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Antibacterial Activity of Phytochemicals Against Bacteria in Poultry Litter Used in Agro Ecological Farming

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Abstract

Poultry litter harbors profuse number of bacteria of which *Escherichia coli*, *Clostridium perfringens*, *Staphylococcus*, *Salmonella* Spp, and *Campylobacter* Spp are few examples. An effective technique used to add value to poultry litter used in organic agricultural production is composting. The use of poultry litter as organic fertiliser for vegetables and crops is a concern to consumers of products from such practice. It can also be used as feed for ruminant animals and in fish farming. In the light of these facts, this research was designed to determine the antibacterial effect of *Vernonia amygdalina* extract against *Salmonella* Spp, *Shigella* and *Escherichia coli* isolated from poultry litter. The extract was obtained by cold maceration of the air dried leaves of *V. amygdalina*. Four concentrations - 20 %, 40 %, 80 % and 100 % of the extract was utilised to study its antibacterial activity using the disc diffusion method and respective zone of inhibition (ZOI) against each bacterium measured. Values recorded for ZOI were subjected to one-way analysis of variance (ANOVA) using Turkey's post hoc test and significant means ($p < 0.05$) were evaluated using Minitab v.17 software.

The 20 % concentration of the extract did not inhibit the growth of any of the bacteria tested. Increase in concentration of the extract resulted in increase in the ZOI recorded against each specific bacterium. *Salmonella* Spp was significantly ($p < 0.05$) inhibited by the extract with a ZOI of 6.33 ± 0.05 (40 %); 11.00 ± 1.00 (80 %) and 13.00 ± 1.00 (100 %). Values recorded against *Shigella* Spp and *E. coli* was significantly ($p < 0.05$) high at 100 % concentration. Values recorded were 11.33 ± 0.05 (*Shigella* Spp) and 11.67 ± 1.15 (*E. coli*) respectively.

It is evident from the results obtained that the extract was effective against all three bacterium tested and can be used in composting poultry litter for use in agro ecological agriculture.

Keywords: Agro ecological farming, antibacterial activity, phytochemicals , poultry litter