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**ETHNOVETERINARY VALUES OF NIGERIAN MEDICINAL PLANTS: AN OVERVIEW  
ABSTRACT**

**Background**

Poor animal health is still a major problem limiting livestock production in sub-saharan Africa. Poverty and toxic effects of veterinary drugs have compelled poor resourced farmers to search for alternative medicine in Nigeria. In view of this literature search was carried out with a view to compiling medicinal plants that are being used in the treatment of livestock diseases in Nigeria.

**Methods**

The study was carried in Nigeria (name the place). Literatures from various journals that are addressing ethnoveterinary and ethnobotany were critically reviewed in order to identify the reported traditional medicinal plants used in treating animal diseases.

**Results**

More than 200 plants used in the treatment of animal diseases such as foot - and - mouth disease, mange, tuberculosis, pediculosis, etc. Some of these plants were: *Acacia nilotica*, *Gardenia erubescens*, *Vernonia amygdalina*, *Azadirachta indica* among others. Some of the searched plants were given to animals either directly or ground into powder and added to animal feeds. Others were administered to animals as concoctions, infusions, or decoctions. The responsible therapeutic phytochemicals were mainly alkaloids, tannins, saponins, glycosides, flavonoids, phenols, minerals and vitamins. Some medicinal plants were given either in combination with sodium chloride or potash. Before use, plants that had toxic or antinutritional compounds, such as oxalates, tannins, saponins, phytates, alkaloids, nitrate/nitrite and others were subjected to soaking, boiling, toasting or fermentation to remove the toxic elements

**Conclusions**

The identification of these plants can complement or supplement the available modern veterinary drugs with a view to providing animal protein for 70% malnourished Nigerian populace. The identified plants may also be included in modern veterinary pharmacopoeia. More so, phytochemical principles present in the plants can be fractionated, isolated and tested for acclaimed biological activities.

**Keywords:** Nigeria, Ethnomedicine, livestock diseases, malnutrition

**BACKGROUND**

34 Since the domestication of animals began thousands years ago, stock raisers and handlers  
35 have naturally been concerned about livestock health [1]. Poor animal health is still a major problem  
36 limiting livestock productivity in sub-saharan Africa including Nigeria [2]. In 1992, Nigeria livestock  
37 population totaled 199.55 million with estimated cost of US \$ 6,000 million [3]. Decline in funding  
38 veterinary services and animal health and cost of veterinary services have pushed poor resourced  
39 farmers to search for alternative medicine [4]. Historically, both human and animal medicine has  
40 relied heavily on plant materials [5] and most cultures of the world have a wealth of knowledge of  
41 herbal medicine for animals, human being and domestic plants [4]. Trado-veterinary medical practices  
42 still play important roles in many areas of Nigeria [6] and Africa south of the Sahara (7, 8). Most  
43 major pharmaceutical companies started a century ago by selling plant extract mention at least two [9]  
44 and approximately a quarter of all prescribed drugs currently sold in the western world still use active  
45 ingredients derived from plants (give example. Examples of such ingredients are artemisinin  
46 (antimalarial) from *Artemisia annua*, atropine (anticholmergic) from *Atropa beladona* and  
47 physostigmine (cholinergic agent) from *physostigmum venenosum* [10].

48 Winrock International [11] indicated that over ₦54 billion is lost in animal productivity as a  
49 result of animal's diseases. Onyeyili et al. [12] reported an outbreak of accidental plant poisoning of  
50 sheep in an arid zone of Nigeria. In 2006, livestock industry in Nigeria experienced a serious setback  
51 caused by outbreak of avian influenza, which wiped out many birds from extreme far north passing  
52 through middle belt to southern part of the country. Up to 8 species of tick borne pathogens have been  
53 reported in dogs from Jos, Nigeria, with *Babesia* species being the most prevalent [13]. About 70% of  
54 170 million Nigerian populations is malnourished due to inadequate intake of animal protein because  
55 of poverty [14].

56 Based on the fore mentioned information literatures were searched to elicit plants that are  
57 used to treat animal diseases in Nigeria with a view to boosting animal productivity by using  
58 improved products from identified medicinal plants that can manage various animal diseases.

59

## 60 **IDENTIFICATION OF THE PLANTS USED FOR ANIMAL DISEASES**

61 Past and recent text books, websites, journals, proceedings, other periodicals from Nigeria  
62 and other countries were critically reviewed in order to identify relevant information on the plants that  
63 have been used to treat animal diseases by livestock farmers in Nigeria. The plants and plant names  
64 (scientific, English, local), plant parts, therapeutic regimens, phytochemical principles and associated  
65 diseases were recorded. Plants used to treat poultry; large and small animal diseases were separated  
66 and grouped accordingly [15-126]. However, much information was obtained from the libraries of

67 Ahmadu Bello Univesity, Zaria, University of Agriculture Makurdi, University of Nigeria, Nsukka,  
68 University of Agriculture, Abeokuta, University of Jos among others.

69

## 70 **ETHNOVETERINARY VALUES OF THE PLANTS**

71 A list of more than 200 plants with various medicinal values used in the treatment of animal  
72 diseases in Nigeria were identified from various sources including literatures and personal contact  
73 with users of these medicinal plants. All the plants were obtainable in Nigeria with more diverse  
74 application to their medicinal uses amongst Hausa and Fulani cattle rearers of Northern part of  
75 Nigeria. Knowledge of medicinal uses of the plants are also applied by some minority ethnic groups  
76 of the north which include Nupes, Gwaris, Tivs, Idomas etc. The north-western, south-eastern and  
77 south-southern ethnic groups which include Yorubas, Igbos and Efik/Ibibio respectively applied the  
78 knowledge of ethnoveterinary medicine in their animal husbandry.

79 From the over 200 medicinal plants identified and reported to have values in the treatment of  
80 large animal diseases, 125 were reported to have therapeutic property in the treatment of large animal  
81 diseases (Table 1), while 68 had ethnomedicinal value in the treatment of poultry diseases (Table 2)  
82 and 22 medicinal plants had been used in the treatment of small animals' diseases (Table 3).  
83 However, the 125 plants reported for the treatment of large animal diseases have been tested using,  
84 camels, sheep, goats, horses, donkeys and cattle. About 30 out of 68 reported to have value in  
85 treatment of poultry diseases also were tested. But most of the plants reported to have value in the  
86 treatment of small animal diseases were tested using dogs, cats, rabbits, mice and rats [16-85].

87 Some plants such as *Vernonia amygdalina*, *Khaya senegalensis*, *Annona senegalensis*,  
88 *Anacardium occidentale*, *Mangifera indica*, *Abrus precatorius*, *Cassia occidentale*, etc have been  
89 demonstrated to be highly effective in the treatment of helminthosis in large animals. Also, *Paulina*  
90 *piñata*, *lagera pterodonta*, *Maytenus senegalensis*, *Carrisa edulis* were effective in the treatment of  
91 pasteurellosis. *Ocimum lamifolium*, *Hemizygia weiwitschii*, *Pericopsis laxiflora* and *Adenocarpus*  
92 *mannii* show therapeutic activity in the treatment of cowdriosis. *Acacia nilotica*, *Gardenia*  
93 *erubescens*, *Vigna unguiculata* and *Tapinathus glabiferus* were reported to be effective in foot-and-  
94 mouth disease in large animals (Table 1). Furthermore, *Cannabis indica*, *Datura metel*, *Solanum*  
95 *incanum* and *Solanum nodiflorum* were said to be effective in the treatment of Newcastle disease  
96 (Table 2). But *Elaeis guinensis*, *Citrus aurantium*, *Khaya ivorensis*, *Annona squamosa*, and *Tephrosia*  
97 *vogellii* were demonstrated to have high effect in the therapy of psoroptic mange in small and large  
98 animals (Table 1 and 3). Although *Azadirachta indica*, *Abrus precatorius*, *Nauclea latifolia* were  
99 demonstrated to have very high effect in the treatment of rodent malaria caused by *plasmodium*  
100 *berghei* in mice, many of the reported plants were demonstrated or claimed to have been used for the

101 treatment of several other diseases. The plants are *Annona senegalensis* used in the treatment of  
102 pediculosis, helminthosis and pasteurellosis. *Solanum nodiflorum* was claimed to have activity in the  
103 treatment of helminthosis, Newcastle disease, coccidiosis, fowl typhoid, and fowl cholera (Table 1  
104 and 2). *Khaya senegalensis* has been reported to be effective in the treatment of coccidiosis,  
105 amoebiasis, helminthosis and Newcastle disease (Table 2). *Abrus precatorius* was demonstrated to  
106 have efficacy in the treatment of rodent malaria both in terms of clearing parasite and improving  
107 haematological parameters of the infected mice (Table 3).

108 Leaves, stems, roots, rhizomes, bulbs, fruits, oils and flowers of the plants listed in this report,  
109 herbal veterinary practitioners in Nigeria created and adopted many formulas for medicinal  
110 applications. The formulations were dictated by circumstances; the environment where the herd's man  
111 (in case of Fulanis) stayed; the advice of his fortunetellers; the adversity of diseased condition and the  
112 Fulani's spiritual belief. The plant parts used and the availability and workability of the medicinal  
113 plants were also considered.

114 All the plants listed in this study and reported as having biological activity grew in mangrove  
115 swamps and rain forest in the south, bush region in the middle belt and thorny desert arid region in the  
116 far north. The plants were being used for the treatment of animal diseases in Nigeria as an  
117 alternative/complementary to orthodox medicine for better animal husbandry [16, 18].

118

## 119 **ETHNOVETERINARY MEDICAL CARE: THE ALTERNATIVE TO WESTERN** 120 **VETERINARY THERAPY**

121 The fact that over 200 medicinal plants are being used to treat animal diseases indicates that  
122 indigenous knowledge and practices would be useful in the promotion of animal health and  
123 production in Nigeria. Ethnoveterinary medical health care would be the only alternative to western  
124 veterinary therapy. These ethnoveterinary remedies which rely on local plant materials are practical,  
125 effective and cheap [24-28]. The observation that a preponderance of medicinal plants have value in  
126 treatment of animal diseases such as foot-and-mouth disease, rinderpest, kata, pediculosis,  
127 helminthosis, trypanosomosis, tuberculosis, Newcastle disease, fowl cholera, fowl typhoid etc (that  
128 among these affect the livestock of Nigeria, suggests a vast number of biologically active compounds  
129 in the plant kingdom that can be used in herbal veterinary medicine. Our findings are corroborated by  
130 the report of Aggarawal et al. [87] indicating that sick animals change their feed preferences to nibble  
131 at bitter herbs they would normally have rejected. For example, chimpanzee, chickens and sheep also  
132 behave in the same way. Lowland gorillas (*Gorilla gorilla gorilla*) whose 67% of their diet is fruits  
133 take 90% of their diet during infections, from the fruits of *Aframomum melegueta*, a relative of the  
134 ginger, a potent antimicrobial which keeps shigellosis and similar infections at bay [88]. The plant

135 also protects gorillas from fibrosing cardiomyopathy which has a devastating effect on captive  
136 animals. Some birds select nesting materials rich in antimicrobial agents which protect their young  
137 from harmful bacteria [96]. More so sick animals tend to forage plants rich in secondary metabolites  
138 such as tannins and alkaloids. Since these phytochemicals often have antiviral, antibacterial,  
139 antifungal and anthelmintic properties, a plausible case can be made for self-medication by animals in  
140 the wild [97]. Koala can live on the leaves and shoots of the *Eucalyptus*, a plant dangerous to most  
141 animals. Ancient Arabs fed their horses Alfa-alfa believing that it made the animals swift and strong  
142 [96]. The controversial anti-cancer herb marketed by Henry Hoxsey was inspired by a cancer stricken  
143 horse who ate unusual herbs [97].

144 A particular characteristic of plants is that the level and ratio of chemical constituents can  
145 vary within a species owing to differences in growth environment and heritable traits making the  
146 isolation and testing of active principles with probable medicinal values difficult [82]. Medicinal  
147 properties are dependent on secondary metabolites, such as glycosides, flavonoids, alkaloids, and  
148 saponins [81, 82], which may be available in all plant parts, and concentration is associated with a  
149 particular plant part (85). Solvents used in extraction of the secondary metabolites could also affect  
150 the quality and quantity of the metabolites yielded [80].

151 *Azadirachta indica* has potent antifungal activity against *Aspergillus fumigatus*, *Candida*  
152 *albicans*, *Cryptococcus neoformans* [124] and inhibited hatching of egg and larval development of  
153 *Haemonchus contortus* [104]. *A. indica* also showed relative antimicrobial activity against  
154 *Staphylococcus aureus*, *Escherichia coli*, *Enterococcus faecalis* and *Pseudomonas aeruginosa* [80].  
155 *Terminalia avicenioides* contain triterpenes such as arjunolic acid,  $\alpha$ -amyrin and 2,3,23-  
156 trihydroxylolean-12-ene [134] which exhibit larvicidal activity [137]. Plants listed in this report  
157 should not be abused but rather be used only for the listed medicinal purposes. Many species of  
158 *Crotalaria* are used in medicinal preparations and medicinal practice. *Crotalaria* poisoning occurred  
159 in livestock [59]. It contains pyrrolizidine alkaloids which are toxic to mammals [105]. Lack of  
160 controlled experiments on the reported plants means toxic levels have not been defined and the plant  
161 constituents may affect more than one body system. Use of more than the therapeutic values may lead  
162 to overdoses with serious consequences [16]. For example, catechins from *Acacia nilotica* causes  
163 oesophageal cancer. *Khaya senegalensis* contains limonoid which is a limonene-like component of  
164 volatile oil. It is toxic to insect [11]. *Azadirachta indica* contains azadirachtin which has insecticidal  
165 activity [103]. *Vitex doniana* contains aryl glycoside which is involved in induction of xenobiotic  
166 metabolizing enzyme, cell cycle regulation (apoptosis and proliferation), liver and immune system  
167 development and vascular remodeling [11, 49]. *Vitex doniana* is used for the treatment of worm  
168 infestation in animals. *Momordica balsamina* contains albumin, globulin, glutelin, amino acids and  
169 momordicine. But albumin and globulin form binding sites for acidic (e.g. penicillins, cephalosporins)

170 and basic (e.g. prazosine, quinidine) drugs, respectively [49]. Amino butyric acid is an inhibitory  
171 neurotransmitter [103]. Alliin and allicin from *Allium sativum* are antidiabetic [104]. Sulphur boost  
172 the immune status of animals. The antibacterial activity of *Cannabis sativus* may be attributable to  
173 cannabidiol, cannabigerol and tetrahydrocannabinol that causes euphoria. Cannabidiol can block  
174 anxiety produced by tetrahydrocannabinol [93]. *Cannabis indica* is used to treat infectious diseases  
175 in animals. *Mangifera indica* contains quercetin which is anti-hypertensive [98] but poses risk of  
176 stomach, intestine and urinary bladder cancer [91]. Cedar oil produced by *Cedrus deodara* causes  
177 inflammation of alimentary tract and kidney [103]. *Cannarium schweinfurthi* contains amyridin,  
178 phellandrine and limonene that have activity against insects. Toxalbumin produced by *Cassia*  
179 *occidentalis* causes toxicity in twin-lambs [100]. *Vitellaria paradoxa* used for snake envenomation  
180 may have protective activity against snake venom and so may serve as alternative or supplemental  
181 treatment to serum therapy (40). *Oryza sativa*, *Datura metel* and *Azadirachta* have also been  
182 reported to have ethnoveterinary values (141). *Allium cepa*, *Thuja orientalis*, *Embelia ribes*, *Lythrum*  
183 *salicaria*, *Hibiscus rosasinensis*, *Jatropha curcas*, *Curcuma longa*, *Carica papaya*, *Cassia fistula*,  
184 *Ananas comosus*, *Aloe vera* and *Guanicum officinale* have antifertility effects, hence can be used in  
185 birth control of free roaming dogs and cats [142]. The responsible antifertility principles are  
186 phytosterols, saponins, embelin, quercitol, steroid, salicylic acids and aloin [143]. *Allium porrum*,  
187 *Curcubita maxima* and *Brassica oleracea* can also be used as contraceptive in canine and feline  
188 population [144].

189 The plants reported in this study may not be an exhaustive list of medicinal species nor  
190 application. Medicinal plants are continually being discovered, and the changes in the traditional  
191 therapeutics can be continually expected, hence no compilation in this area of ethnoveterinary  
192 medicine is ever final. But the production and supply of these plants is a major factor in the systemic  
193 and regular use of the listed herbal preparations. Identifying the natural environment in which the  
194 plants appear should support the cultivation of the plants [85].

195

## 196 **THE STATE OF VETERINARY PRACTICE IN NIGERIA**

197 Although, the practice of veterinary medicine in Nigeria is faced with a number of set backs  
198 which include; cost of veterinary drugs; inadequate number of practicing vets (i.e. 1 vet: 37,500  
199 animals); quackery; lack of awareness about the importance of veterinary medicine; inadequate  
200 implementation of legislature concerning veterinary practice; merging of veterinary and agro-services  
201 under one ministry; inadequate budgetary allocation to agricultural sector; lack of motivation from the  
202 side of government to individuals to set up veterinary pharmaceutical companies; and unnecessary  
203 interference with services of veterinarians by medical doctors e.g. the outbreak of avian influenza in  
204 Nigeria in 2006 was a typical situation that brought an argument of who was to handle the situation; is

205 it a medical doctor or a veterinarian? The sporadic and endemic outbreak of Ebola virus infection in  
206 some West African countries including Nigeria in 2014 is another typical example. In the present  
207 outbreak of the disease, veterinarians have not been called to play their role for control of the disease.  
208 Although bitter kola and sodium chloride have been alleged to cure the disease, no scientific study has  
209 proven that. Therefore, the incorporation and integration of the useful knowledge about the plants into  
210 primary healthcare system of veterinary practice in Nigeria should be considered an issue of prime  
211 importance. Use of the plants would undoubtedly minimize the cost of treatment and limit side or  
212 toxic effects of orthodox veterinary drugs that are currently being used. By so doing animal  
213 productivity will increase, which invariably will lead to increased availability of animal protein that  
214 may serve 70% malnourished Nigerian populace, that are languishing in abject poverty. In addition,  
215 pharmaceutical industries in Nigeria should be encouraged to investigate the plants purported to have  
216 therapeutic value in animal diseases.

217

## 218 **AFRICA AND ASIA: POSSIBLE SOURCE FOR RAW MATERIALS OF VETERINARY** 219 **DRUGS**

220 As scientific studies and clinical trials on toxicity and standard doses of these plant materials  
221 could eventually result in their inclusion in the modern veterinary pharmacopoeia. The fact that some  
222 of the reported plants are being used to treat animal diseases in Nigeria, Uganda, Democratic Republic  
223 of Congo, Sri-Lanka, Nepal, South Africa and Saudi Arabia [113-122] may connote the origin of  
224 ethnoveterinary medicine in Africa and Asia. More so, the two continents could be sources for raw  
225 materials for synthesis of veterinary drugs. At the present time of economic meltdown, there is need  
226 for African Union (AU) to start investigating the plants in the region for their medicinal values in  
227 animal diseases. Similar work was done by various African countries in the field of human medicine  
228 [113]. After having established the plants, efforts should be made by the Governments of African  
229 Union to establish a regional pharmaceutical industry with intent to harnessing resources that will be  
230 used for manufacturing veterinary drugs in the region. By so doing, that will complement or  
231 supplement the available animal drugs and invariably bringing down the cost of veterinary drugs in  
232 Nigeria so as to boost livestock productivity in the poor region. Also, animal productivity can serve as  
233 source of revenue generation for countries under African Union. Such countries include Nigeria,  
234 Niger, Mali, Libya etc.

235

## 236 **CONCLUSION**

237           The presence of preponderance of medicinal plants that can be used in the treatment of animal  
238 diseases in Nigeria may suggest that Nigerian plants can serve as resource for veterinary drugs that  
239 can be used to treat a myriad of animal diseases.

240

#### 241 **DECLARATIONS**

#### 242 **ETHICS APPROVAL AND CONSENT TO PARTICIPATE**

243 Not applicable.

244

#### 245 **CONSENT FOR PUBLICATION**

246 Not applicable.

247

#### 248 **AVAILABILITY OF DATA AND MATERIALS**

249 Not applicable

250

#### 251 **REFERENCES**

- 252 1. Bierer B W: A Short History of Veterinary Medicine. East Lansing, Michigan State  
253 University Press, 1955.
- 254 2. Centre Technique de cooperation Agricole at Bural (CTA): Primary Animal Health care in  
255 African. Synopsis of the Seminar held at Balantyre, Malawi, 25-28<sup>th</sup>, September, 1985, 1987.
- 256 3. Bourn D, Wirt W, Blench R and Woolley E: Nigerian Livestock Resources Survey.  
257 FAO/WAR/RMZ 1994, 78(1): 49-58.
- 258 4. McCirkle CM, Mathias E and Schillhorn, Van Veen T W: Introduction: Ethnoveterinary  
259 Research and Development. Intermediate Technology Publication, 1996.
- 260 5. Kudi A C and Myint S H: Antiviral activity of some Nigerian medicinal plant extracts.  
261 Journal of Ethnopharmacology 1999, 68: 289-294.
- 262 6. Mez-Mengold L: History of Drugs. Totowa, NJ. Parthenon Publication 1<sup>st</sup> ed. 1971, 56-58.
- 263 7. Dharani N, Yenesew A, Aynekulu E, Twei B, Jamnadass R (2015) Traditional ethnoveterinary  
264 medicine in East Africa: a manual on the use of medicinal plants. Dawson IK ed. The World  
265 Agroforestry Centre (ICRAF), Nairobi, Kenya
- 266 8. Langford K A new guide to traditional plant-based medicines for livestock in East Africa March 2016  
267 [http://blog.worldagroforestry.org/index.php/2016/03/16/a-new-guide-to-traditional-plant-based-medicines-for-](http://blog.worldagroforestry.org/index.php/2016/03/16/a-new-guide-to-traditional-plant-based-medicines-for-livestock-in-east-africa)  
268 [livestock-in-east-africa.](http://blog.worldagroforestry.org/index.php/2016/03/16/a-new-guide-to-traditional-plant-based-medicines-for-livestock-in-east-africa)



- 269 9. Cox P A and Balick M J: The Ethnobotanical approach to drug discovery. *Sci Am* 1994, 271:  
270 82-87.
- 271 10. Mann A, Abalaka M E, Garba S A: Antimicrobial activity of the leaf extract of *Calotropis*  
272 *procera*. *Bioch Lett* 1997, 55; 205-210.
- 273 11. Mann A, Gbate M and Nda Umar A: Medicinal and Economic Plants of Nupeland. Jube  
274 Evans Books and publication, Bida, Nigeria 2003: 3-276.
- 275 12. Gefu J O, Abdu P A, Alawa CBI: Ethnoveterinary Practices Research and Development.  
276 Proceedings of an International Workshop on Ethnoveterinary practices held 14-18 August,  
277 Kaduna, Nigeria, 2000, 185.
- 278 13. Adamu M, Troskie M, Oshadu D O, Malatji D P, Penzhorn B L, Matjila P T: Occurrence of  
279 tick-transmitted pathogens in dogs in Jos, Plateau State, Nigeria. *BMC*.
- 280 14. Nigeria National Population Commission and ORC Macro, Nigeria Demographic and Health  
281 Survey, 2003. Preliminary Report, 2013.
- 282 15. Egbe I A, Akinyele I O: Effects of cooking on the antinutritive factors of Limabeans  
283 (*Phaseolus lunatus*). *Food Chem.* 1990, 35(2): 91-95.
- 284 16. Mahajan A, Dua S: Comparison of processing treatments in the composition and functional of  
285 properties of rape seed preparations (*Brassica campestris L. vartoria*). *Die Nabrung* 1994, 38:  
286 578-587, 1994.
- 287 17. Abdu P A, Jagun A G, Gefu J O, Mohammed A K, Alawa CBI, Omokanya A T: A survey of  
288 ethnoveterinary practices of agropastoralists in Nigeria. In: Gefu JO, Abdu PA, Alawa CBI  
289 eds. Ethnoveterinary practices Research not Development. Proceedings of an International  
290 Workshop on Ethnoveterinary practices, Kaduna, Nigeria, 2000: 253.
- 291 18. Abdu PA, George BDJ, Saidu SNA: The production, management and health of village  
292 chickens in Kaduna state, Nigeria. Proceedings of the 28<sup>th</sup> Annual NSAP Conference. 1999:  
293 473-475.
- 294 19. Abdu PA, Ibrahim MA, Ibrahim H, George BDJ and Saidu SNA: Ethnoveterinary knowledge  
295 and practices on the health and diseases of indigenous poultry in Hausa land. In: Gefu JO,  
296 Abdu PA Alawa CBI (eds). Ethnoveterinary Practices, Research and Development.  
297 Proceedings of International Workshop on Ethnoveterinary practices, Kaduna, Nigeria, 2000,  
298 185.
- 299 20. Abdu P A, Faya JN: The Efficacy of some Nigerian plants on helminthes found in local  
300 chickens. In: Gefu J O, Abdu P A, Alawa CBI (eds). Ethnoveterinary Practices, Research and  
301 Development. Proceedings of International Workshop on Ethnoveterinary Practices, Kaduna,  
302 Nigeria, 2000, 65-71.
- 303 21. Abdullahi SU, Abdu PA, Ibrahim MA, George JBD, Shittu LO, Adekeye JO and Kazeem  
304 HM: Incidence of diseases of poultry caused by non-viral infectious agents in Zaria, Nigeria.  
305 World's Poultry Congress Amsterdam. The Netherlands 1992.
- 306 22. Adegeye AI, Kpi AE, Akinyodoye VO, Diltoh JS, Oluyemi JA and Anakiri FS: Economic  
307 analysis of Nigerian poultry industry. Federal livestock Department, Federal Ministry of  
308 Agric Water Resources and Rural Development, Lagos, Nigeria 1988.

- 309 23. Adeyinka. Screening of Vernonia amygdalina for anthelmintic properties. In: Gefu JO, Abdu  
310 PA. Alawa CBI (eds). Ethnoveterinary practices, Research and Development. Proceedings of  
311 International Workshop on Ethnoveterinary practices Kaduna, Nigeria, 2000, 49 - 55.
- 312 24. Atawodi SE: Antibacterial effects of Combretum glutinosum and Trapinathus dodoneifolius  
313 on Salmonella gallinarum and Salmonella pullorum. In: Gefu JO, Abdu PA, and Alawa CBI  
314 (eds). Ethnoveterinary Practices, Research and Development. Proceedings of International  
315 Workshop on Ethnoveterinary practices, Kaduna, Nigeria, 2000, 185.
- 316 25. Atawodi SE, Usman M, Bulus ST, Atawodi JC, Wakawa L and Ameh DA: Herbal treatment  
317 of some protozon and parasite diseases of poultry in the middle belt of Nigeria. In: Gefu JD,  
318 Abdu P A, Alawa CBI (eds). Ethnoveterinary Practices Research and Development.  
319 Proceedings of International Workshop on Ethnoveterinary practices Kaduna, Nigeria, 2000,  
320 78 - 84.
- 321 26. Atawodi SE, Ameh DA, Ibrahim S, Andrew JN, Nzelibe HC, Onyike EO, Anigo KE, James  
322 DB, Njoku GC, Sallau AB: Indigenous knowledge system for treatment of trypanosomosis in  
323 Kaduna State of Nigeria. In: Gefu JO, Abdu PA, Alawa CBI (eds). Ethnoveterinary Practices,  
324 Research and Development. Proceedings of International Workshop on Ethnoveterinary  
325 practices, Kaduna, Nigeria, 2000, 85 – 89.
- 326 27. Atawodi SE: Prospects of ethnoveterinary practices in the control of ectoparasites. In:  
327 ruminant livestock in Nigeria. In: Gefu JO, Abdu PA, Alawa CBI (eds). Ethnoveterinary  
328 practices, Research and Development. Proceedings of International Workshop on  
329 Ethnoveterinary practices, Kaduna, Nigeria, 2000: 90-94.
- 330 28. Cavier RC: Chemotherapy of intestinal nematodes. In: Chemotherapy of Helminthosis vol. 1,  
331 Pergamon press, Oxford, 1973: 215-436.
- 332 29. Chiezey NP, Getu JO, Jagun AG, Abdu PA, Alawa CBI, Magaji SO, Adeyinka IA and Eduvie  
333 LO: Evaluation of some Nigeria plants for anthelmintic activity in young cattle PP 38-48. In:  
334 Gefu JO, Abdu PA, Alawa CBI (eds). Ethnoveterinary Practices Research and Development.  
335 Proceedings of International Workshop on Ethnoveterinary Practices, Kaduna, Nigeria, 2000:  
336 38-48.
- 337 30. Farnsworth NR, Akerde O, Andney SB and Djaji DS: Medical Plants in therapy. WHO Bul  
338 1985: 63(6): 965-981.
- 339 31. Dalziel JM: The Useful Plants of West Tropical Africa, Crown Agents, 1937: 612.
- 340 32. Fatope MO, Takeda Y, Yamashita M, Okabe H and Yamauchi T: New Cucurbitane  
341 triterpenoids from Momordica charantia. J Nat Prod 1990: 53(6): 1491-1492.
- 342 33. Dalziel JK: Local treatment of ear mite infestation in a colony of rabbits in the mild hills of  
343 Western Nepal. Vet Rev Kath, 1996: 11(1): 30.
- 344 34. Durojaiye OM, Sanni MO: Evaluation of the lure and kill potential of Ficus exasperate (Sand  
345 paper leaf) against fleas of indigenous fowls. Seminar presented at Federal College of Animal  
346 Health and Production Technology. IAR&T, Ibadan on 7<sup>th</sup> September, 2005.
- 347 35. Ebbo AA, Elsa AT, Etuk EU, Ladan MJ and Saganuwan SA: Weight reducing and  
348 antiamphetamine effects of Amblygonocarpus andongensis in Wistar albino rats. J Res Biosci  
349 2005: 4(2); 39-43.

- 350 36. Etkin NL, Ross PJ, Muazgami I: The indigenization of pharmaceutical therapeutic transitions  
351 in rural Hausa land. *Soc Sci Med* 1990; 30(8): 919-928.
- 352 37. Fabiyi JP: Incidence of the helminth parasites of the domestic fowl in Vom area of Benue-  
353 Plateau State, Nigeria. *Bul Epizoot Dis Afr* 1972; 20; 235-238.
- 354 38. Fakae BB, Umeorozu JM, Oraika LJE: Gastrointestinal helminth infection of the domestic  
355 fowl (*Gallus gallus*) during the day season in Eastern Nigeria. *J Afr Zool*, 1991; 105: 503-  
356 508, 1991.
- 357 39. Fatihu MY: Prevalence and pathology of gastrointestinal parasites of poultry in Zaria,  
358 Nigeria. M Sc. Thesis. Department of Pathology and Microbiology, Faculty of Veterinary  
359 Medicine, Ahmadu Bello University, Zaria, Nigeria 1990.
- 360 40. Frieburghaus F, Kamisky R, Nkanya MHN and Brun R: Evaluation of African medical plants  
361 for their in vitro trypanocidal activity. *J Ethnopharmacol*. 1996; 55(1): 1-11.
- 362 41. Gadzama EN, Strivasta GC: Prevalence of intestinal parasites of market chickens in Borno  
363 State. *Zariya Vet* 1986; 1(2): 126-128.
- 364 42. Gbile ZO: Ethnobotany taxonomy and conservation of medicinal plants. In: Sofowora A. ed.  
365 The State of Medicinal Plants Research in Nigeria, U.I press, Nigeria 1986.
- 366 43. Hirudkar US, Desapande PD, Narladka BW, Bapat ST and Moregaonkar SD: Sarcoptic  
367 mange in sheep. Haematological and biochemical changes during treatment with herbal  
368 medicine. *Indian J* 1997; 74 (10): 834-836, 1997.
- 369 44. Ibrahim MA, Nwude N, Aliu YO and Ogunsusi RA: Traditional concept of animal disease  
370 and treatment amongst Fulani herdsman in Kaduna State of Nigeria. ODI pastoral Network  
371 Paper 1983; 16: (1)1-6.
- 372 45. Ibrahim MA, Nwude N, Ogunsusi RA and Aliu YO: Screening of West African plants for  
373 anthelmintic activity. *ILLA Bul* 1984; 17:19-23.
- 374 46. Ibrahim MA: Veterinary traditional practice in Nigeria. Livestock systems research in  
375 Nigerian subhumid zone. In: Von Kaufman R, Chater S, Blench R (eds). Proceedings of the  
376 2<sup>nd</sup> ILCA/NAPRI symposium held in Kaduna, Nigeria, 1986: 183-203.
- 377 47. Ibrahim H: Ethnoveterinary medical practices in five states of Northern Nigeria. DVM Project,  
378 Department of Veterinary Physiology and Pharmacology, Faculty of Veterinary Medicine,  
379 Ahmadu Bello University Zaria, Nigeria 1990.
- 380 48. Ibrahim MA, Abdu PA: Ethnoagro-veterinary perspectives on poultry productions. In:  
381 McCorkle M, Mathias-Mundy E, Schillhorneds TVW. *Ethnoveterinary Research and*  
382 *Development*. IT publications, London, 1990: 103-115.
- 383 49. Iwu MM: Handbook of African Medicinal plants. CRC press, Boca RaGn, Fl.1993: 435.
- 384 50. Irobi ON: Activities of *Chromolaena odorata* (Compositae) leaf extract against *Pseudomonas*  
385 *aeruginosa* and *Streptococcus faecalis*. *J Ethnopharmacol* 1993; 37(1): 51-53.
- 386 51. Lowe J, Soladoye MO: Some changes and corrections to names of Nigerian plants since  
387 publication of *Flora of West Tropical Africa* (2<sup>nd</sup> ed.) and *Nigeria Trees*. *Nig J Bot* 1990; 3(1):  
388 1-24, 1990.

- 389 52. Iwu MM: African medicinal plants in the search for New drugs based on ethnobotanical  
390 leads. Ciba Found Symposium 1994: 185: 116-126.
- 391 53. Jagun AG, Abdu PA, Chiezey NP, Magaji SO, Alawa CBI and Mohamud AK: Screening of  
392 Nigerian herbal plants for anthelmintic activities in animals 1. Preliminary for drugs on  
393 *Khaya senegalensis* and *Vernonia amygdalma*. Presented at the 35<sup>th</sup> Annual Congress of the  
394 Nigerian Veterinary Medical Association, held in Abuja Oct. 26-31, 1998.
- 395 54. Khan MR, Ndaalio G, Nkunya MHH, Wevers H and Sandhey AN: Studies on African  
396 medicinal plants part 1. Preliminary Screening of medicinal plants for antibacterial activity.  
397 *Planta Medica* 1980: 91-97.
- 398 55. Mgbojikwe LO, Okoye ZSC: Partial characterization of the active acaricidal principle in the  
399 aqueous stem bark extract of *Adenium obesum* BSE/E/015 29<sup>th</sup> March – 1<sup>st</sup> April, 2000, NDA  
400 Kaduna, 2000: 24.
- 401 56. Narladkar BW, Bhikane AU, Shastri UV, Kulkarni DD and Ali M: Concomitant psoroptic  
402 and demodectic mange infestations in goats with reference to pestoban treatment. *Indian Vet J*  
403 1995: 72(12): 1294-1296.
- 404 57. Ndi C, Mumah ET, Ndokwo KJ, Mfi AN, Mbekum T, Asah H, Ekue FN and Toyong JN:  
405 Ethnoveterinary plants used in the north-west province of Cameroon. In: Gefu JO, Abdu PA,  
406 Alawa. CBI (eds). Ethnoveterinary practices, Research and Development proceedings of  
407 Ethnoveterinary practices held 14-18 August, 2000, Kaduna, Nigeria, 2000: 154-159.
- 408 58. Nokk AJ, Ibrahim S, Arowosafe LI, Aawondi A, Onyenekwe PC, Whong CZ: The  
409 trypanocidal effect of *Cannabis sativus* constituents in experimental animal trypanosomosis.  
410 *Vet. Ham. Toxicol.* 1994: 36(6): 522-524.
- 411 59. Nuhu H, Shok M, Abdurrahman EM: Ethnomedical practices and toxic herbs. The case of  
412 *Crotalaria* species in Zaria. In: Gefu JO, Abdu PA, CBI (eds). Alawa, Ethnoveterinary  
413 Practices, Research and Development. Proceedings of Ethnoveterinary practices held 14-18  
414 August, 2000, Kaduna, Nigeria, 2000: 107-114.
- 415 60. Nuwanyankpa A, Toyang. Ethnoveterinary medicine practices in Cameroon. The Heifer  
416 Internation Projects Exchange: Appropriate livestock Technology for Developing World.  
417 1996: 83
- 418 61. Nworgu FC: Utilization of leaf meals in broiler production Post Graduate Seminar presented  
419 at the Animal Science Department, University of Ibadan, Nigeria 1990.
- 420 62. Nworgu FC: Utilization of leaf meals broiler production Ph. D. Thesis, University of Ibadan,  
421 Nigeria 2003.
- 422 63. Nworgu FC, Onabakin AM, Obadina TA: Performance and haematological indices of weaned  
423 rabbits served fluted pumpkin (*Telfaria occidentalis*) leaves extract, 2005 (in press).
- 424 64. Nworgu FC, Ogungbenro SA, Solesi KS: Effects of fluted pumpkin (*Telfaria occidentalis*)  
425 leaf extract supplement on the performance and haematological indices of broilers 2005. (in  
426 press).
- 427 65. Nwude N: Nigeria plants that may cause poisoning in livestock *Vet. Bull.* 1977: 47(11); 811-  
428 817.

- 429 66. Nwude N, Ibrahim MA: Plants used in traditional veterinary medicinal practice, in Nigeria.  
430 Journal of Veterinary Pharmacol Therapeut 1980: 3:261-273.
- 431 67. Nwude N: Ethnoveterinary pharmacology and Ethnoveterinary practices in Nigeria: An  
432 overview. Paper presented at the Inaugural Review and Planning Workshop on Naturally  
433 Coordinated Research Programme on Livestock Diseases NVRI, Vom, 24<sup>th</sup> – 28<sup>th</sup> March,  
434 1997.
- 435 68. Ogbangba KO, Wakhe SN: The effect of dictary inclusion of *Manssonia altissima* on feed  
436 intake, feed efficiency and feed conversion of laying birds and cocks. In: Dairo, FAS, Fajemi;  
437 Lehin SOK and Onibi GE. Proc of 10 Annual Conference of Animal Science of Nigeria on  
438 12<sup>th</sup> - 15<sup>th</sup> September, 2005.
- 439 69. Ogunjunmo SO: The role of extension in ethnovetrinary medicine in Nigeria pp 115-123. In:  
440 Gefu, JO, Abdu, PA, CBI Alawa. Ethnovetrinary practices, Research and Development.  
441 Proceeding of Ethnovetrinary Practices held 14-18 August, 2000, Kaduna, Nigeria.
- 442 70. Okolo MIO, Unaigwe JE: Studies on traditional veterinary practice in Anambra State of  
443 Nigeria. Diseases and their treatments. Nig Vet J 1984: 13(2): 14-22.
- 444 71. Okon ED, and Enyenihi NU: A study of Parasites of local fowls in Oron, Cross-River State,  
445 Nigeria. Nigeria Journal of Parasitology 1980: 1(2): 82-86.
- 446 72. Okpanyi SN: Antiinflammatory effect of *A. indica* In: perspective in medicinal plant research  
447 today. Drug Research and Production Unit, Faculty of Pharmacy, University of Ife, Nigeria  
448 1977: 89.
- 449 73. Oliver B: Medicinal plants in Nigeria. Nigerian College of Arts, Science and Technology,  
450 Ibadan, Nigeria, 1960.
- 451 74. Olukoya DK, Idika N, Odugbemi T: Antibacterial activity of some medicinal plants from  
452 Nigeria. J Ethnopharmacol. 1993: 39(1): 69-72.
- 453 75. Onyeyili PA, Chibuzo GA, Brisibe F and Egwu GO: Accidental Plant poisoning of sheep in  
454 an arid zone of Nigeria. FAO/WAR/RMZ 1994: 78(1): 73-76.
- 455 76. Orji EC, Oguezue DC, and Orji ME: Evaluation of antimicrobial activities of leaf extracts of  
456 *Murinda lucida* and *Erythrina senegalensis* for medicinal uses. Int J Gender Health Stud 2003;  
457 1(1): 79-83.
- 458 77. Raul P, Pedraza M, Manuch P: Animal helath care in India. Information Centre for Low  
459 External Input and Sustainable Agriculture (ILE/A) Newsletter 1990: 8(3): 22-23.
- 460 78. Roger B: Hausa Names for Trees and Plants. Draft prepared for comment only. Cambridge,  
461 England. 2006: 63.
- 462 79. Saganuwan AS, Uko OJ: Nutritive potential of Neem seed kernel in cockerels. J Sci Indus  
463 Stud 2005: 3(1): 26-29.
- 464 80. Saganuwan AS, Gulumbe ML: In vitro antimicrobial activities testing of *Abrus precatorius*  
465 cold water leaf extract on *Salmonella typhimurium*, *Escherichia coli* and *Klebsiella*  
466 *pneumonia*. J Sci Technol 2005: 4(3): 70-73.

- 467 81. Saganuwan AS, Gulumbe ML: Evaluation of *Sida acuta* subsp. *acuta* leaf/flower  
468 combination for antimicrobial activity and phytochemical constituents, *Afr J Clin Exper*  
469 *Microbiol* 2006; 7(2): 83-88.
- 470 82. Saganuwan AS, Gulumbe ML: Evaluation of in vitro antimicrobial activities and  
471 phytochemical constituents of *Cassia occidentalis*. *ARI* 3(3): 566-569.
- 472 83. Saganuwan AS, Gulumbe ML: Screening of *Vernonia amygdalina* for in-vitro antimicrobial  
473 activities and phytochemical constituents. *J Med Pharmaceutic Sci* 2007; 3(4): 32-37.
- 474 84. Saganuwan AS, Gulumbe ML: Antibacterial activity and phytochemical analysis of  
475 *Amaranthus pinosus* and *Ipomea sarifolia*. *Orient J Med* 2008; 20(1-4); 38-44.
- 476 85. Saganuwan AS: Tropical plants with antihypertensive, antiasthmatic and antidiabetic value. *J*  
477 *Herb, Spices Medic plants* 2009; 15: 24-44.
- 478 86. Saganuwan AS: Toxic potential of dry *Curcuma sativa* fruit/seed combination in swiss  
479 albino mice. Book of Abstract. Annual conference of Nigerian Society for Indigenous  
480 Knowledge and Development (NSIKA) held 13<sup>th</sup> – 16<sup>th</sup> Nov. 2006 at Institute of Agricultural  
481 Research Training, Moor Plantation, Ibadan, Nigeria 2006: 1.
- 482 87. Saganuwan SA: Toxicological and Antimalarial Effects of Aqueous Extract of *Abrus*  
483 *Precatorius* in Swiss Albino Mice. Ph. D. Thesis Submitted to the Department of  
484 Pharmacology Postgraduate School, Usmanu Danfodiyo University, Sokoto, Nigeria, 2012:  
485 242.
- 486 88. Sharma LD, Bahga HS, Soni BK: Anthelmintic Screening of three indigenous medicinal  
487 Plants against *Ascaridia galli* in poultry. *Indian Vet J* 44(8): 665-669.
- 488 89. Shittu M, Bwala H: Traditional veterinary care among the nomadic herdsman of Southern  
489 Borno State, *Nig Livestock Farmer* 1988; 8(2-4): 27-34.
- 490 90. Talakal TS, Dwivedi SK, Shama SR: In vitro and in vivo antitrypanosomal activity of  
491 *Xanthoxylum strumarium* leaves. *J. Ethnopharmacol.* 1995; 49(3): 141-145.
- 492 91. Tindall HD: *Vegetables of the Tropics*. Macmillan press, London, 1983: 533.
- 493 92. Toyang NJ, Nuwanyakpa M, Ndi C, Django S and Kinyu WC: Ethnoveterinary medicine  
494 practices in Northwest Province of Cameroon. *Indigenous Knowledge and Development*  
495 *Monitor*. Nuffic – CIRAN, The Hague, The Netherland 1995, 1: 3
- 496 93. Winrock International. *Assessment of Animal Agriculture in Sub-Sahara Africa*. Winrock  
497 International Institute for Agricultural Development, Morilton, Arkansas, USA, 1992.
- 498 94. World Health Organization. *Tropical Diseases Today: The challenges and opportunities*.  
499 WHO Bull. Switzerland, 1975.
- 500 95. Aggarwal BB, Sundaram C, Malami N and Ichikawa H, Curcumin: The Indian Solid gold.  
501 *Adv Exp Med Biol* 2007; 595: 1-75.
- 502 96. Cindy E: *Wild Health: How Animals keep Themselves well and what we can learn from*  
503 *them*, Houghton, Mofflin, 2002.
- 504 97. Castleman M: *The New Healing Herbs: The Ultimate Guide to Natives Best Medicines*.  
505 Rodale Press, 2002: 84.

- 506 98. Ichida Y: Birds use herb to protect their nests. Proceedings of the 104<sup>th</sup> General Meeting of  
507 the American Society for Microbiology. [http://www.science](http://www.science.blog.com/cms/node/2776,2004) blog.com/cms/node/2776,2004
- 508 99. Hutchings MR, Alhanasiadou S, Kyriazakis I and Gordon IJ: Can animals use forage in  
509 behavior to combat parasites? Proc. Nutr. Soc.
- 510 100. Clarke EGC, Clarke ML: Veterinary Toxicology, EIBS and Bailliere Tindall, New York,  
511 970:438
- 512 101. Akinlaje OA, Ahmed AB, Ajagbonna OP and Oloredo BR: Some biochemical effects of  
513 Various doses of aqueous seed extracts of *Cassia occideitalis* in rabbits. Biosci Res Commun  
514 2003: 15(1): 85-90.
- 515 102. Saganuwan SA: Some medicinal plants of Arabian Peninsula. J Med Plant Res 2010: 4(9):  
516 766-788.
- 517 103. Saganuwan SA: A photo album of some medicinal plants of the Nigerian middle belt. J Herb  
518 Spice Med Plants 2010: 16(3):219-292.
- 519 104. Sofowora A: Medicinal Plants and Traditional Medicine in Africa, John Willey and sons,  
520 New York 1993.
- 521 105. Garg SK: Veterinary Toxicology. IBS publishers and Distributors, New Delhi, 2004: 321.
- 522 106. Eghianruwa KI: A Dictionary of Pharmacology and Toxicology. Stirling-Horden publishers  
523 (Nig.) ltd. Lagos 2009: 585.
- 524 107. Evans WC: Trease and Evans Pharmacognosy, 15<sup>th</sup> edition, W.B. Saunders, Imprint of  
525 Elsevier, New Delhi, 2009: 585.
- 526 108. Marlowe JL, Puga A: Arylhydrocarbon receptor, cell cycle regulation, toxicity and  
527 tumorigenesis. J Cell Biochem 2005: 96: 1174-1184.
- 528 109. Rifkind A: CYP1A in TCDD toxicity and physiology with particular reference to CYP.  
529 dependent arachidonic acid metabolism and other endogenous substrates. Drug Metab Rev  
530 2006; 38: 291-335.
- 531 110. Tripathi KD: Essentials of Medical Pharmacology, 5<sup>th</sup> edition, Jaypee Brothers Medical  
532 Publishers (P) ltd., New Delhi, 2003: 8-75.
- 533 111. Katzung B: Basic and Clinical Pharmacology, International edition, McGraw Hill, London,  
534 2004: 864-873.
- 535 112. Saganuwan AS: Some specific phytochemicals with potentials of becoming novel drugs. In:  
536 Abstract Book, The First Mediterranean Symposium on Medicinal and Aromatic Plants,  
537 Gazinagosa the Turkish Northern Cyprus, 2013: 366.
- 538 113. Adjanohoun E, Ahiyi EA, Ake Assi L, Elewude JA, Fadoju SO and Gbile SO: Traditional  
539 medicine and pharmacopoeia contribution to Ethnobotanical and Floristic studies in western  
540 Nigeria. OAU/ST&RC, Lagos, Nigeria 1986: 205.
- 541 114. Bahmani M and Eftekhari Z: An ethnoveterinary study of medicinal plants in treatment of  
542 diseases and syndromes of herd dog in southern regions of Ilam provine, Iran. Comp Clin  
543 Pathol 2013: 22: 403 – 407.

- 544 115. Offiah N, Makama S, Elisha IL, Makoshi MS, Gotep JG, Dawurung CJ, Oladipo OO,  
545 Lohlium A and Shamaki D: Ethnobotanical survey of medicinal plants used in the treatment  
546 of animal diarrhea in Plateau State, Nigeria. *Vet Res* 2011; 7: 36.
- 547 116. Maikai VA, Abubakar U, Salman AA and Inuwa TN: Preliminary survey of medicinal plants  
548 used in treatment of animal trypanosomosis in Kaduna State, Nigeria *Ethnobotanical leaflets*  
549 2010; 14: 319 – 326.
- 550 117. Alyemeni MN, Sher H, Wijaya L: Some observations on Saudi medicinal plants of veterinary  
551 importance. *J Med Plant Res* 2010; 4(21): 2298 – 2304.
- 552 118. Van der Merwe D, Swan GE, Botha CJ: Use of ethnoveterinary medicinal plants in cattle by  
553 Setswana-speaking people in the Madikwe area the Northwest province of South Africa. *Jl.*  
554 *S. Afr. Vet. Ass.* 2001; 72(4): 189 – 196.
- 555 119. Acharya KP, Acharya M: Traditional knowledge in medicinal plants used for the treatment of  
556 livestock diseases in Sardikhola VDC, Kaski, Nepal. *J Med Plant Res* 2010; 4(2): 235 – 239.
- 557 120. Piyadasa HDW: Traditional systems for preventing and treating animal diseases in Sri Lanka.  
558 *Rev Sci Tech Off Int Epiz* 1994; 13(2): 471 – 486.
- 559 121. Chifundera K: Livestock diseases and the traditional medicine in the Bushi area Kivu  
560 province Democratic Republic of Congo. *Afr Stud Monog* 1998; 19(1): 13 – 33.
- 561 122. Nalule AS, Mbaria JM, Olila D and Kimenju JW: Ethnopharmacological practices in  
562 management of livestock helminthes by pastoral communities in the dry lands of Uganda.  
563 *Livestock Res Rural Dev* 2011; 23(2).
- 564 123. Bassey ME: Phytochemical investigations of *Tapinanthus globiferus* (Loranthaceae) from two  
565 hosts and the taxonomic implications. *Int J Chem Envir Pharmaceut Res* 2012; 3(2): 174 –  
566 177.
- 567 124. Drewes FE, Van Staden J: Aspects of the extraction and purification of solasodine from  
568 *Solanum aculeastrum* tissues. *Phytochem Analysis* 2007; 6(4): 203-206.
- 569 125. Meera MR, Kumar S, Kalidhar SB: Phytochemical investigation of *Parkinsonia aculeate*.  
570 *Indian J Pharmaceut Sci* 1999; 61(5): 315-316.
- 571 126. Suleiman MM, McGaw LJ, Naidoo V and Eloff JN: Detection of antimicrobial compounds by  
572 bioautography of different extracts of leaves of South African tree species. *Afr J Tradit*  
573 *Complement Altern Med* 2010; 7(1): 64 – 78.
- 574 127. Pandian S, Badami S, Ravi S: In vitro antioxidant of *Oldenlandia herbacea* and isolation of  
575 9,9-dimethyl hecosan and 23-ethyl cholest-23-en 3ol. *Nat Prod Res* 2008; 17: 1510-1515.
- 576 128. Nuhu H, Abdurrahman EM, Shok M: Comparative analysis of the alkaloids of three  
577 *Crotalaria* species. *Nigerian J Pharmaceut Sci* 2009; 8(2): 54-58.
- 578 129. Chaudhary AK, Ahmad S, Mazumder A: *Cedrus deodara* (Roxb.) Lound: a review on its  
579 botany, Phytochemical and Pharmacological profile. *Pharmacog J* 2011; 3(23): 12 – 17.
- 580 130. Singh SK, Pradeepa MS, Chetana H, Raj N and Veerana GAL: Antifertility efficacy of aerial  
581 part of *Crotalaria verrucosa* in female albino rats. *Pharmacologyonline* 2011; 3: 700-720.
- 582 131. Setzer WN, Ogungbe IV: In-silico investigation of antitrypanosomal phytochemicals from  
583 Nigerian Medicinal plants. *Plos Integr Trop Dis* DOI:10.1371/Journalpntd.0001727, 2012.



- 584 132. Liu M, Katerer DR, Gray AI and Seidel V: Phytochemical and antifungal studies on  
585 Terminalia mollis and Terminalia brachystema Fitoterapia. 2009; 80(6): 369-373.
- 586 133. Bello MO, Abdulhammed M, Ogunbeku P: Nutrient and anti-nutrient phytochemicals in  
587 Ficus exasperate Vahl leaves. Int J Sci Eng Res, 2014; 5(1): 2172-2181.
- 588 134. Mann A, Ibrahim K, Oyewale AO, Amupitan JO, Fatope MO and Okogun JI: Isolation and  
589 elucidation of three triterpenoids and its antimycobacterial activity of Terminalia  
590 avicennioides. American J Organic Chem 2012; 2(2): 14-20.
- 591 135. Chindo BA, Yau J, Danjuma NM, Okhale SE, Gamaniel KS and Becker A: Behavioural and  
592 anticonvulsant effects of the standardized extract of Ficus platyphylla stem bark. J  
593 Ethnopharmacol 2014; 54(2): 351-360.
- 594 136. Mann A, Ibrahim K, Oyewale AO, Amupitan JO, Fatope MO and Okogun JI. Isolation and  
595 elucidation of three triterpenoids and its antimycobacterial activity of Terminalia avicenoides.  
596 Am J Organic Chem 12012, 2(2): 14-20.
- 597 137. Fatope MO, Salihu L, Asante SK and Takeda Y: Larvicidal activity of extracts and  
598 triterpenoids from Lantana camara. Pharm Biol 2002, 40(8): 564-567.
- 599 138. Ibrahim H, Mdau BB, Ahmed A and Iliyas M: Anthraquinones of Cissus populnea Guill &  
600 Ferr (Amplidaceae). Afri J Trad Complem and Alternat Med 2011; 8(2): 140-143.
- 601 139. Adamu M, Naidoo V, Eloff JN: The antibacterial activity, antioxidant activity and selectivity  
602 index of leaf extracts of thirteen South African tree species used in ethnoveterinary medicine  
603 have excellent antifungal activities. BMC Complem Alterna Med 2012; 12:213.
- 604 140. Soares AM, Ticli FK, Marcussi S, Lourenco MV, Januario AH, Sampaio SV, Giglio JR,  
605 Lomonte B and Pereira PS. Medicinal plants with inhibitory properties against snake venoms.  
606 Curr Med Chem 2005, 12(22): 2625 – 2641.
- 607 141. Parthiban R, Vijayakumar S, Prabhu S and Yabesh JGEM. Quantitative traditional knowledge  
608 of medicinal plants used to treat livestock diseases from Kudavasal taluk of Thiruvavarur  
609 district, Tamil Nadu, India. Rev Bras Farmacogn 2016, 26(1): 109 – 121.
- 610 142. Gideya S, Ribadiya C, Soni J, Shah N, and Jain H. Herbal plants used as contraceptives. Int J Curr Pharmaceut  
611 Rev Res 2011, 2(1): 47 – 53.
- 612 143. Khare C. Indian Medicinal Plants: An Illustrated Dictionary. Springer Science + Business Media LLC. Available  
613 online at [www.springer.com](http://www.springer.com)
- 614 144. Junior AS. Assessment of Some Nigerian Medicinal Plants for Antifertility Value in Rattus norvegicus. DVM  
615 Project submitted to University of Agriculture, Makurdi, Nigeria, 2016: 1 – 6.
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- 618

619 Table 1: Tropical plants that are used to treat large animal diseases in Nigeria

S/No.	Scientific, generic, species Family, scientific and English name(s)	Vernacular names	Part(s) used	Therapeutic regimens(s)	Phytochemical principles	Animal disease(s)	References
1.	Mimosasae <i>Acacia nilotica</i> (locust bean)	Bagaruwa (H) Gabaruwa (N)	Dried bark, fruits, and seeds	Infusion of pounded plant parts used to wash affected parts	Gallotannins, catechins	Foot and mouth disease	103
2.	Rubiaceae <i>Gardenia erubescens</i> Syn: <i>Gardenia aquella</i> (Gardenia)	Gaude (H) Dingali (F)	Seeds, root	Seed powder with egret and chicken faeces	Crocin, tannin	Foot-and-mouth disease	103
3.	Papilionaceae <i>Vigna unguiculata</i> (common bean)	Wanke (H) Agwa (I) Ezo (N) Ewa (Y)	Seeds, flower	The powder with egret and chicken faeces	Proteins	Foot-and-mouth disease, oedema, inflammation	11
4.	Compositae/Asteraceae <i>Vernonia amygdalina</i> (Bitter leaf)	Shiwaka (H) Ewuro (Y) Tsula (N) Olubo (I)	Leaves	The powder mix with salt and infusion is given oftenly	Vernodalin, vernolepin, vernomygdn, tannins, saponin, vitamin C, Root is toxic	Helminthosis, bacteria infection	83, 103
5.	Melastomataceae <i>Khaya senegalensis</i> (Mahogany tree)	Madaci (H), Ono (I) Dalchi (F) Wuchi (N) Oganwo (Y)	Barks, seed oil	The powder with potash or bran give: root powder is applied topically	Limonoid, sapoletin, tannins, saponins, sterol, manganese	Helminthosis, bacterial infection, ectoparasites infestation, trypanosomosis, dysentery	103
6.	Meliaceae <i>Azadirachta indica</i> (Neem tree)	Nimu (N) Dogonyaro (I) Dogonyaro (H)	Barks, oil	Infusion of the powder with potash or salt given; oil is rubbed	Nimbin, azadiractin, salanin,, meliacin, limbolide	Helminthosis, sarpcoreptic, psoroptic mange, inflammation	79, 103
7.	Sapotaceae <i>Vitallaria paradoxa</i> , <i>Butyrospermum parkii</i> ; <i>Batyrospermum paradoxum</i> (Shea butter tree)	Kadanya (H) Karereyi (F) Ori (Y), Kochi (N)	Barks	Bark infusion or decoction is given	Fixed oils, alkaloids	Helminthosis, dermatomycosis , poisoning, dysentery, diarrhoea	88, 103
8.	Verbenaceae <i>Vitex cienkowskii</i> , Syn; <i>vitex doniana</i> (Black plum)	Dinya (H) Dinchi (N) Oriri (Y)	Barks, leaves, fruits	Decoction is given to calves.	Arylglycoside	Helminthosis, skin infection, colic, dysentery, diarrhea	103
9.	Cucurbitaceae <i>Momordica balsamina</i> (Balsam	Garahuni (H) Ejinrin (Y) Ibuzo akban	Leaves	Powder mix with cattle urine or the infusion	Momordicine glutelin, albumin,	Helminthosis	103

	pear)	ndene (I) Garafini (N)		is given to calves.	globulin, aminobutyric acid		
10.	Liliaceae/Aliaceae <i>Alium sativum</i> (Garlic)	Tafarnuwa (H) Taparnuwa (F) Tafarnuwa (N), Aayu (Y)	Leaves	Decoction is given to animals	Allicin, alliin, sulphur, oil, flavonoid, saponin, Vitamins A,B,C	Pasteurellosis	85, 103, 104
11.	Caesapiniaceae <i>Tamarindus indica</i> , (Tamarind tree, Indian tamarind)	Tsamiya (H) Darachi (N) Ajagbon (Y), Icheku Oyibo (I)	Roots	Decoction is prepared from A. senegalensis and T. indica, given.	Tannins, tartaric, malic and citric acids	Helminthosis, trypanosomosis	103, 104
12.	Annonaceae <i>Annona senegalensis</i> (Sour sop)	Gwandar juji (H), Dukuje (F) Dukuhi (F), Labo (Y) Numgberechi (N), Uburuocha (I)	Roots	Decoction is prepared with root of T. indica and A. senegalensis and give to animals	Tannins, annonaine, mucilage	Pediculosis, helminthosis, pasteurethosis, lousness, cough, Trypanosomosis , diarrhea, dysentery	11, 103, 104
13.	Burseraceae <i>Boswellia dalzielii</i> (Frankinsecence tree)	Ararabi (H) Gogagi (N)	Stem bark	The powder mixed with feed and given to animals	Bassorin, resin, boswellinic acid, essential oil, gum	Pediculosis, Trypanosomosis , lousness	11, 103, 104
14.	Moreaceae <i>Ficus platyphylla</i> (Gutta percha tree)	Gamiji (H) Dundehi (F) Gbagun, Gbanchi dzurugi (N) Afomo (Y)	Barks, leaves	The powder with salt or potash is given to animal for licking	Saponins, flavonoids, tannins	Contagious plurpneumonia (CBPP), prophylaxis threatening abortion	104, 135
15.	Cannabaceae <i>Cannabis indica</i> (Indican shot)	Bakalele, Bakare kare (H)	Leaves	Infusion is given to animals	Tetrahydrocanna binol, cannabidiolic acid, canabigerol	Antibiotic	102, 104
16.	<i>Afzelia africana</i> (African Afzelia, counter wood tree)	Kawo (H) Akpalata (I) Bachi (N) Apa (Y)	Leaves, stembark	Decoction or infusion given to animals	Alkaloids. Tannins	Helminthosis, Trypanosomosis	103, 104
17.	Anacardiaceae <i>Mangifera indica</i> (Mango)	Mungoro (N) Mangolo (I) Mangoro (Y) Mangwaro (H)	Roots	Roots infusion with salt is given to animals	Tannins, resins, quercetin, glycoside, flavonoids, Vitamins A,B & C, saponin	Helminthosis, rinderpest, ringworm, scabies, hepatic diseases	11, 103, 104
18.	Rutaceae <i>Citrus aurantium</i> , Syn: <i>Citrus sinensis</i> (Lemon tree)	Lemu maizaki (H) Lemu nasara (N)	Root bark	Mix the powder with butter and apply through the anus	Citric acid, volatile oil	Trypanosomosis	11, 102 – 104

19.	Myrsinaceae <i>Embelia ribes</i> Syn: <i>Embelia glandulifera</i> (False pepper)	Baran kabit (A)	Berries, leaves, oil	Powdered berries mixed with food; leaves extract rubbed	Embelin, villangine, rapanone	Psoroptic mange, Tape worm infestation, ring worm	
20.	Pinaceae <i>Pinus deodara</i> Syn: <i>Cedrus lubant</i> , <i>Cedrus deodara</i> (Deodar cedar)	Shaj-ul-jim (A)	Bark	Decoction is made and given powder is mixed with feed.	A and B himachalene, atlantone, himachalol, cedar wood oil	Antidote to snake bite, dysentery, skin diseases, ulcer	103, 104
21.	Burseraceae <i>Canarium Schweinfurthii</i> (False walnut)	Atile (H) Mbiji (I) Esha (N) Origbo (Y)	Bark	Decoctions made and given to animals; the smoke repel or kill insects	Amyrin, limonene, phellandrine, resin, tannin, saponin	Helminthosis, insecticide	102
22.	Anacardiaceae <i>Anacardium occidentale</i> (Cashew)	Kashew (H) Kausu (I) Kashiwu (N) Kaju (Y), Shase (T)	Stem bark	The powder is mixed with animal feed; Smoke repel or kill insects	Cardol, sitosterin, gallic acid, anacardic acid, phenol, resorcinol, tannin	Diarrhea, antifungal, antibiotic, infertility, arthritis, hepatitis	11, 103, 104
23.	Caesapiniaceae <i>Senna occidentalis</i> , <i>Cassia occidentalis</i> (Negro coffee)	Tapassa (F) Kwarkwati (H) Okama (I) Rere (Y), Gaya (N)	Leaves, seeds	Infusion or decoction is given to animals; Smoke repel insects	Tannins, resins, sennoides A,B & C, toxalbumin, fixed oil, flavonoid	Bacterial infections, black quarter, foot-and-mouth disease, Helminthosis, debility, constipation, tuberculosis, anaemia, oedema, antiviral, antifungal	11, 83, 103, 104
24.	Convolvulaceae <i>Ipomea sarifolia</i> ( Child cigaret )	Sigar yara (H) Lakanko (N) Odoko (Y)	Leaves	The powder is mixed with feed: concoction can also be given	Alkaloid, tannin, saponin, flavonoid	Collibacillosis, pasteurellosis, dystocia, helminthosis cough	11, 84
25.	Amaranthaceae <i>Amaranthus pinosus</i> (Spiny amaranth)	Namijin gasaya (H) Tete degum (Y) Kunguraku(I) Inine ogwu (I) Ekan shanshangi (N)	Leaves	The powder is mixed with feed; concoction is given to animals	Alkaloids, tannin, saponin, flavonoid, hydrocyanic acid	Colibacillosis, pasteurellosis	11, 84
26.	Anacardiaceae <i>Lamnea barteri</i> Syn: <i>Lamnea Kerstingii</i>	Faru (H) Yinchi (N) Ekika (Y)	Root bark, stem bark	The powder is mixed with cow fat and give	Tannins	Trypanosomosis, tuberculosis, babesiosis,	103, 104

	(Monkey akee)	Sonyi (F)		orally		haematuria	
27.	Myrtaceae <i>Psidium guajava</i> (Guava)	Gwaba (H) Ngoyaabehi (F) Ugwoba (I) Goyiba (N), Guafa (Y)	Roots, Leaves	Decoction with salt is given to animals: leaf infusion is given	Saponin, sapogenin, eugenol, quarcetin, vitamins A& B group	Trypanosomosis, Helminthosis, scours, diarrhea, antimicrobial, cough, dysentery	11, 103, 104
28.	Mimosasae <i>Parkia biglobosa</i> Syn: <i>Parkia clappertoniana</i> (Niffa)	Dorowa (H) Ogirili (I) Lonchi (W) Iru, Igba (Y)	Roots, Leaves	Infusion is given to animals: powder is also mixed with feed	Tannins, saponins, alkaloids	Trypanosomosis	11, 103, 104
29.	Bombacaceae <i>Adansonia digitata</i> (Baobab tree, Monkey bread tree)	Kuka (H) Akpo (I) Muchi (N) Oshe (Y)	Leaves	The powdered leaf is mixed with cold water and salt and give to animals	Adansomine, flavonoside, oxalates, uronic acid, catechins	Trypanosomosis	11, 103, 104
30.	Vitaceae <i>Cissus populnea</i> (Kangaroo vine)	Dafara (H) Labata (H) Korolambawo (N) Ajawa (Y)	Leaves	The decoction is given to animals to drink	Anthraquinone, Physcion, chrysophanol	Trypanosomosis	138
31.	Combretaceae <i>Terminalia avicenoides</i> ( )	Baushe (H) waha (F)	Stem bark	The decoction with palm oil and cheese is given to animals	Castalagin, flavogallonic acid, dilactone argunolic acid, $\alpha$ -amyrin, 2,3,23-trihydroxyoleanc-12-ene	Trypanosomosis	11, 103, 104
32.	Solanaceae <i>Capsicum frutescens</i> (Pepper)	Barkono (H) Yakayiringi (N) Ataibile (Y)	Fruits	Pound with groundnut and give the animals to eat	Capsaicin, oil, ascorbic acid	Trypanosomosis	11, 103, 104
33.	Papilionaceae <i>Lonchocarpus laxiflorus</i> (Senegal lilac)	Shuni (H)	Stem barks	The powder mixed with guinea corn powder and potash and give to animals	Indicant	Trypanosomosis	103
34.	Fabaceae <i>Parkinsonia aculeate</i> (Jemsalen thorn)	Sasabani (H)	Stem bark	The powder of stem bark of <i>P. aculeata</i> and <i>P. senegalensis</i> and leaf powder of <i>Striga</i> spp given	Glycerol, sitosterol, glycerides	Trypanosomosis	125
35.	Mimosasae <i>Prosopis africana</i> (Iron wood)	Kiriya (H) koha (F) Ubwa (I) sanchi (N),	Stem bark	The decoction of stem bark of <i>P. africana</i> and <i>P. africana</i>	14 $\alpha$ -demethylase anthraquinones, xanthones, berberine,	Trypanosomosis	103, 104

		Ayah (Y)		with potash	chromenes		
36.	Combretaceae <i>Gueira senegalensis</i> (Moshi medicine)	Sabara (W)	Leaves	The decoction is given to animals	Tannins, alkaloids, catechins	Trypanosomosis	103
37.	Caesalpiniaceae <i>Piliostigma reticulatum</i> Syn: <i>Piliostigma thoningii</i> (Camel's foot)	Kalgo (H) Barkehi (F)	Seeds	The powdered seed is given to animals	Alkaloids, tannins	Trypanosomosis	103
38.	Solanaceae <i>Solanum spp</i> (Garden egg)	Yalo (H) Ahera (I) Yengiy (N) Igba (Y)	Leaves	The powdered is mixed with drinking water and given to animals	Amino-4-ethyl glyoxaline, solanine, trigonelline, choline	Trypanosomosis	11, 49, 103, 104
39.	Asparagaceae <i>Albuca bracteata</i> (Wild onion)	Gadali (H)	Leaves	The powder is put in drinking water	-	Trypanosomosis	49, 104
40.	Solanaceae <i>Nicotiana tobaccum</i> (Tobacco plant)	Taba (H) Taaba (F) Taba (N)	Leaves	The powder of <i>N. tobaccum</i> , stem bark of <i>D. dalzieli</i> and <i>A. obesum</i> is given to animals	Nicotine: CNS stimulant and carcinogenic	Trypanosomosis, pasteurellosis, ectoparasites infestation	49, 104
41.	Apocynaceae <i>Saba florida</i> (Rubber wine)	-	Stem bark	The decoction with salt is given to animals	Vitamins A & E, lipids	Trypanosomosis	49, 104
42.	Lauraceae <i>Cassytha filiformis</i> (Green duder, Seashore duder)	Runfa gada (H) Aca-agadi (Y) Solo chenche (N) Ominiginigin il (Y)	Seeds	The powdered decoction is given to animals	Laurotetanine, mucilage, tannins	Trypanosomosis, fertility	49, 104
43.	Lythraceae <i>Lawsonia inermis</i> (Henna plant)	Lalle (H) Lali (N) Lali (Y)	Leaves	The powder with ground nut is given	Lawsonide, tannins resin	Trypanosomosis	102, 103, 104
44.	Fabaceae <i>Crotalaria retusa</i> (Rattle Box; Devil bean)	Gyadar yara (H) Korupo (Y) Birji-bei (F)	Whole plant	The decoction is bathed	Monocrotaline	Oestrus, scabies, colic, drive away snake	103, 104
45.	Fabaceae <i>Crotalaria lachnosema</i> (Gamba-pea)	Farar birana (H) korupo (Y) Birji-beri (F)	Whole plant	The decoction is bathed	Crotaline	Oestrus, scabies, colic, liver disease flatulence	49, 103, 104
46.	Fabaceae <i>Crotalaria microcarpa</i>	Birananar zomo (H)	Whole plant	The powder is put in water and given to	Pyrrrolizidine N-oxide	Liver diseases	49, 103, 104

	(Yew)			animals			
47.	Fabaceae <i>Crotalaria juncea</i> (Bengal hemp)	Hudar awaki (H)	Whole plant	Decoction is made and given to animals	Trichodesmine, senecionmine	Haemoptysis in horses	49, 103, 104
48.	Fabaceae <i>Crotalaria fulva</i> (Twany crotalaria)	Bi rana (H)	Whole plant	Decoction is made and given to animals	Fulvine, monocrotaline	Medicine: not specified	49, 103
49.	Fabaceae <i>Crotalaria incana</i> (Fuzzy rattlebox)	Jar bi rana (H)	Whole plant	Decoction or infusion is given to animals	Integerrimine	Medicine: not specified	103, 104
50.	Fabaceae <i>Crotalaria laburnifolia</i> (Muna)	Bi rana (H)	Whole plant	Decoction or infusion is given to animals	Anacrotine, crotafoline, hydroxy-senkirikine	Medicine: not specified	49, 103, 104
51.	Fabaceae <i>Crotalaria mucronata</i> (Smoth rattlepod)	Farar bi rana (H)	Whole plant	Decoction or infusion is given to animals	Intergerrininie	Medicine: not specified	49, 103, 104
52.	Fabaceae <i>Crotalaria recta</i>	Gujyar awaki (H) Gyadar awaki (H)	Whole plant	Decoction or infusion is administered to animals	Monocrotaline	Medicine: not specified	49, 103, 104
53.	Fabaceae <i>Crotalaria verrucosa</i> (Bird flower)	Bi rana (H)	Whole plant	Decoction or infusion is administered to animals	Pyrrolizidine alkaloid	Medicine: not specified	49, 103, 104
54.	Fabaceae <i>Crotalaria gorensis</i> (Morula; Cat thorn)	Bi rana (H)	Whole plant	Decoction or infusion is given to animals	Pyrrolizidine alkaloid	Sores: not specified	11, 49, 103
55.	Sterculiaceae <i>Sterculia setigera</i> (Karay gum tree)	Kukkuki (H) Boboli (F) Kokongiga (N) Eso funfun (Y)	Stem bark	Dried stem bark is mixed with feed and administered to animals	Tannins, rhamnase, galacturonic acid	Wound, ulcer, astringent	49, 103
56.	Anacardiaceae <i>Sclerocarya birrea</i> (Marula)	Danya (H) Edi (F) Jinjere goyi (N)	Dried stem bark	Decoction is given to animals	Tannins	Dystentery, diarrhea, astringent	11, 49, 104
57.	Caesalpiniaceae <i>Cassia alata</i> Syn: <i>Senna alata</i> (Craw plant)	Okpo (I) Gungoraoko (N) Asunwon (Y)	Flower, leaves	Powdered plant mixed with feed; Decoction is given orally	Glycoside, saponin, Azulene, tannin, guanine, resins, flavonoid, chrysoparic acid	Mycoses, bacterial infections	49, 104
58.	Verbenacea <i>Lippia adoensis</i> (Tea bush)	Aalali (F)	Flowers; cause photo dermatosis in cattle.	The powder is mixed with feed.	Linalool	Black quarter, pasteurellosis	49, 104
59.	Rosaceae	Nymyarnge	Leaf	The powder is		Black leg	49, 104

	<i>Rubus fellatae</i> (Guinea Fula-pulaar)	(F)		applied to wound topically			
60.	Rosaceae <i>Solanum aculaestrum</i> (Poison apple)	Gitae naii (F)	Leaf	The powder is applied topically	Solasodine	Dermatophylosis	49, 104
61.	Meliaceae <i>Khaya anthotheca</i> (White mahogany)	Kahi (F)	Stem bark	The powder is mixed with feed	Triterpenoids	Heamaturia, dermatophilosis, babesiosis, fascioliasis, scours	49, 104
62.	Hypericaceae <i>Psorospermum guinensis</i>	Sowoiki (F)	Stem bark	The moist powder is topically	Tannins, xanthones, anthraquinones	Dermatophilosis	49, 104
63.	Sapindaceae <i>Opaulinia pinata</i> (Timbo)	Shedewoi (F) Yatsubiyar (H) Kakanchela (N) Kakasela (Y)	Leaves juice	Juice or decoction is administered orally	Alkaloids, saponins, tannins, inulin	Pasteurellosis	49, 104
64.	Asteraceae <i>Laggera pterodonta</i>	Bowogolhi (F)	Roots	Infusion is given to animals	Eudesmane, pterodontoside A & B	Pasteurellosis	49, 103, 104
65.	Celastraceae <i>Maytenus senegallensis</i> (Confetti tree; Red spike thorn)	Tultulki (F) Namijin tsada (H) Shepolohun (Y) Kukukamma n (N)	Roots	Grind into powder and mix with feed	Maystansine, flavonol, wax	Pasteurellosis	11, 49, 103, 104
66.	Apocynaceae <i>Carissa edulis</i> (Natal plum)	Beiboni (F)	Roots	Ground into powder and mix with feed	Alkaloids, sterols, resin	Pasteurellosis	49, 104
67.	Liliaceae/Aliaceae <i>Allium cepa</i> (Onion)	Albasa (H) Alubosa (I) Luba (N) Alubosa (Y)	Bulbs	Decoction is administered to affected animals	Sulphur, riboflavin, allicin, alliin, alliinase,	Pasturellosis, cowdriosis	11, 49, 103, 104
68.	Loranthaceae <i>Englerina gabonensis</i> sub <i>sp. gabonensis</i>	Store socooiki (F)	Leaves	Decoction is used to wash the lesions		Foot-and-mouth disease	49, 103, 104
69.	Loranthaceae <i>Globimatula globiferus</i> var. <i>letuzeyi</i> (Mistletoe)	Store peluwahi (F)	Leaves, roots	Decoction is given orally and applied topically		Foot-and-mouth disease	49, 104
70.	Loranthaceae <i>Tapinathus globiferus</i> sub <i>sp. Letuzehi</i>	Store bawshihi (F)	Root	Powder applied to lesions	Hydrogen cyanide oxalate, tannin, calcium, phosphorus	Foot-and-mouth disease	49, 104
71.	Loranthaceae	Store karchi	Root	Decoction is	Hydrogen	Foot-and-mouth	49, 104



	<i>Tapinathus globiferus</i> sub sp. <i>Apodanthus</i> (Sprague)	(F)		given to animals	cyanide, oxalate, tannin, potassium, magnesium, calcium, phosphorus	disease	
72.	Lamiaceae <i>Ocimum lamifolium</i>	Liollebei ladde (F)	Leaves	Decoction is given to animals	Oil, eugenol	Cowdriosis	11, 49, 103, 104
73.	Labiatae <i>Hemizigia welwitachi</i>	Dutalhi(F)				Cowdriosis	49, 104
74.	Fabaceae <i>Pericopsis laxiflora</i> Syn: <i>Afromasia Laxiflora</i> (Mosquito bush)	Makarto (H) Shedu (Y) Abuaocha (I) Konkotirochi (F) Kpakangichi (N)	Roots, barks	Decoction is administered orally to affected animals	Angolensin, 2-0-methylangolensin, tannin	Cowdriosis	11, 49, 103, 104
75.	Leguminosae <i>Adenocarpus mannii</i>	Nannani (F)	Root	Decoction is given to animals	Flavone-C, flavonones, isoflavone	Cowdriosis	49, 104
76.	Anacardiaceae <i>Pseudospondias microcarpa</i> (African grape)	Lillahi (F) Jillahi (F)	Root	Infusion or decoction is administered	Alkaloid, tannins, terpenoids, hethrosides	Brucellosis, babesiosis, haematoria	49, 104
77.	Arahiaceae <i>Sheflera abyssinica</i> (Ethiopian plant)	Ifoyaahi (F)				Brucellosis,	49, 104
78.	Rutaceae <i>Citrus limon</i> (Lemon)	Lemuhi (F)	Fruits, leaves	Decoction is administered to affected animals	Volatile oil	Brucellosis,	11, 49, 102, 104
79.	Rubiaceae <i>Crossopteryx febrifuge</i> (Coffee senna)	Rimajogoohi (F) kasfiya (H) Nambisunsun (N) Syeye (Y)	Twigs, leaves	Decoction administered orally; bath the affected of scabies	Crossoptine, pholobaphene, phytosterol, glycoside; B-quinovine	Scabies, Brucellosis, babesiosis, haematuria	11, 49, 103, 104
80.	Mimosasae <i>Dichrostachys glomerata</i> ; <i>Dicostachys unerea</i> (Cow thorn)	Barli (F) Dundu (H) Amiogwu (I) Ekannanko (N) Kara (Y)	Root	Decoction is given to affected animals	Tannins, alkaloids	Ringworm, kata, fascioliasis, rinderpest,	49, 104
81.	Caesalpiniaceae <i>Piliostigma thonningii</i> (Thonning's piliostigma)	Kalgo (H) Okpoatu (I) Bafin (N) Abafe (Y) Barkehi (F)	Root	Decoction is administered to animals	Alkaloids, tannins	Ringworm, scours, fascioliasis	11, 49, 103, 104
82.	Euphorbiaceae <i>Bridelia ferruginea</i>	Budduudi (F)	Root	Decoction applied	Alkaloids, anthraquinone,	Ringworm, scours	11, 49, 103

				topically powder mixed with feed	flavonoids, tannins, cardiac glycoside saponins		
83.	Combretaceae <i>Terminalia glauscens</i> Syn: <i>T. schimperina</i> (Violet tree; Rhodes tree)	Bawshishi (F) Baushe (H) Edo (I) Kpace, (N) Igiotan (Y)	Stem bark, root bark	Decoction given to animals.	Tannins alkaloids	Ringworm, fascioliasis	11, 49, 103, 104, 135
84.	Fabaceae <i>Desmodium velutinum</i> (Velvet-leaf; Desmodium)	Takkamani (F) Dankadafi (H) Labalabangi (N) Emo, eeno (Y)	Whole of the shoot	Decoction with potash given to animals	Resins, tannins, flavonoids, saponins, glycosides	Abortion	11, 103, 104
85.	Asteraceae <i>Bidens pilosa</i> (Beggartick)	Bitachi (F)	Roots, leaves	Decoction is given during labour	Okanin aesculatin, amyryrin, cardinal aurone, amyryrin	Abortion infertility	103, 104
86.	<i>Englerina onchroleuca</i> (Crooked false medlar)	Store bumenahi (F)	Leaves	Decoction or infusion is given	-	Abortion infertility	49, 103, 104
87.	Rubiaceae <i>Oldelandia herbaceae</i> (Slender oldelandia)	Saarmalci (F)	Leaves	Infusion is given during abortion	Ursolic acid, kaempferols hexacosanes	Abortion infertility	49, 103, 104
88.	Papilionaceae <i>Pterocarpus erinaceus</i> (African teak)	Bannuli (F) Madobiya (H) Ageega (I) Zanchi (N), apepe (Y)	Stem bark, leaves	Powder is mixed with feed and given to animals	Alkaloids, tannins resins	Babesiosis, haematuria	11, 49, 103, 104
89.	Combretaceae <i>Anogeissus leocarpus</i> (Axle wood tree)	Kojoli (F) Marike (H) Atara (I) Kukundu (N) Ayin (Y)	Roots, stem bark	Decoction is given to affected animals	Flavonoids, gallic and ellagic acids, tannins	Scours, helminthosis tuberculosis	11, 49, 104
90.	Fabaceae <i>Indigofera suffruticosa</i> (West Indian indigo)	Poldi (F)	Roots, stem bark	Decoction is given to affected animals	Flavonoids, gallic and ellagic acids, tannins	Scours, helminthosis tuberculosis	49, 104
91.	Graminae/Poaceae <i>Echinochloa pyramidallis</i> (Antelope grass)	Bililliyawoi (F) Sabe (H) Kabadoko (N)	Whole plant	Decoction is used to wash the affected udder	Flavonoids, tannins, sterols & resins	Mastitis	11, 49, 104
92.	<i>Lagera peridonta</i>	Bowoghlhi (F)	Leaves	Decoction is	-	Mastitis	

				given			
93.	<i>Guinea altissima</i>	Gadaal doroji	Roots	Udder is washed with decoction	-	Mastitis	49, 104
94.	Fabaceae <i>Dalbaergia lacteal</i>	Balechi (F)	Leaves	Decoction is given		Mastitis	49, 104
95.	<i>Urelytrum digitata</i>	Nikiti (F)	Leaves	Decoction is administered orally	-	Fascioliasis	49, 104
96.	Combretaceae <i>Terminalia mollis</i>	Bawshishi (F)	Leaves	Decoction is given	Pumcalgin freedelin, catechin, epicatechin, galocatechin, epigallocatechin	Fascioliasis	49, 104, 136
97.	Asteraceae <i>Erigeron floribundus</i>	Katcatnegelhi (F)	Roots	Infusion is given orally	Flavonoids, saponins, tannins	Fascioliasis	49, 104
98.	Compositae/Asteraceae <i>Vernonia guinensis</i>	Ibbilis	Leaves	Decoction is given orally	Matairesinol, dibenzylbutyrolactol, deodarin, deodardion, cedeodarin	Fascioliasis	49, 104
99.	Pinaceae <i>Cedrus deodara</i> (Deodar)	-	Oil	Oil is rubbed the affected part	-	Psorptic, mange	49, 104
100.	annonaceae <i>Annona squamosa</i> (Sugar apple)	-	Seeds	The powder is mixed with water and applied topically	Anonaine, roemerine, noreoridine, corydine, norisocorydine, isocorydine, glauline	Pediculosis	31, 42, 103, 104
101.	Leguminosae <i>Tephrosia vogellii</i> (Fish bean)	Jimfaa (H)	Seeds	The powder with water applied topically	Tephrosin, isotephrosine degueline, rotenone	Pediculosis	42, 103
102.	Anacardiaceae <i>Anacardium occidentale</i> (Cashew)	Kashew (H) Kausu (I) Kashiwu (N) Kaju (Y)	Gum, shell, nut oil	Oil and powder red shell applied topically	Tannins, cardol, sitosterin, phenols, galic acid	Pediculosis, lousiness	31, 42, 103
103.	Balanitaceae <i>Balanites aegyptiaca</i> (Soap berry tree)	Aduwaa (H) Aduwa (N)	Kernel oil	Rubbed the affected part	Disogenin, yamogenin zachum oil	Pediculosis, lousiness	11, 49, 102 – 104
104.	Malvaceae <i>Sida carpinifolia</i> (Common wire weed)	-	Leaves	Applied decoction topically	Flavonoids	Skin parasites infections.	31, 42, 49, 104
105.	Euphorbiaceae <i>Euphorbia deightonia</i>	Tinya (H)	Leaves roots	Applied the infusion and decoction topically	-	Pediculosis, tick infestation, mange	31, 42, 104

106.	Anacardiaceae <i>Spondias mombin</i> (Hog plum)	Tsadar masar (H) Jinkara (I) Jinjirechi (N) Akika (Y)	Leaves, seeds, stem bark	Decoction is given to the affected animals	Geraniin, gerannin galloygeranin tannins	Coxsackie B <sub>2</sub> and Herpes simplex type 1 viruses	31, 42, 49
107.	Asclepiaceae <i>Calotropis procera</i> (Sodom apple)	Tunfafiya (H) Epuko (N) Bomubomu (Y)	Root bark	Decoction is given to affected animals	Calotropin, calotoxin uscharin usharidin, Mudarin	Colibacillosis, shigellosis, gonorrhoea, salmonellosis	11, 49, 103, 104
108.	Boraginaceae <i>Heliotropium indicum</i> (Wild clary)	Kalkashin kirama (H) Etigulu (N) Ogbe-akuko (Y)	Wilde plant	Infusion or decoction administered to animals	Indicine –N- oxide, saponin, tannin, alkaloids	Helminthosis	11, 49, 103, 104
109.	Caesalpinaceae <i>Berlinia bracteolosa</i>	Apado (Y) Banborochi (N) Dokarrafi (H) Ububa (I)	Stem bark	Infusion is given to pregnant animals at term	Inulin, tannin, saponin	Dystocia	11, 31, 42, 103
110.	Caesalpinaceae <i>Daniellia oliveri</i> (Ilorin balsam)	Maje (H) Ozabwa (I) Danchi (N) Iya (Y)	Stem bark	Decoction is administered orally to affected animal	Alkaloids, tannins, gum, essential oil	Snake bite	11, 31, 42, 49, 85, 103, 104
111.	Melastomataceae <i>Heterotis rotundifolia</i> (Svenska)	Edingibata (N) Dogunrasin (Y)	Whole plant, root	Decoction is given to affected animals	Inulin, saponin, tannins, manganese	Peste-despetit, trypanosomosis, runderpest	11, 104
112.	Mimosasae <i>Entada africana</i> (Viffa)	Tawatsa (H) Ogurube (Y) Kawonuwanchi (N)	Roots	Infusion or decoction is administered orally: Powdered is mixed with water and placed on wound	Paucine, tannins, retenone saponins	Dystocia wound	11, 31, 42, 49, 104
113.	Polygalaceae <i>Securida longepedunculata</i> (Violet tree)	Jechi (N) Ofoo (Y) Sanya (H)	Roots, stem bark	Decoction is given to affected animals	Saponins, oleanoic acid, valerianate methy salicylate	Tuberculosis, dystocia	11, 49, 85, 103, 104
114.	Pedaliaceae <i>Sesamum indicum</i> (Sesame)	Ridi (H) Beni (I) Nimbolo (N) Ekukugogoro (Y)	Whole plant	Juice of fresh plant is given to animal	Sesamol, mucilage, glycerin, esters	Tick infestation, dystocia	11, 49, 104
115.	Papilionaceae <i>Mucuna pruriens</i> (Cowitch)	Sansani (H) Ufe (I) Yerenkpe (N)	Hairs	Hair decoction is given orally	Mucunine, mucunadine	Helminthiosis	11, 49, 103

		Werepe (Y)					
116.	Papilionaceae <i>Lonchocarpus cyanescens</i> (Africa Indigo)	Malomo (H) Echin (N) Blu-yoruba (Y)	Root	Fresh root is infused and given to affected animals	Berberine pritolpine	Fascioliasis	11, 49, 104
117.	Moringaceae <i>Moringa oleifera</i> (Benoil tree)	Zogali (N) Ewelgbale (Y) Zogalli (H) Okwe-oyibo (I)	Leaves, stalks	Decoction is given to animals during labour	Moringine, minerals, protein, vitamin	Dystocia	11, 49, 103, 104
118.	Fabaceae <i>Centrosema pubescens</i> (Spurred butterfly pea)	-	Leaves	Supplemented in feed	Saponins, tannins, terpenes	Promotes growth	49, 104
119.	Composite/Asteraceae <i>Tridax procumbens</i> (Tridax)	Igbalode (Y) Biyenna blu (N)	Leaves	Feed supplement	Tannins, steroids, alkaloids, purines	Promotes growth	11, 49, 104
120.	Portulacaceae <i>Talinum triangulare</i> (Water leaf)	Ofe-bake (I) Eningi (N) Gbure (Y)	Leaves	Feed	Steroidal saponins	Promotes growth	49, 104
121.	Amaranthaceae <i>Amaranthus spp</i>		Leaves	Feed supplement		Promotes growth	11, 49
122.	Curcubitaceae <i>Telfaria occidentalis</i> (Fluted pumpkin)	-	Leaf extract	Feed supplement	Iron, thiamine, riboflavin, nicotinamide, ascorbic acid	Promotes growth	49, 103, 104
123.	Cucurbitaceae <i>Mormodica charantian</i> (Wild melon)	-	Fruits	Decoction powder is administered	Momordin, charatin, momodia, vicin, oils	Bacterial, viral and fugal infections	31, 32, 49, 104
124.	Moraceae <i>Ficus exasperata</i> (Sand paper leaf)	Baure (H) Aseba (I) Kawusa (N) Ipin (Y)	Leaves	Decoction applied topically to the affected birds	Copper, calcium, ascorbic acid, saponin, alkaloid, phytate	Fowl fleas	49, 104, 135
125.	<i>Musonia altissima</i>	-	Leaves	Ground and mix with feed	-	Promotes growth	49, 104

620 Keys: Nupe (N), Igbo (I), Yoruba (Y), Hausa (H), Fulfulde (F), - = No information

621

622 Table 2: Tropical plants that are used to treat poultry diseases in Nigeria

S/No.	Scientific, generic, species and English name(s)	Vernacular names	Part(s) used	Therapeutic regimens(s)	Phytochemical principles	Animal disease(s)	References
1.	Canabaceae <i>Cannabis indica</i> (Indian hemp)	Niyiwiyi (N)	Leaves	The leaves are soaked in drinking water	Tetrahydroxy cannabinol, cannabigerol, cannabidiol	Newcastle disease	11, 102
2.	Solanaceae <i>Datura metel</i> (Thorn apple)	Zakami (H) Myaramuo (I) Finiga (N) Apaka (Y)	Fruits	The fruits are soaked in drinking water	Atropine, hyosiyamine, scopolamine triterpenoids	Newcastle disease	11, 49, 103, 103, 140
3.	<i>Mush not</i>	-	Fresh or dried aerial part	Is given to affected birds to eat	-	Newcastle disease	49, 104
4.	Solanaceae <i>Solanum spp</i>	Gautan kadangare (H)	Fruits	Place the fruit in the drinking water of birds	Solanine	Newcastle disease	49, 104
5.	Solanaceae <i>Solanum incanum</i> (thorn apple; Bitter apple)	Gautan kura (H)	Fruits	Put the fruit in the drinking water	Solanine	Newcastle disease	49, 104
6.	Solanaceae <i>Solanum nodiflorum</i> Syn: <i>Solanum americanum</i> (Small flower night shade)	Gautan kaji (H) Nakw kunya (G)	Fruits	Put the fruit in for drinking	Solanine	Worm infestation, Newcastle disease, coccidiosis, fowl cholera	49, 104, 124
7.	Solanaceae <i>Capsicum frutescens</i> (Chilly pepper)	Barkono (H) Yakayiringo (N) Ataibile (Y)	Fruits	The powder of <i>C. frutescens</i> and <i>C. annum</i> are put in drinking water	Capsaicin, oil, ascorbic acid	Newcastle disease	11, 102 – 104
8.	Leguminosae <i>Abrus precatorius</i> (Jecquirity bear)	Idon zakara (H), Eyekosun dangiy (N) Ojologbo (Y) Otoberebere (I)	Seeds	Soaked in drinking water (very toxic)	Abrin, abrine, abricin, abricine methocation, picatorine, trigonelline choline, hypaphorine	Infection of <i>E. coli</i> , egg production and hatch ability, <i>S. typhi</i> , <i>K. pneumonia</i>	79, 84, 87, 88, 103, 104
9.	Solanaceae <i>Capsicum annum</i> (Bell pepper)	Atarugu (H) Ose (I) Yakako (N) Atatatase (Y)	Fruits	The powder of <i>C. frutescens</i> and <i>C. annum</i> are put in drinking water	Capsaicin	Newcastle disease	11, 31, 42, 103, 104
10.	Bombacaceae <i>Adansonia digitata</i> (Baobab)	Kuka (H) Muchi (N) Oshe (Y), Akpu (I)	Fruits	Powder mixed with feed	Catechins, adansonine	Fowl cholera	11, 103, 104

11.	Liliaceae <i>Allium sativum</i> (Garlic)	Tafarnuwa (H)	Bulbs	Soaked in drinking water	Alliin, allicin, sulphur, allinase	Fever	11, 49, 103
12.	Agavaceae <i>Aloe barteri</i> Syn: <i>Aloe vera</i>	Moda (H)	Leaves	Soaked in drinking water	Alion, barterin	Respiratory problems	11, 31, 42
13.	Combretaceae <i>Anogeissus schimperi</i> (Citrus)	Marke (H)	Bark	Soaked in drinking water	Flovonoids tannins	Cough, gastro intestinal disorders	31, 42, 104
14.	Fabaceae <i>Arachis hypogea</i> (Ground nut)	Gyada (H) Gusha (N) Apapa (I) Epa (Y)	Oil	Oil is given to the pomed birds to drink	Oils	Poisoning	11, 103, 104
15.	<i>Banderaea simplicifolia</i> (Abelia bread)	-	Leaves	Decoction or infusion used to bathed animals	-	Pediculosis	49, 104
16.	Caesalpiniaceae <i>Bauhinia rufescens</i> (Scutch grass)	Tsatsafi (H)	Barks	It is soaked in water	-	Hepatitis	49, 104
17.	Caesalpiniaceae <i>Bauhinia thonningii</i> (Camel's foot)	Kalgo (H)	Juice from young leaves	Is dropped in the affected eye	-	Conjunctivitis	11, 31, 42, 103
18.	Burseraceae <i>Boswselia dalziellii</i> (Frankincence)	Hannu (H) Gogagi (N)	Juice, stem bark, leaves	Juice or decoction from stem bark and fresh leave is given to birds	Resin, boswellinic acid, essential oil bassorin	Coccidiosis, diarrhea, amoebiasis	11, 31' 42, 498
19.	Solanaceae <i>Capsicum annum</i> (Bell pepper)	Ata (H) Ose (I) Ata rubu (N) Ata tatase (Y)	Fruits	Soak the fruits in drinking water	Capsaicin	Cholera	11, 49, 103
20.	Solanaceae <i>Capsicum frutescens</i> (Chillies)	Barkono (H) Yakayiringi (N) Ataibile (Y)	Fruits	Dried powdered fruits soaked in drinking	Capsaicin	Cold, diarrhea, Newcastle disease	11, 31, 42, 49, 103
21.	Caricaceae <i>Carica papaya</i> (Guava)	Gwanda (H) Okwere (I) Konkeni (N) Ibepe (Y)	Leaves	The moist ash of burnt leaves applied topically to lice	Cryptoxanthine, papain, palmitic, oleic, stearic, linoleic acid	Pediculosis	11, 103, 104
22.	Rutaceae <i>Citrus aurantifolia</i> (Lime)	Lemon tsami (H)	Juice	Juice and smoke from the dried peel burnt: lemon juice mixed with butter and given to birds. Juice and red potash mixed	Flavoniods, volatile oils, vitamin C	Cold nervous disorder, insect repellent, Helminthosiss	11, 31, 42, 85, 102-104, 135

				with drinking water			
23.	Cucurbitaceae <i>Cucumis pustulatus</i>	Makaima (H)	Fruits	Fruits mixed with bran and given to birds	-	Prophylaxis, stunting growth, increase egg production	41, 49, 104
24.	Curcubitaceae <i>Cucumis prophetarum</i> (Balsam pear; Bitter guard)	Kanfakara (H)	Fruits	Combined fruits of <i>C. prophetarum</i> , <i>C. aurantifolia</i> , and <i>C. quadrangularis</i> used	-	Helminthosiss	31, 42, 49, 104
25.	Vitaceae <i>Cissus quadranguilaria</i> (Bone setter)	Dodoriya (H)	Fruits	Combinations above used	Vitamin C, 3-ketosteroid, steroid 1 & 11	Helminthosiss	31, 42, 104
26.	Cyperaceae <i>Cyperus articulatus</i> (Guinea rush)	Kajiji (H) Efakozhiko (N) Eni-oore (Y)	Fruits	Fruits of <i>C. articulatus</i> and seeds of <i>diglomerata</i> are ground and given	Sesquiterpenes, monoterpene	Musculoskeletal disorders, fever, poor growth	11, 49, 103, 104
27.	Amaryllidaceae <i>Crinum yaccaeflorum</i>	Albasan kwadi (H)	Leaves	Leaves of <i>C. yaccaeflorum</i> with bulbs of <i>A. sativum</i> infusion given	-	Musculoskeletal disorders	31, 42, 49, 104
28.	Mimosaceae <i>Dichrostachys glomerata</i> Syn: <i>Dichrostachys cinerea</i> (Sickle bush)	Yayan dundu (H)	Seeds	Combined as stated above	Tannins, alkaloids	Musculoskeletal disorders, fever, poor growth	31, 42, 104
29.	Palmae <i>Elaeis guineensis</i>	Kwakwan manja (H) Aket (I) Ope (Y) Yikunu (N)	Oil	Oil is rubbed on the pox lesions	Lipids	Fowl pox	11, 31, 42, 49, 102-104
30.	Euphorbiaceae <i>Cuphorbia poissonii</i>	Tunya (H)	Latex	Latex is rubbed on sore, wound or any fresh cut	-	Sore, wounds	31, 42, 49, 104
31.	Ebenaceae <i>Disopyros mespiliformis</i> (West African Ebony)	Namijin kanya (H)	Barks	Dried bark is pounded and moistened with water and placed in wounds or brings	Naphtoquinone, plumbagin, tannin, saponin, scopolin	Wound, bruises	31, 49, 104
32.	Moraceae	Baure (H)	Latex	Latex is given	-	Diarrhea,	42, 49, 104,



	<i>Ficus gnaphalocarpa</i> (Bush fig)	Baure (F)		orally and applied topically		fungal infection	132
33.	Combretaceae <i>Guiera senegalensis</i> (Dama Gazelle)	Sabara (H) Sabara (N) Geloki (F)	Roots, leaves	Latex is rubbed topically	Tannins, alkaloids catechiians	Gastrointestinal disorders	11, 103
34.	Malvaceae <i>Hibiscus sabdariffa</i> (Jamaican Sorrel; Indian Sorrel)	Zoborodo (H) Emagidzuru (N) Akese (Y) Zoborodo (F)	Leaves	Leaves are burnt in poultry houses	-	Lice, tick, sked, mange flies infestation	11, 49, 85, 102-104
35.	Fabaceae <i>Indigofera spicata</i> Syn: <i>Indigofera hendecaphylla</i> (Creeping indigo)	Shuni (H)	Leaves	Paste is made with fresh water and applied topically	-	Lacerations, swellings	31, 42, 49, 104
36.	Meliaceae <i>Khaya senegalensis</i> (Mahogany tree)	Madachi (H) Ghyaghya (G) Kahi (F)	Barks	Decoction is made and given to birds	Limonoids, scopoletin, tannins, saponins, sterol	Coccidiosis, Emahation, amoebiasis, helminthosis, diarrhoea, Newcastle disease	11, 49, 103, 104
37.	Curcubitaceae <i>Lugenia vulgaris</i> (Bottle guard)	Kwarya hawainiya (H) Tumbugel (F) Bingi (N) Tangiri (Y)	Whole	The plant is dipped in drinking water	Alkaloids	Coccidiosis, Newcastle disease	11, 49, 103, 104
38.	Lythraceae <i>Lawsonia inermis</i> (Henna plant)	Lalle (H)	Leaves	Infusion or decoction is applied topically	Lawsonide, tannins, resin	Soft ticks, wounds, bruises	11, 49, 103
39.	Cucurbitaceae <i>Momordica balsamina</i> (African cucumber, Balsam apple)	Garafuni (H) Pylbi gwi (BR) Daddagu (H) Garafini (N) Igbole-aja (Y) Garahunii (F)	Leaves, juice	The powder is mixed with feed; mix juice with drinking water	Glutelon, albumin, globulin, aminobutyric acid	Coccidiosis, lameness, uropegeal gland inflammation in ducks, fowl pox	11, 31, 42, 49, 103, 104
40.	Solanaceae <i>Nicotiana rustica</i> (Aztec tobacco)	-	Leaves	The leaf powder or oral is applied topically	Nicotine	Tse- tse flies, lice, tick, mange mite infestations	42, 49, 104
41.	Mimosaseae <i>Parkia filicolidea</i> Syn: <i>Parkia biglobosa</i> (Niffa)	Dorowa (H) Ogirili (I) Lonchi (N) Iru, Igba (Y)	Bark	Bark is placed in drinking water	Tannins, saponins, alkaloids	Newcastle disease	11, 49, 103, 104
42.	Rubiaceae <i>Sarcocephalus</i>	Tafashiya (H) Gbashi (N)	Bark	Bark is placed in drinking	Naufoline, Augustine	Gastrointestinal	11, 49, 103

	<i>esculentus</i> Syn: <i>Nuclea latifolia</i> <i>Sarcocdphalus latifolia</i> (African peach)	Egbesi (Y)		water	tannin, saponine	disorders	
43.	Solanaceae <i>Schwenkia americana</i> (Baobab)	Dandana (H) Kabi-malam (N) Ojuisin (Y)	Leaves	Infusion or decoction is applied topically	Glycoside, schweikioside	Eye infection	42, 49, 104
44.	Polygalaceae <i>Securidaea longepedunculata</i> (Violet tree)	Sanya (H) Jechi (N) Kyiritoo (Y)	Roots	Decoction or infusion is given orally	Saponin, glycosides, oleanoic acid, tannins, valerianate methyl salicylate	Cold	11, 31, 42, 49, 85, 103, 104
45.	Bignoniaceae <i>Stereospermum kunthianum</i> (Kunth's Stereospermum)	Sansani (H) Jiri (H) Erumyeye (Y) Dagba panbochi (N)	Bark	Ash is given to birds	-	Poisoning	11, 49, 103, 104
46.	Compositae/Asteraceae <i>Vernonia amygdalina</i> (Bitter leaf)	Shiwaka (H)	Leaves	Infusion is given to bird; Root is toxic	Vernonin, vernolepin, vernomygdin	Diarrhea, worms infestation infections	11, 49, 83, 103, 104
47.	Fabaceae <i>Zornia diphylla</i> Syn: <i>Zornia glochichiata</i> (Umbrella sedge)	Sabulun salo (H) Ebayikan ego (N) Eti-ekute (Y)	Fruits	Steep in water and given to birds	-	Gastrointestinal disorder	11, 49, 103
48.	Annonaceae <i>Annona senegalensis</i> (Sour sop)	Gwandan daji (H) Uburu-ocha (I) Nigberechi (N) Labo (Y)	Roots	Decoction given orally; <i>A. senegalensis</i> , <i>K. senegalensis</i> and <i>V. amygdalia</i> roots can be decocted and give orally (Synergian)	Anonaine, tannins	Helminthosiss	11, 49, 103, 104
49.	Combretaceae <i>Combretum peniculatum</i> (Blood wort; Thousand leaf)	-	Roots	Decoction is given to birds	Alkaloids, tannins, flavonoids, phenols, saponins, steroids	Salmonellosis caused by <i>S. pullorum</i> and <i>S. gallinarum</i>	49, 104
50.	Loranthaceae <i>Tapinanthus dodoneifolius</i> (Goat weed)	-	Leaves	Infusion or decoction is given to birds	Alkaloids, tannins, flavonoids	Salmonellosis caused by <i>S. pullorum</i> and <i>S.</i>	42, 49, 104

						gallinarum	
51.	Combretaceae <i>Terminalia avicenoides</i> (Grain of Salim)	-	Stem bark	Decoction with potash is given to birds	Arjunolic acid, $\alpha$ -amyrin, 2,3,23-trihydroxyolean-12-ene	Helminthosiss	42, 49, 104
52.	Liliaceae <i>Allium cepa</i> (Onion)	Albasa (H) Ghipa (G) Alubosa (I) Lubasaa (N) Alubosa (Y)	Bulbs	Sliced bulbs are dropped in drinking water. Green leaves are also given	Sulphur compounds, alliin, allocin, alliinase	Helminthosiss	11, 49, 102-104
53.	Vitaceae <i>Cissus polpunea</i> (Veld grape)	Dafara (H) Goloyi (G) Korolambawo (N) Ajawa (Y)	Leaves, roots	Powder leaf or root is put in drinking water	Alkaloids, flavonoids, saponins, tannins	Prophylaxis, coccidiosis	11, 49, 103
54.	Arecaceae <i>Dentel betel</i> (Areca nut; Betel nut)	Hankatayaro (H)	Fruits	Fruits are sliced and put in drinking water for birds	Chavibetol, chaicol, estragole, eugenol, cadinene, -lactone, ursolic acid, cadinene, carvacrol	Fowl typhoid coccidiosis, prophylaxis	42, 49, 104
55.	Moringaceae <i>Moringa oleifera</i> Syn: <i>Moringa pterygosperina</i> (Moringa tree)	Zogale (H) ladignayi (G)	Bark, root bark	Soak stem or root bark in drinking water	4 hydroxymellein, sitosterone, $\beta$ -sitosterol, oclacosanoic acid, vitamins, behenic, lignoceric, myristic acids, ptergospermin, vamillin	Helminthosiss, prophylaxis	11, 49, 103, 104
56.	<i>Nauclea latifolia</i> Syn: <i>Sarcocephalus latifolia</i> (Pin cushion tree)	Tafashiya (H) Kutugbarayi (G)	Stem, root bark	Soak stem or root bark in drinking water for birds	Saponins, flavonoids, alkaloids, tannins, cyanide, phylate, oxalate	Helminthosiss	11, 49, 103
57.	Scrophulaceae <i>Striga hermontheca</i> (Witch weed)	Makasa (H) Gogai (G) Edo (N)	Whole plant	Pound and mix the whole plant with drinking water	Flavonoids, tannins, saponins, cardioglycosides, terpenes, sterols, alkaloids, coumarins	Coccidiosis, dysentery, prophylaxis	11, 49, 103, 104
58.	Verbenaceae	Dinya (H)	Leaves	Cooked leaves	Aryl glycoside	Coccidiosis,	11, 49, 103

	<i>Vitex dioniana</i> (Blackplum)	Jiyi (G) Dinchi (N) Oriri (Y)		with cereals given every day for 3 weeks		prophylaxis	
59.	<i>Epiphyllum truncatum</i> (Cactus)	Magabai (G)	Stem	Stem cut into drinking water	-	Newcastle disease, Coccidiosis,	49, 103
60.	Sapotaceae <i>Butyrospermum paradoxum</i> Syn: <i>Vitellaria paradoxa</i> (Shea butter tree)	Kade (H) Koyi (G) Osisi (I) Ori (Y) Kochii (N)	Barks	Drop fresh bark in drinking water	Fixed oils, alkaloids	Coccidiosis, fowl pox	11, 31, 42, 49, 103, 104
61.	Caesalpiniaceae <i>Azelia africana</i> (Counter wood tree; Mahogany bean)	Kawo (H) Akpald (I) Bachi (N) Apa (Y)	Leaves	Infusion or decoction given to birds	Alkaloids, tannins	Helminthosi s	11, 49, 103, 104
62.	Bombacaceae <i>Adansonia digitata</i> (Baobab tree)	Kuka (H) Akpu (I) Muchi (N) Oshe (Y)	Root	Decoction is given for drinking	Adansomine, catechina, flavonoside, ascorbic acid	Coccidiosis	11, 49, 103, 104
63.	Meliaceae <i>Azadirachta indica</i> (Neem tree)	Niimu (N) Dogon yaro (I) Dogonyaro (H) Wahe (F) Okeoyinbo (Y)	Leaves	Decoction is given to birds	Azadirachta, nimbin, nimbolide, salanine meliacin	Helminthosi s	11, 49, 103, 140
64.	Rhamnaceae <i>Parinary polyandra</i> Syn: <i>Maranthes polyandra</i>	Kura (H)	Leaves	Decoction is given in drinking water	Phosphorus, calcium, magnesium, potassium	Coccidiosis	31, 42, 49, 104
65.	Anacardiaceae <i>Mangifera indica</i> (Mango)	Mangoro (H) Mangolo (I) Mungoro (N) Mangoro (Y)	Roots	Roots soaked with salt is given	Quercetin, resins, tannins, vitamins A, B & C complex	Helminthosi s	11, 42, 49, 103, 104
66.	Annonaceae <i>Annona squamosal</i> (Sugar apple)	Kiribombo (N)	Seed	The powder is mixed with water and applied topically	Acrid principle, anonaine, roemerine, noreorydine, corydine, norisocorydine , isocorydine	Pediculosis, insect infection, cancer	11, 49, 104
67.	Leguminosae <i>Tephrosia vogellii</i> (Fish bean, Fish poison bean)	-	Seed	The powder is mixed with water and applied topically	Tephrosin, isotephrosin	Pediculosis	11, 49, 104
68.	Apocynaceae <i>Adenium obesum</i> (Desert rose)		Leaf	The decoction applied topically	-	Tick infestation	49, 104

623 Keys: Hausa (H), Nupe (N), Gwari (G), Fulfulde (F), Yoruba (Y), Baribari (BR), Igbo (I),  
624 - = Unknown  
625

626 Table 3: Tropical plants that are used to treat small animal diseases in Nigeria

S/No	Scientific aqueric specie names	Vernacular names	Part(s) used	Therapeutic regimen	Phytochemical principles	Animal disease(s)	References
1.	Brassicaceae <i>Brasica juncea</i> Syn: <i>Brassica nigra</i> (Mustard)	-	Oil	The oil is rubbed in affected part	Allyl mustar oil, crotonyl mustard oil, allyl cyanide, dimethyl sulphide	Psoroptic mange	31, 46
2.	Palmae <i>Elaeis guinensis</i> (African oil palm)	Kwakwa (H) Ake (I) Yikunu (N) Ope (Y)	Oil	The oil is rubbed in affected part	Lipids	Psoroptic mange	11, 49, 102, 103
3.	Rutaceae <i>Citrus aurantium</i> (Lime of Mecca, (Lago mahogany, African mahogany)	Lemuhi (F) Lemun makka (H) Lemun nasara (N)	Fresh peels	The oil of <i>E. guinensis</i> is rubbed followed by rubbing of fresh peels.	Vitamin C	Psoroptic mange	11, 49, 103
4.	Meliaceae <i>Khaya ivorensis</i>	-	Oil	The oil from the seed is rubbed in affected part.	Anthocyanins, flavonoids, steroids, tannins, phlosatanins anthraquinones saponins	Mange, dermatophylosis	49, 104
5.	Malvaceae <i>Sida carpinifolia</i>	-	Leaves		-	Skin parasitic infections	49, 104
6.	<i>Butyrospermum paradoxum</i> (Shear butter tree)	Kadanya (H)	Nuts	Nuts are burnt and the smoke repel insects	Oil	Insect infestation	11, 49, 103, 104
7.	Burseraceae <i>Canarium schwaeforthi</i> (False walnut)	Atile (H) Mbiji (I) Esha (N) Origbo(Y)	Wax	Wax is rubbed and repel insects	Saponins, resins, tannins, amyrrin, limonene, phellandrine	Insect infestation	11, 42, 49, 103, 104
8.	Combretaceae <i>Guiera senegalensis</i> (Egyptian Minosa)	Sabara (H) Sabara (N)	Leaves, twigs	Leaves and twigs are burnt and the smoke repel insects	Catechina, alkaloid, tannins	Insect infestation	11, 49, 94
9.	Lamiaceae <i>Hyptis specitigera</i> (Bush mint; Black	-	Whole plant	Whole plant is burnt and smoke repel	Oil	Insect infestation	31, 49

	sesame)			insects			
10.	Rutaceae <i>Citrus aurantifolium</i> (Sour orange) (sour lime)	Lemun tsani (H) Afofanta (I) Lemun bakogi (N) Orombowewe (Y)	Peels	Dried peels are burnt and the smoke repel insects	Flavonoids, vitamin C, essential oils	Insect infestation	49, 94, 103
11.	Mimosaceae <i>Sosbaria aculeate</i> (Niffa)	Alambu (H)	Leaves	Infusion of pounded leaves repel tsetse fly		Tsetse fly infestation	42, 49, 104
12.	Bombacaceae <i>Adansonia digitata</i> (Baobab tree)	Kuka (H) Akpu (I) Muchi (N) Oshe (Y)	Leaves	The leaves are burnt and the smoke repel insects	Adansomine, catechins, ascorbic acid	Insect infestation	11, 49, 102, 103, 104
13.	Fabaceae <i>Amblygonocarpus andongensis</i> (Iron wood)	Kolon itche (H)	Stem bark	The powder decoction is given to obese rats	Alkaloids, saponins, cardiac glycosides	Obesity	35, 49, 104
14.	Curcubitaceae <i>Curcumis sativus</i> (Cucumber)	Kokumba (N) Kokunba (H)	Fruits/seeds	Decoction is given to lab animals to drink	Iron	Anaemia, constipation	49, 86, 103, 104
15.	Papilionaceae <i>Abrus precatorius</i> (Jecquirity bean)	Idon Zakara (H)	Leaves, leaf and seeds are toxic	Decoction is given to affected rodents;	Abrin, abrine, abricin, abricine	Malaria, anaemia	11, 49, 103, 104
16.	Meliaceae <i>Azadiradita indica</i> (Neem tree)	Niinu (N) Dogonyaro (H) Dogon yaro (I) Oke oyinbo (Y)	Leaves	Decoction is given to affected animals	Nimbin, salnin nimbolide, nimbidin, meliacine diterpenes	Malaria in rodents	9, 49, 102, 103, 140
17.	Labiatae <i>Ocimum basilicum</i> (Sweet basil)	Efirin (Y) Dagoya (H) Inchianwu (I)	Leaves	Infusion is used	Alkaloids, flavonoids, phenols, coumarins, tannins, saponins, phytosterols	Hypertension	11, 49, 103, 104
18.	Ganodomataceae <i>Ganoderma</i>	Tuwon biri (H)	Fruits	Decoction given to cat	Glycosides, saponins,	Inflammation	9, 49

	<i>lucidum</i> (Ganoderma)	Eyangici kana (N)			flavonoids, alkaloids		
19.	Malestomataceae <i>Dissotis theifolia</i> (Trailine Dissotis)	-	Stems	Methanolic extract is administered topically	Saponins, tannins, glycosides, flavonoids, terpenoids, alkaloids, steroids	Staphylococcal infection, wound	11, 49, 103,
20.	Lamiaceae <i>Ocimum gratissimum</i> (Basil fever plant)	Nehonwu (I) Efirin (Y) Tamotswagi wawaci (N)	Leaves	Methanolic extract applied topically	Thymol, eugenol, camphor, carryophylline	Wound antiseptic	11, 49, 103, 104
21.	Euphorbiaceae <i>Phyllanthus amarus</i> Stone brea	Alambu (H) Debi-sowo (Y) Sunyesboro sunzuma (N)	Whole plant	Aqueous extract is administered orally	Tannins, flavonoid, glycoside, inulin	Wound	11, 49, 104
22.	Icacinaceae <i>Pyrenacantha staudtii</i>	-	Roots	Aqueous extract administered orally	Glycosides, saponins, alkaloids, flavonoids	Ulcer	49, 104

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628 Keys: Hausa (H), Nupe (N), Gwari (G), Fulfulde (F), Yoruba (Y), Baribari (BR), Igbo (I),

629 - = Unknown

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