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Inventorying of herbal remedies used to control small ruminant's parasites in Southern Benin

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Abstract
A botanical survey was undertaken in two agro-ecological zones of southern Benin, aiming inventorying the plants used by farmers as antiparasitic remedies in small ruminants. In total, 253 smallholders of livestock have been sampled throughout 90 villages and underwent a structured interview. The result revealed that 20% of interviewed people use indigenous knowledge based on plants. Twenty two plants of 18 families have been cited as effective remedies to parasitic diseases of small ruminants. *Xanthoxylum zanthoxyloides* (Rutaceae) and *Carica papaya* (Caricaceae) were the most frequently cited(75% of plants users) followed by *Spondias mombin* (Anacardiaceae) and *Moringa oleifera* (Moringaceae). Leaves were the most frequently plant organ generally used in infusion (100%). Farmers think this medication is effective. Though widely reported, the effectiveness of these recipes still belongs to empirical knowledge awaiting proof.

Keywords: Plants, remedies, parasites, small ruminant, Benin.

INTRODUCTION

In Sub-Saharan Africa, environmental conditions are particularly favourable for viable colonies of parasite eggs and larvae. The control of animal parasites thus constitutes a major and constant challenge. In Benin, antiparasitic drugs represent 54% of veterinary medicines annually used [2], reflecting the importance of parasites control in animals as well as cost implication for poor small holders. The use of imported veterinary drugs is however not free of controversy. Numerous farmers complain of too expensive drugs, questionable quality of antiparasitic found in the market, possible resistances of parasites leading to greater use of the pharmacopoeia [5]. Scientists are also increasing their interest in the ethnoveterinary medicine aiming at availing alternative medication because of drug resistance developed by pathogens against conventional molecules [3, 4, 7, 8, 9 and 10]. In this regard, some ethnobotanical investigations have already been undertaken in Benin such as pest control plants used by breeders of Southern Benin [6]. With the assumption that indigenous knowledge remain poorly captured and that the mentality of farmers has evolved positively, this study was conducted in order to update the list of herbal recipes used by farmers and smallholders in two agro-ecological zones in southern Benin.

MATERIALS AND METHODS

Study design

The study was conducted from March to May 2012 and covered two agro-ecological zones (Table 1). This area is located in southern Benin. The climate is Guinean type with two rainy seasons (April to July, September to November) and the rainfall varies between 1000 and 1400 mm. The soils are lateritic, ferruginous or waterlogged. Populations are predominantly rural and live in various agricultural activities presented in Table 1. Traditional practices and animists (voodoo) are still vivid with some interesting aspects like hospitality and courtesy, two factors that have eased interviews in the study.

Table 1. Study area and major agricultural activities

Agro-ecological zones concerned	Municipalities concerned	Main agricultural activities			
		Crop production	Cattle	Sheep and goats	Other
Zone VI : Lateritic soil zone	Abomey-Calavi, Allada, Kpomassè, Tori-Bossito, Zè, Dogbo, Houéyogbé, Adjarra, Missérété, Avrankou, Sakété	Corn Cassava Cowpea Peanut	O	●	●
Zone VIII : Waterlogged zone	Athiémé, Grand-Popo, Comé, Lokossa, Sèmè-Podji, Dangbo, Adjohoun,	Corn Cassava Cowpea Vegetable crops	O	●	●
Legend : ● *Widely practiced* O *little practiced*					

Sampling began with identifying referenced localities of small livestock throughout villages. This step required the support of chiefs of village and the guiding of local veterinary officers. About 100 villages were then selected in 18 municipalities in the study area. The second step of the sampling consisted of systematic enrolment of any breeder with at least five small ruminants and who was available for interview. In total 253 interviews have been completed.

The investigator had to ascertain the pest control methods used by breeders. The interviews were conducted following the respondent desired pace. A structured questionnaire upon the

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problem of parasitic diseases in small ruminants served for the 253 interviews. Herbal recipes were the central subject and were given sufficient attention. The common names of mentioned plants and plant organs (root, leaves, bark or stems) usually used for each therapeutic indication were carefully recorded.

Botanical identification

Herbs listed in endogenous recipes for small ruminant's parasites control were collected with the help of those interviewed and then identified with botanical keys from the literature [1] and with the support of the National Herbarium staff at the University of Abomey-Calavi.

Statistical Analysis

The typology (herd sizes, pest control methods, bioactive plants quoted with frequency of quoting ...) of investigative units integrated into the database has been established through descriptive statistical analysis with the software Stata 11. Chi2 test was used for checking the degree of association between variables.

RESULTS AND DISCUSSION

The typology of investigated units is presented in Table 2. It shows that the surveyed units of production are mostly (97.2%) family types as reported by Hounzangbe-Adote [6] with straying animals and low zoo-sanitary monitoring. Awareness on animal parasites is quite strong even though its economic impact is not assessed. Nearly 17% of respondents do nothing against parasites. Surprisingly, our findings show that almost 63% of surveyed breeders use veterinary drugs and only 20% herbal remedies. Twenty one plants were cited and collected. Table 3 presents the inventory of plants involved in therapeutic recipes. If the efficacy of these plants were widely reported, all the evocated recipes remain very empirical and awaiting verification. Some of the plants have already been quoted in other ethnobotanical studies but for other indications. Djoueche et al. [5] reported that *Mitragyna inermis* were one of the most frequently used plant in Bénoué region of Cameroon. *Azadirachta indica* was reported as antipyretic and *Ocimum grattisimum* as anti-emetics. Among the plant organs, leaves were the most involved in recipes according to 100% of respondents. Leaves are generally used in infusion or decoction and administered orally.

Table 2. Characteristics of surveyed units

Variable	Categories	Number	%
Production unit	Household handling	246	97.23
	Farm handling	7	2.77
Herd size	≤ 10	134	52,96
	> 10	119	47,04
Pest control way	None	43	16,99
	Branded veterinary Drugs	159	62,85
	Plants and plant products	20	7,91
	Mixed	31	12,25

Table 3. Botanic of cited plants and their utilization

Scientific name [local name]	Family	F (%)	Organs used	Indication	Route of Administration
Xanthoxylum zanthoxyloides [Hètin]	Rutaceae	80	L	G.I.	Oral
Carica papaya [Kpintin]	Caricaceae	75	L and S	G.I.	Oral
Spondias mombin [Akikontin]	Anacardiaceae	40	L	G.I.	External
Moringa oleifera [Moringa]	Moringaceae	25	L	G.I.	Oral
Ficus exasperata [Ahloman]	Moraceae	20	L	G.I.	Oral
Vernonia [Amanvivè]	Asteraceae	15	L	G.I.	Oral
Gliricidia sepium [Kpatin]	Fabaceae	10	L	G.I.	Oral
Ocimum gratissimum [Tchiayo]	Lamiaceae	10	L	G.I.	Oral
Psidium guajava [Kinkun]	Myrtaceae	10	L	G.I.	Oral
Phyllantus amarus [Hinlinwé]	Euphorbiaceae	5	P	G.I.	Oral
Ocimum canum [Hissihissi]	Lamiaceae	5	P	G.I.	Oral
Jatropha curcas [Kpotoun]	Euphorbiaceae	5	L	G.I.	Oral
Chenopodium ambrosioides [Azongbidi]	Chenopodiaceae	5	L	G.I. and Ext.	Oral - External
Azadirachta indica [Kinini]	Méliaceae	5	L	G.I.	Oral
Cassia italica [Acassia winiwini]	Caesalpiniaceae	5	L	G.I.	Oral
Petiveria alliacea [Zoroman]	Phytolaccaceae	5	L	G.I.	Oral
Cucumis melo [Gninsikin]	Cucurbitaceae	5	L	Ext.	External
Harrisonia abyssinica [Tohè]	Rutaceae	5	L and B	G.I.	Oral
Trichilia prieuriana [Tchiviman]	Meliaceae	5	L	G.I.	Oral
Cajanus cajan [Klékun]	Fabaceae	5	L	G.I.	Oral
Ficus unibellata [Avloman]	Moraceae	5	L	G.I.	Oral
Mitragyna inermis [Linkpatin]	Rubiaceae	5	L	G.I.	Oral

F (%) = frequency of plants citation, L = leaves, P = whole plant, B = Bark, S = seeds, G.I. = gastrointestinal parasites, Ext. = external parasites

CONCLUSION

The use of herbal remedies in veterinary medicine is growing and is better suited to scientific assessments. This study established a list of 22 possible bioactive plants used in southern Benin for parasites controlling in sheep and goats. Further studies will be undertaken to establish efficacy and spectrum of these plants against parasites.

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