INTERNATIONAL JOURNAL OF SCIENCE AND NATURE

Www.scienceandnature.org

Short Communication

SCREENING OF FORAGES FOR THE PRESENCE OF CONDENSED TANNINS

Ngongeh, L.A. & Fakae, B.B.
Department of veterinary parasitology and entomology, university of Nigeria, Nsukka

ABSTRACT

Research has suggested that certain animal fodders may contain anthelmintic agents such as condensed tannins. In this study some 33 forages used by farmers were screened for the presence of condensed tannins. Methanolic extracts of the plant were scanned and extracts with peaks about 550nm suggestive of the presence of condensed tannins. *Cassia sieberiana, Psidium guajava, Urena lobota, Piliostigma thonningii, Nauclea latifolia,* and *Acacia nilotia* had prominent peaks at 550nm wavelength while the rest did not peak about that particular wavelength. Some of the forages fed to animals by farmers therefore contain condensed tannins but the contents vary between plant species.

KEY WORDS: Anthelmintic agents, scan

INTRODUCTION

Control of gastrointestinal nematodes has traditionally been by use of anthelmintics. There is no doubt that this has associated problems. The search of suitable means of control has suggested that certain animal fodders may contain anthelmintic agents. Recent examples include the report that selected condensed tannin yielding pastures could help to control helminths in grazing animals without recourse to anthelmintic use (Niezen *et al*., 1996), and that deliberate dietary intake of Quebracho tannin drastically reduced faecal output of *Trichostrongylus colubriformis* infected lambs (Butter *et al*., 1998, 2000). Some countries are poised to studying beneficial tree crops (Smith *et al*., 2000), for there is the need to establish whether feeding locally available plant materials rich in tannins could actually reduce parasitic burden in ruminants and hence improve their productivity (Butter *et al*., 2000). In order to exploit the local forage used by farmers, it was thought desirable to screen for the presence of tannins.

MATERIALS AND METHODS

Collection of forage and extraction

Known plants used as animal fodder were collected (Table 1). The samples were standardised/identified by a plant taxonomist in the Department of Botany, University of Nigeria, Nsukka, where voucher samples were preserved for reference. The samples were air-dried pulverised and processed for extraction. Quebracho (*Schinopsis species*) was obtained commercially.

Plant Extracts

For all the materials, 10mg of each pulverised air-dried material was exhaustively extracted with 1ml of 50% methanol overnight at 37ºC in an incubator. The extract was filtered with a fine sieve and spun down at 36000g for 20 minutes. The clear supernatant was aspirated and stored at 4% for further use.

Table 1. Medicinal plants and extracts

The samples were collected during the months of October and November from Enugu and Anambra states in eastern Nigeria. The plants used for the study include:

1. *Alchornea chordifolia*	*18. Hypoestes species*
2. *Aspilia africana*	*19. Magnifera* indica
3. Asystasia gigantica	20. *Napoleona imperalis*
4. *Alstonia*	*21. Nauclea* latifolia
5. *Acassia nilotia*	*22. Panicum maximum*
6. *Carica papaya*	*23Pennisetum polystachyon*
7. Cassia *sieberiana*	*24. Pennisetum purpureum*
8. *Cissus quadangularis*	*25 .Piliostigma thonningii*
9.*Calopogonium mucunoides*	*26. Psidium guajava*
	27. Sida acuta
10. *Clerodendron species*	*28. Synadrella nodiflora*
11. *Citrus paradisi*	*29. Ocimum*
12. *Chromolena ordoratum*	*30. Telfairia occidentalis*
13. *Dialum guineense*	*31. Uapaca* guinieensis
14. *Dssotis theifolia*	32. *Ureina lobota*
15. *Elaeis guineensis*	33. Quebracho
16. Emilia souchifolia	34. Tea
17. Gamelina arborea	35.Tannic acid

Acid-butanol test

50µl of the clear extract solution was added to 1ml of 2M HCl in a 1.5ml eppendorf vial. The vial with its contents was boiled in a water bath for one hour and then centrifuged for 10 minutes at 14,000g. The entire supernatant (1ml) was siphoned and reacted with 4ml of iso-butanol with vigorous shaking. The mixture was allowed to cool for 10 minutes. The upper butanol layer was siphoned and 3ml of it was used to determine its absorbance in a spectrophotometer at the wavelengths from 400 to 650nm. Tannic acid, Piliostigma and Quebracho extracts were included as controls. Extracts with peaks about 550nm were suggestive of the presence of condensed tannins (Bate-smith, 1977).

RESULTS

The absorbance scanned at the various wavelengths of the investigated forages are shown in Fig 1a and b. *Cassia sieberiana, Psidium guajava, Urena lobota, Piliostigma thonningii, Nauclea latifolia*, and *Acacia nilotia* had prominent peaks at 550nm wavelength while the rest did not peak about that particular wavelength.

DISCUSSION

The results do indicate that some of the plants used for animal feeding contained proanthocyanidin (condensed tannins), which have been shown to be capable of limiting helminth's protective enzymes activity (Fakae *et al*., 2000). The ranking of the absorbance, indicate that their contents vary as shown on Fig 1a and b and Table 1. The implication of this is that the quantity needed for a physiological effect may also vary with the particular forage.

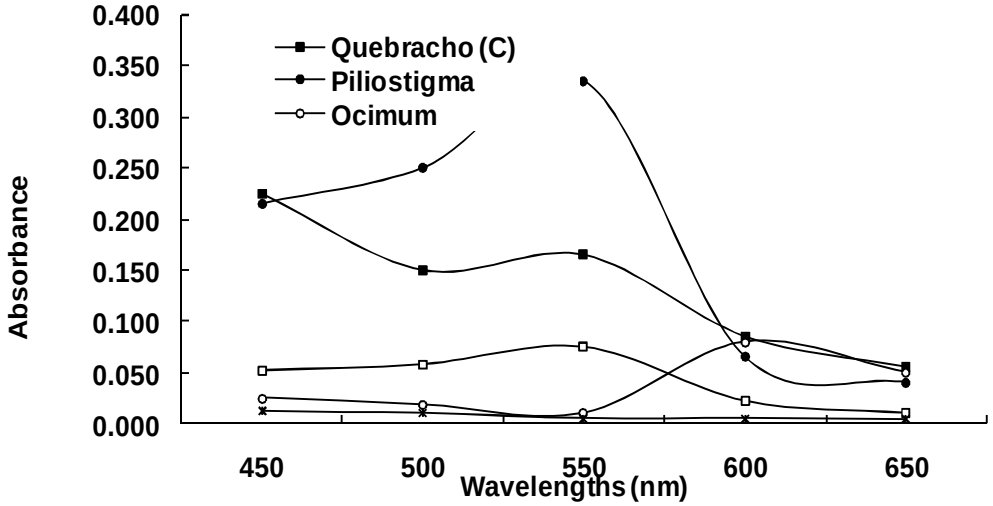

Fig 1a Scanning of forages and medicinal plants

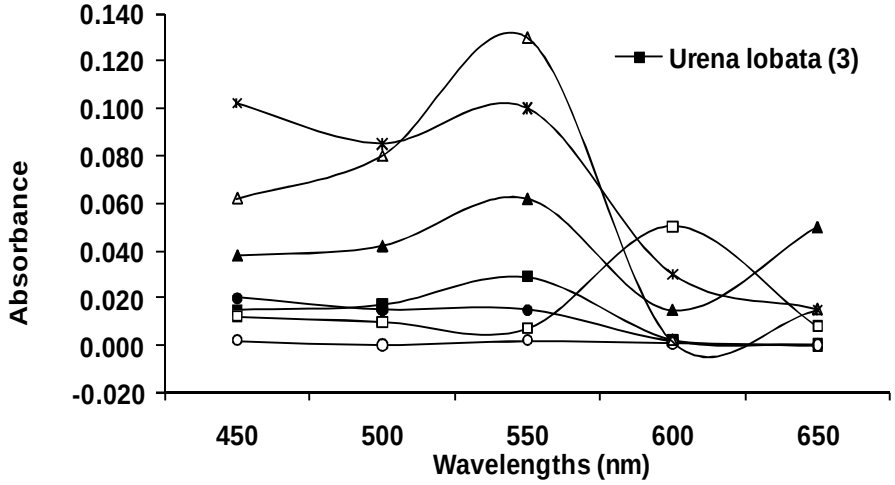

Fig 1b Scanning of forages and medicinal plants

REFERENCES

Bathe-Smith, E. C. (1977) Astringent tannins of *Acer* species. *Phytochem.* **16**: 1421-1426.

Butler, N. L, Dawson, J. M., wakelin, D. and Buttery, P. J. (2000) Effect of dietary tannin and protein concentration on nematode infection (*T. colubriformis*) in lambs. *Jn. of Agric. Sci., Cambridge.* **134**: 89-99.

Fakae, B. B, Cambell, A. M.,Barret, J., Scott, I. M.,Teesdale, P.H., Lieban,E, and Brophy , P. M. (2000) Inhibition of glutathione S-transferase(GSTs) from parasitic nematodes by extracts from traditional Nigerian medicinal plants. *Phytotherapy Research,* **14**:630-634.

Niezen, J. H.,Charleston, w. a. G., Hodson, J., Mackay, A. D., Leathwick, D. M. (1996) Controlling internal parasites in grazing ruminants without recourse to anthelmintics: Approaches, experiments and prospects. *Int. Jn*. for Para , **26**: 983-992.

Smith, T., Mlambo, V., Skosana, J. Owon, E., Mueller,-Harvey, P.J., Convoy, C. (2000) Use of tanniferous feeds to improve small holder goat production: Project to link R7424 (Tanzania), R7351 (Zambia) and R6953 (India) to increase dissemination, outputs, and impact (R7798). In: *Sustaining livestock in challenging dry season environments. Strategies for small scale livestock farmers. Proceedings of the third workshop on livestock production programme projects*. Inwe Lodge and ICCRISAT matobo, Zimbabwe, 26-28 Sept. T. Smith and S.H. Godfrey (eds). NRIL, Pembroke, Chatham Maritime. Kent, ME44NN, UK. Pp. 117-119.