 18mm and 13mm zone of inhibition were observed in *Bacillus sp*, and *Lysinibacillus sphearicus* respectively at 50mg/mL, as well as 18mm and 14mm in *Alcaligenes faecalis1* and *Alcaligenes faecalis2* respectively at the same concentration when compared to other isolates. Meanwhile, a range of 25–36mm zone of inhibition was noted for ciprofloxacin (5µg positive control). The minimum inhibitory concentration (MIC) of 25mg/mL was recorded against *Lysinibacillus sphearicus*, and 50mg/mL against *Bacillus sp*, *Alcaligenes faecalis1* and *Alcaligenes faecalis2*, while the minimum bactericidal concentration (MBC) was observed at 50mg/mL against *Lysinibacillus sp*. Gas chromatography-mass spectrometry (GC-MS) analysis revealed that *Vernonia amygdalina* possesses Heneicosane, used in control of pest infestation, with quality match (QM) of 86%. Other compounds such as pentadecane, nonanoic acid methyl ester, octacosane, pentacosane, benzenepropanoic acid, and squalene identified in the bitter-leaf extract are known to have anti-inflammatory, anticancer, antioxidant, antimicrobial, anti-hyperlipidemic, anti-tumor and hepatoprotective properties. The study revealed that the *V. Amygdalina* have bioactive compounds that can inhibit the growth of pathogenic bacteria and therefore as food preservatives.



Zone of inhibition of
positive control



Zone of inhibition of
methanol extract

CONCLUSION

FUTURE WORK / REFERENCES