

(ID 050)

**Effect of Ethanol Extracts of Plant Materials High in Polyphenol and Flavonoid on Nitrogen Loss and Nematode Count of Broiler Litter During Storage****Ahamed, M.J.I.<sup>1</sup>, Atapattu, N.S.B.M.<sup>1\*</sup>, Mannakkara A.<sup>2</sup>**<sup>1</sup>*Department of Animal Science, University of Ruhuna, Matara, Sri Lanka*<sup>2</sup>*Department of Agricultural Biology, University of Ruhuna, Matara Sri Lanka**\*[nsbm@ansci.ruh.ac.lk](mailto:nsbm@ansci.ruh.ac.lk)***Abstract**

Loss of nitrogen, mainly as ammonia from poultry litter is reported to have a range of financial, environmental and social impacts. Higher ammonia levels in poultry houses reduce the performance, welfare and carcass parameters of broilers while causing occupational health hazards to the employees. Loss of N from litter continues during composting, storage and after the field application and thus reduces its organic fertilizer value. Some plant Polyphenols and flavonoids reported to reduce the action of urease enzyme that involves in the conversion pathway of litter nitrogen into ammonia. Objective of this study was to determine the effects of ethanol extracts of five plant materials high in polyphenols and flavonoids on the nitrogen loss and nematode count of broiler litter during storage. Ethanol extracts of Betel (*Piper betle*) leaves, Ehela (*Cassia fistula*) bark, Neem (*Azadirachta indica*) leaves, Pomegranate (*Punica granatum*) leaves and spent-tea (*Camellia sinensis*) were prepared. Air-dried-ground samples of each material (200 g) were shaken with 1000 mL of ethanol for six hours and subsequently the methanol was evaporated. The crude extract of each material was then mixed with 1000 mL of distilled water. Plastic pots (n=42) were filled broiler spent litter at the rate of 1000 g/pot. Giving a completely randomize design experiment with seven replicates, pots were randomly allocated into six treatments. On day 1, seven pots were sprayed with 50 mL of tap water (control) while remaining 35 pots were sprayed with one of the five ethanol extracts at the same rate. Right after treatment application, samples were collected for the determination of pH, EC, dry matter, nitrogen (Kjeldahl method) and nematode count (Baermann funnel method). Another 50 mL of water or extracts was sprayed on day 15 of storage. Pots were stored at room temperature for 25 days. Another sample was taken from each pot on day 25 for the analysis of same parameters. Repeated measure ANOVA procedure was used to analyse the pH, EC, N% and nematode counts. Extract x time interaction was not significant for litter pH, EC, N% and nematode count. Betel leaves, Ehela bark, neem leaves and pomegranate leaves significantly increased the pH compared to water (control). Storage of litter significantly increased the pH from 7.7±0.01 to 8.0±0.02. During the 25 days of storage, the litter N percentage reduced significantly from 2.52±0.20 to 2.00±0.01. Though not statistically significant (p=0.13), the lowest percentage reduction of N was reported for the litter sprayed with tea-waste extract (30.30±4.13%) while the control reported the highest percentage N loss (36.16±5.45%). Interestingly, compared to control (82/10 g) neem extract reported significantly lower (42/10 g) nematode count. The study concluded that ethanol extracts of the tested materials at the does titrated do not reduce the loss of nitrogen from broiler litter during storage. However, further studies are suggested to evaluate the effectiveness tea waste. The study concluded that neem has a potential to reduce the nematode count.

**Keywords:** Litter, Nitrogen, Nematodes, Plant extracts