

MEDICINAL PLANTS USED IN THE TREATMENT OF TUBERCULOSIS IN HUMANS AND ANIMALS BY IDOMA TRIBE OF NORTH CENTRAL NIGERIA

OFUKWU¹, R.A., AYOOLA², A. and AKWUOBU³, C.A.

¹Department of Veterinary Public Health and Preventive Medicine, ²Co-operative Extension Centre, ³Department of Veterinary Pathology and Microbiology, University of Agriculture Makurdi, Nigeria.

*Correspondence: E-mail: Ofu_kwu@yahoo.com, Tel: 08065799831

SUMMARY

A Survey of medicinal plants used for the treatment of tuberculosis in humans and animals by Idoma tribe of North central Nigeria was conducted from October 2001 to March 2002. Both multi-stage and stratified sampling techniques were used to select 273 respondents. Structured questionnaire and interviews were respectively administered to or conducted with the respondents. Clinical signs of tuberculosis in man and animals as described by the natives included progressive weight loss, dry skin, inflammation of superficial lymph nodes, dry hacking cough (with sputum in man), painful breathing and chest pain, low grade fever, and weakness. One hundred and seventy three (63.4%) of the 273 respondents were aware of the use of medicinal plants for tuberculosis in man. Only 93 (34.1%) of such persons could identify at least one of such plants. For animal treatment, 179 (65.6%) were aware but only 68 (38.0%) of such persons could identify at least one herb. Most of those who could identify herbs (knowledgeable respondents) were in the age group of 46 to 60 years. Respondents below the age of 20 years have the least knowledge. Of the knowledgeable respondents, elderly herbalists and fortune tellers were most knowledgeable (48.4%) followed by cattle pastoralists (29.0%) for human treatment. For animal treatment, the cattle pastoralists were significantly ($P < 0.05$) more knowledgeable (48.5%) than the herbalists (23.5%). The most common medicinal plants used in both man and animals, solely or in combination, were *Adansonia digitata*, *Anogessus leocarpus*, *Annona senegalensis*, *Combretum padicalatum*, *Vernonia amygdalina*, *Stereospermum kunthianum*, *Tapinatus dodoneifolius* and *Terminalia brownii*. Parts of the plants used were leaves, stem bark and roots which were, fresh, fairly dried or fully dried and boiled or pounded into powder for oral administration. Flavouring and sweetening agents included honey, potash salt, alligator pepper and ginger. Dosage of treatments was 175 to 350 ml, given two times a day for 3 to 9 months.

KEY WORDS: Medicinal plants, Tuberculosis, Idoma tribes

INTRODUCTION

Tuberculosis, a chronic contagious respiratory disease of zoonotic importance has become a resurgent problem in Nigeria. In Nigeria an annual loss of 5 million U.S Dollars in meat products alone about 120,000 human deaths due to the disease have been reported (Garba, 2002). Government and several international agencies have instituted intervention measures aimed at reducing the scourge. These measures are increasingly being hampered by several factors, which include increasing poverty level, poor housing condition, poor food habit, inconsistent government policy on tuberculosis control and increasingly ineffective, not readily available and expensive antimycobacterial drugs

has led to an increase in the use of indigenous knowledge system including medicinal plants by Idoma tribe (Okpeh, 2005). The homelands have suddenly become referral clinics for many Nigerians especially in communities. Some of the medicinal plants used by this tribe were reported to be effective in the treatment of tuberculosis and other respiratory or lung diseases of bacterial origin (Nwude and Ibrahim, 1980; Ibrahim *et al.*, 1980; Alade *et al.*, 1986; Hussaini and Deeni, 1991; Olukoya *et al.*, 1993; Nwude, 1977).

To the best of our knowledge, there is, however, no known concerted and systematic effort to identify and document the indigenous medicinal plants. In this communication, we report for the first time identification of indigenous medicinal plants used, methods of preparation and administration by

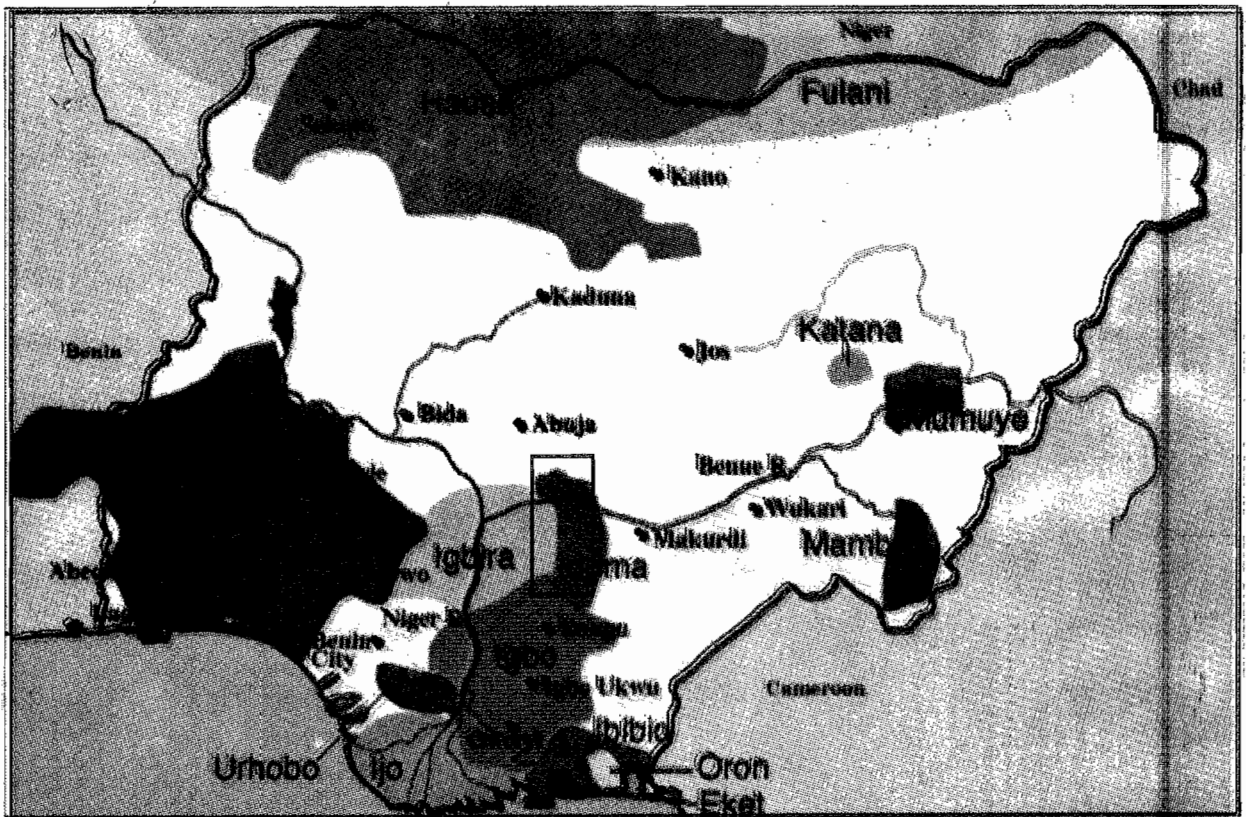
Idoma tribe of North Central Nigeria for the management of tuberculosis in man and animals.

MATERIALS AND METHODS

Study area

The traditional homelands of the Idoma tribe of North Central Nigeria are located in 19 local governments in four contiguous states of Benue, Cross River, Nassarawa, and Kogi (Figure 1). In these states, they are dialectically referred to as the Idoma, Iyala, Doma and Akpoto respectively. These areas of domicile are contiguous and lie within the southern guinea savannah region with an average annual rainfall of 1,250 mm. The land is generally a fertile plain with luxuriant vegetation and abundant drinking water sources from the transversing River Benue or its tributaries.

The indigenous tribe with a population of not less than four million (NPC 1991) are mostly low income farmers involved in crop and livestock production (Okpeh, 2005; Adejo and Okpeh, 2006). The hospitable nature of the natives, the topography and availability of grazing land has attracted other tribes including nomadic cattle Fulani. Some of these have Fulanis settled with or close to the towns or villages leading to intermarriages and cultural affiliation. This has led to a situation in which the area houses close to one million cattle, one and half million sheep, two million goats and two and half million poultry during dry season period (Njike, 1999). The Fulanis who normally settle in remote areas also use these indigenous plants to treat diseases of animals and family members.



□ Idoma homeland

Figure 1: Part of North Central Nigeria inhabited by the Idoma tribe

Survey

A survey to identify and document herbs used by indigenous tribe of Idoma Land to treat tuberculosis in man and animals was done from October 2001 to March 2002. A multi-stage sampling technique as described by Calvin *et al.* (1977) was used to select 13 wards out of 8 local government areas, and 21 villages. In each village, stratified simple random sampling was used to select and interview 273 respondents engaged in different occupations. They consisted of 93 females and 180 males, aged between 20 and 80 years.

The 273 respondents consisted of 105 elderly traditional herbalists and fortune tellers, 65 livestock owners and or traders, 63 cattle pastoralist and 39 others. The 39 others included civil servants, businessmen and women, youths, butchers and other abattoir workers. The consent of the respondents and the village elders were obtained using the village extension agents.

The respondents were given structured questionnaires to answer or were interviewed individually or in groups at farms, homesteads, markets and field during grazing. Interpreters were used where necessary. Signs indicative of tuberculosis were also noted. Information on plants and parts used, methods of preparation and administration, and sweeteners used were obtained. Where possible, the plants proffered were collected and identified by the indigenes, Hausa and botanical names. Some of the plants whose species could not be identified immediately were collected and sent to the Department of Forestry and Wildlife, University of Agriculture Makurdi, Nigeria for identification. Some other specimens were sent to the herbarium at the Department of Biological Sciences, Ahmadu Bello University, Zaria, Nigeria for identification of plants.

All the plants species in all cases were identified using the descriptions of Dalziel (1937) and Farnsworth *et al.* (1985).

RESULTS

The number of respondents and the names of medicinal plants and parts, preparations used for treatment of tuberculosis in humans and animals are shown in Tables I and II respectively.

One hundred and seventy three (63.4%) of the 273 respondents were aware of the use of medicinal plants for tuberculosis in man but only 93 (34.1%) of such persons could identify at least one of such plants. Ten (3.7%) respondents said they heard, but had not seen herbs being used. For animal treatment, 179 (65.6%) of the respondents were aware of the use of medicinal plants but only 68 (38.0%) of such persons could identify at least one of such plants. The age, sex and occupational distributions of knowledgeable respondents are shown in Tables III and IV respectively. Most of the knowledgeable respondents, 50.5% for human and 36.8% for animal treatments were aged 41 to 60 years. Respondents below the age of 20 years have the least knowledge. Elderly herbalists and fortune tellers were most knowledgeable (48.4%) followed by cattle pastoralists (29.0%) for human treatment. For animal treatment, the cattle pastoralists were significantly ($P < 0.05$) more knowledgeable (48.5%) than the herbalists (23.5%).

Of all the medicinal plants, *Adansonia digitata* (baobad tree), *Anogessus leocarpus*, *Annona senegalensis*, *Combretum padicalatum*, *Vernonia amygalina* (bitter leaf), *Stereospermum kunthianum*, *Tapinatus dodoneifolius* and *Terminalia brownie* (umbrella fruit tree) were proffered for in both man and animals. Preparation from *Cantella asiadica*, *Ceiba pentandra*, *Ocimum gratissimum* and *Ficus platyphylla* were used by the indigenous herbalists and elders used for humans only while *Jacaranda acutifolia*, *Guiera senegalensis*, *Usteria guinsensis*, *Azadirachta indica* (neem) and *Ocimum lamifolium* were used exclusively for animals.

Usually, recipes consisted of more than one plant or parts of plants, in equal proportions. The stem bark and leaves were more often used than the roots. Fairly dried plants parts were boiled in water for drinking or pound and dried for cooking

with pottage or ground grains (Kunu) for management of tuberculosis in humans.

Dried ground preparations were also mixed with animal feeds and salt, potash, honey, alligator pepper and ginger were added as flavouring agents.

TABLE I: Distribution of respondents and medicinal plants used for treatment of tuberculosis in humans by indigenous Idoma tribe of North Central Nigeria.

Plant Family	Botanical names	Vernacular		Drug Preparation/Administration	Knowledgeable respondents (%)
		Idoma	Hausa		
Bombacaceae	<i>Adansonia digitata</i>	Epu-owuochotu	Kuka	Dried leaves boiled in water for drinking 2 times only for 24 days	93 (33.0)
Bombacaceae	<i>Cantella asiatica</i>	Epu-oko	Labila	Dried pound bark boiled in water for drinking	88 (32.2)
Bursaceae	<i>Boswellia dalzielii</i>	Okopi	Hannu	Bark is pound and powder mixed with porridge	86 (31.5)
Loranthaceae	<i>Tapinatus dodoneifolius</i>	Okoklodu	Kardii	Leave, Bark boiled for drinking	63 (23.1)
Combretaceae	<i>Anogeissus schimperi</i>	Otra	Marke	Bark soaked or boiled in water for drinking	56 (20.5)
Combretaceae	<i>Anogeissus leioarpus</i>	Ofiotra	Kojli	Roots boiled in water for drinking	51 (18.7)
Compositae	<i>Verona amygdalina</i>	Okonache	Shiwaka	Pound leave fresh and squeeze for drinking	37 (13.6)
Combretaceae	<i>Combretum adicalatum</i>	Epagana	Aduse	Dried leave boiled for drinking	29 (10.6)
Bignoniaceae	<i>Stereospermum kunthianum</i>	Achechee	Sansani	Boil leave or Bark or roots in water for drinking	29 (10.6)
Annonaceae	<i>Annona senegalensis</i>	Ukpoko	Wanda-daji	Leaves or roots bark is pound, boiled and filtered for drinking	18 (6.6)
Labiatae	<i>Ocimum gatissimum</i>	Igbingbli	Liollebee	Bulb is boiled in water for drinking	16 (5.9)
Bombacaceae	<i>Ceiba pentandra</i>	Ochowu	-	Fresh leave is boiled in water for drinking	13 (4.8)
Moraceae	<i>Ficus platyphylla</i>	Ikpi	Gamji	Squeezed fresh leave or boiled for drinking	10 (3.7)
Coesalpinaceae	<i>Cassia occidentalis</i>	Anyeba	Tapassa	Fairly dried leaves boiled for drinking	6 (2.2)
Coesalpinaceae	<i>Cassia alata</i>	Anyeba-Adagba	Tapassa	Fairly dried leaves boiled for drinking	6 (2.2)
Combretaceae	<i>Terminalia brownii</i>	Udu	Baushe	Bark boiled in salted water for drinking	3 (1.1)
Bursaceae	<i>Commiphora Africana</i>	Agbetu	-	Bark boiled in water for drinking	2 (0.7)

- The dosage: 175 350 ml (1 coca cola bottle) of liquid given w times a day (morning and evening) after meal for 3 9 months.
- The percentages of the knowledgeable respondents were calculated as fraction of the total interviewed.

TABLE II: Distribution of knowledgeable respondents and medicinal plants used for treatment of tuberculosis in domestic animals by indigenous Idoma tribe of North Central Nigeria

Plant family	Botanical names	Vernacular		Preparation/Administration	Knowledgeable respondents (%)
		Idoma	Hausa		
Combretaceae	<i>Anogeissus leioarpus</i>	Ofiotra	Kojoli	Leaves, Bark and roots are boiled for drenching	68 (23.8)
Loranthaceae	<i>Tapinatus dodoneifolius</i>	Okoklodu	Kardii	Leaves, bark boiled in water for drenching	59 (21.6)
Combretaceae	<i>Combretum adicalatum</i>	Epagana	Aduse	Leaves dried and boiled in water for drenching	48 (17.6)
Bombacaceae	<i>Adansonia digitata</i>	Epu-owuochotu	Kuka	Fairly dried leaves or bark boiled in water for drenching	47 (17.2)
Combretaceae	<i>Anogeissus schimperi</i>	Ofiukpokpo	Dukuhi	Leaves and bark boiled in water for drenching	41 (15.0)
Compositae	<i>Vernonia amygdalina</i>	Okonache	Shiwaka	Fairly dried leaves boiled in water for drenching	38 (13.9)
Labiatae	<i>Ocimum lamifolium</i>	Igbingliadagba	Ladde	The dried bulbs are boiled for drenching	26 (9.5)
Bombacaceae	<i>Jacaranda acutifolia</i>	Pokile	Calonfa	Bark boiled in water for drenching	23 (8.4)
Caesalpinaceae	<i>Cassia occidentalis</i>	Anyeba	Tapassa	Fairly dried leaves boiled in water for drenching	17 (6.2)
Combretaceae	<i>Gutera senegalensis</i>		Sabara	Boiled leave in water for drenching	13 (4.8)
Combretaceae	<i>Terminalia Ivorensis</i>	Ofiudu	Wahe	Bark boiled in salted water for drenching	10 (3.7)
Combretaceae	<i>Terminalia brownie</i>	Udu	Baushe	Boiled leaves in water for drenching	7 (2.6)
Burksereae	<i>Boswellia dalzielii</i>	Epokopi	Hannu	Bark dried pound and mixed with feed	6 (2.2)
Bignoniaceae	<i>Stereospermum kunthianum</i>	Achechu	Sansani	Leave Bark and roots boiled in water for drenching	6 (2.2)
Meliaceae	<i>Azadirachta indica</i>	Odogoyalo	Dogonyaro	Roots boiled in water for drenching	2 (0.7)
Caesalpinaceae	<i>Usteria guinsensis</i>	Apio	-	Leaves, root boiled in water for drenching	2 (0.7)

- Dosage: 175 ml (½ coca cola bottle) for sheep, goats and pigs, 500 ml (1½ coca cola bottle) for cattle given 2 times a day (morning and evening) for up to 9 months.
- The percentages of the knowledgeable respondents were calculated as a fraction of the total interviewed.

TABLE III: Occupational distribution of knowledgeable respondents about medicinal herbs used for treatment of tuberculosis in humans and animals by Idoma tribes of North Central Nigeria

Occupation	No. knowledgeable respondents (%)	
	Human	Animals
Elderly herbalists/fortune tellers	45 (48.4) ^a	16 (23.5) ^a
Livestock owners/traders	18 (19.4) ^b	18 (26.5) ^a
Cattle pastoralists	27 (29.0) ^b	33 (48.5) ^b
Others	3 (3.2) ^c	1 (1.5) ^c
Total	93 (100.0)	68 (100.0)

*The figures in the same column with different superscripts are significantly different (P<0.05)

TABLE IV: Age and sex distributions of knowledgeable respondents about medicinal herbs used for treatment of tuberculosis in humans and animals by Idoma tribes of North Central Nigeria

Age groups (years)	No. knowledgeable respondents (%) for herbal treatment					
	Humans			Animals		
	Male	Female	Total (%)	Male	Female	Total (%)
0-20	4	1	5 (5.4) ^a	6	0	6 (8.8) ^a
21-40	14	9	23 (24.7) ^b	19	1	20 (29.4) ^b
41-60	36	11	47 (50.5) ^c	21	4	25 (36.8) ^b
> 60	13	5	18 (19.4) ^b	13	4	17 (25.0) ^c
Total	67 (72.0)	26 (28.0)	93 (100.0)	59 (86.8)	9 (13.2)	68 (100.0)

*The figures in parenthesis with different superscripts in the same column are significantly different (P<0.05)

DISCUSSION

The study revealed that tuberculosis; a resurgent highly fatal zoonotic disease in man and animal is being managed using plant materials by the locale. Some of the plants mentioned, *Adansonia digitata*, *Calotropis procera*, *Annona senegalensis*, *Stereospermum kunthianum*, *Combretum padicalatum*, *Guiera senegalensis*, were reported by several researchers to have ameliorative effects on nasopharyngeal and pulmonary diseases (Dalziel, 1937; Nwude and Ibrahim, 1980; Alade *et al.*, 1986; Mitscher *et al.*, 1988; Inha and Gulati, 1990; Gill, 1992). The antibacterial activities of the commonly used plants by the tribe have also been reported both in Nigeria (Okolo and Unaiigwe, 1984; Farnsworth *et al.*, 1985; Odoma *et al.*, 1986; Shittu and Bwala, 1988; Nwude, 1997) and elsewhere (Khan *et al.*, 1980; Chabras and Viso, 1991; Singh, 1994; Toyang *et al.*, 1995).

To the best of our knowledge however, this is the first systematic attempt to document, the information on indigenous knowledge of medicinal plants used for treatment of tuberculosis in man and animals in North Central Nigeria.

CONCLUSION

Several plant preparations are used by the tribe in tuberculosis infections in man and animals. The locals, however, do not know the active ingredients or side effects of the preparations. It is aim that the study will be used as a basis for screening of the identified plants to establish the active ingredients and the toxicological implications of their use. The folk medicine of the Idomas could be a source of drugs for the

management of tuberculosis in man and animal.

ACKNOWLEDGEMENTS

We express our profound gratitude to the Village Extension agents from the States Agricultural Development Project (ADPS) who served as enumerators and field workers. Our thanks also go to staff of the Herbarium of the Department of Biological Sciences, Ahmadu Bello University, Zaria, Nigeria for plant identification.

This work received financial support from the British Government as part of this work was conducted during the Overseas Development Association (ODA) assisted programme, Improve Farmers Participatory Programme of the Cooperative Extension Centre of the University of Agriculture Makurdi, Nigeria.

REFERENCES

- ADEJO, M.A. and OKPEH, O.O. (2006): Occupation and religion of Idoma tribe of Benue and Cross River State. *J. Hist. Persp.* (In press).
- ADEGOKE, E.E., AKISANYA, A.A. and NAQVI, S.H.Z. (1968): Studies of Nigerian medicinal plants. Preliminary survey of plant alkaloids. *J. W. Afr. Sci. Association*, **13**: 13-33.
- ALADE, P.J., DADA, J.D., AHMED, A.A. and YADOCK, K.A. (1986): Antibacterial activities of some medicinal plants from Soba Zaria Nigeria. In: The State of Medicinal Plant Research in Nigeria.

- Sofowora, A, Ed. Proceedings of Workshop, Ife-Nigeria.
- CALVIN, W.S., HANS, P.R. and HARLES, E.T. (1977): Epidemiology in Veterinary Practice. 1st Ed. Lea and Febiger Co., Philadelphia, U.S.A.
- CHABRA, S.C. and VISO, F.C. (1991): Antimicrobial activity of some Tanzanian plants used in traditional medicine. *Fito Terap.*, **62**(6): 499-503.
- DALZIEL, J.M. (1937): The Useful Plants of West Tropical Africa. Crown Agent; 612.
- FARNSWORTH, N.R., AKERELE, O., BRINGEL, A.S., SOEJARTO, D.D. and GUO, S. (1985): Medicinal plants in therapy. *Bull. W. H. O.*, **63**(6): 965-981.
- GARBA, S.A. (2002): Characterization of mycobacterial isolates from man and animals in Sokoto, Nigeria. *Nig. J. Vet. Med.*, **3**: 211-216.
- GILL, I. (1992): Ethnomedical uses of plants in Nigeria. University of Benin Press, Benin City; 276.
- IBRAHIM, M.A. and NWUDE, N. (1980): Plants used for the treatment of chest diseases in Nigeria. *Nig. J. Vet. Pharm. Ther.*, **3**: 274-280.
- IBRAHIM, M.A. (1986): Veterinary traditional practice in Nigeria. Livestock System Research in Nigerian Sub-humid Zones. Proceedings of the Seasonal ILCA/NAPRI Symposium, Kaduna-Nigeria. 29th October to 2nd November, 1986.
- IWU, M.M. (1994): African Medicinal plants, in search of new drugs based on ethnobotanical leads. *Cibafund Symposium*, **185**: 116-126.
- KHAN, M.R., NDAAHO, G., NKUNYA, M.H.H., WEVERS, H. and SAWHEY, A.N. (1980): Studies on African medicinal plants. I. Preliminary screening of medicinal plants for antibacterial activity. *Plantamedica (Supplement)*, 91-97.
- McCORKLE, E.M. (1986): An introduction to ethnoveterinary research. *J. Ethnobiol.*, **6**(1): 129-149.
- NATIONAL POPULATION COMMISSION, NPC. (1991): Nigeria Census Data Base; 182.
- NWUDE, N. and IBRAHIM, M.A. (1980): Plants used in traditional veterinary medical practice in Nigeria. *J. Vet. Pharm. Ther.*, **3**: 261-273.
- NWUDE, N. (1997): Ethnoveterinary pharmacology and ethnoveterinary practices in Nigeria; an overview. *Trop. Vet.*, **15**: 117-123.
- OKOLO, M.I.O. and UNAIGWE, J.E. (1984): Studies on traditional veterinary practice in Anambra State of Nigeria. Diseases and their treatments. *Nig. Vet. J.*, **13**(2): 14-22.
- OKPEH, O.O. (2005): Traditional practices among Idoma and Tiv tribes of Benue State. *Lower Benue Valley J.*, **2**: 30-35.
- OLUKOYA, D.K., IDIKA, N. and ODIGBEMI, T. (1993): Antibacterial activity of some medicinal plants from Nigeria. *J. Ethopharm.*, **39**(1): 69-72.
- SHITTU, M. and BWALA, H. (1988): Traditional veterinary care among the nomadic herdsman of Southern Borno State, Nigeria. *Livestock Farmer*, **8**(4): 27-34.
- SINGH, V. (1994): Ethnoveterinary medicinal plants used in Jammu, Kashmir, Ladateh and Marni Hills (Haryana) India. *Fito Terap.*, **66**(4):
- TOYANG, N.J., NUWANYAKPA, M., NDI, C., DJANGO, S. and KINYUY, W.C. (1995): Ethnoveterinary medicine practices in North West Province of Cameroon. Indigenous knowledge and Development Monitor Vol. I (3). Nufic-gran. The Hague Netherlands