ETHNOBOTANY OF FIVE COMBRETACEAE SPECIES AMONG FOUR ETHNIC GROUPS IN FOUR VILLAGES OF WESTERN BURKINA FASO

Fidèle Bognounou¹*, Patrice Savadogo², Adjima Thiombiano¹, Per Christer Oden², Issaka Joseph Boussim¹, Sita Guinko¹

¹Université de Ouagadougou, Unité de Formation et Recherche en Sciences de la Vie et de la Terre, 03 B.P. 7021 Ouagadougou 03, Ouagadougou, Burkina Faso; * Corresponding author’s email: fidelebognounou@yahoo.fr
²Swedish University of Agricultural Sciences, Faculty of Forest Sciences, SE-901 83 Umeå, Sweden.
Introduction 1

• While plants have adapted to diverse habitats of the world through their physical and biochemical modifications, human populations have adapted largely through the generation and application of knowledge – both ecological and technological, practical and theoretical.

• Today, traditional societies throughout the world possess a wealth of such knowledge which they have accumulated during prolonged interaction with the natural world, and which remains fundamental to their physical, spiritual and social well-being.

• For while it has often been assumed that knowledge of a given traditional community is an essentially static, uniform body of shared information.
Introduction 2

• Recent research demonstrates that traditional knowledge is not only intrinsically dynamic, but that much of it is distributed according to specific social and personal factors.
• Many ethnobotanical studies with quantitative and qualitative approaches were done in Burkina Faso but there is little on the dynamics and distribution of ethnobotany knowledge.
• **Objective:** The present study sought to document ethnobotanical knowledge of four ethnic groups in four locations concerning five Combretaceae species in western Burkina Faso and to compare the utilization of these species.
• **Hypothesis:** We hypothesized that some socio-cultural factors, including ethnicity may have a profound influence on ethnobotanical knowledge distribution.
Study Method 1

• Belehede; main ethnic group: **Fulsé**; Species present: *A. leiocarpa*, *C. aculeatum* and *C. micranthum*.

• Ouahigouya; main ethnic group: **Mossi**; Species present: *A. leiocarpa*, *C. aculeatum*, *C. micranthum* and *C. nigricans*.

• Diouroum; Main ethnic group: **Samo**; Species present: *A. leiocarpa*, *C. aculeatum* *C. micranthum*, *C. nigricans* and *P. suberosa*.

• Pâ; Main ethnic group: **Bwa**; Species present: *A. leiocarpa* and *P. suberosa*.

Figure 1. Study sites location
Study Method 2

• We used the semi-structured surveys to collect qualitative data related to the ethnobotany knowledge and the utility evaluation of the five following Combretaceae species: *Anogeissus leiocarpa* (DC.) Guill. & Perr., *Combretum aculeatum* Vent., *Combretum micranthum* G. Don, *Combretum nigricans* Lepr. ex Guill. & Perr. and *Pteleopsis suberosa* Engl. & Diels

• These species are widespread all over the country and belong to one of the most important plant species families.
C. micranthum community

P. suberosa community

C. nigricans community
Study Method 2

- The surveys were performed with the use of two-step investigation procedure:
  - First, 150 specialist informants corresponding to 30 informants for each species were interviewed about their ethnobotanical knowledge concerning the species of our interest.
  - Secondly, 400 informants (100 per village) were interview on their own exploitation of the species.
- Glm with Binomial Errors using ethnic group, species, organ, gender, age and use category as categorical fixed factors.
- Principal Component Analysis based on species-use and plants’ parts-use matrices to summarize the major patterns in the variation of informants responses.
Results & Discussions 1

• The distribution of ethnobotany knowledge is significantly affected by ethnicity factor (d.f. = 3; $\chi^2 = 9.9; P = 0.019$).

• The knowledge distribution was not influenced with gender and age factors (d.f. = 1; $\chi^2 = 0.1; P = 0.8$).

• So, people of the same ethnic group in the same village share more ethnobotanical knowledge than between ethnic groups from different villages.
Figure 2. Distribution of knowledge among ethnic group with respect to species' organs.
Results & Discussions 2

• The relationships between the species and the uses of their different parts, such as their fruits, stems, branches, and flowers, were examined by a PCA based on a plant part - use category matrix (Figure 3).

• The first two axes explained 97.9% of the total variance. Fruits, trunk, bark, flowers and leaves extracts appeared to be the most frequently plant parts used for species such as A. leiocarpa, C. micranthum and C. nigricans.

Figure 3. Score and loading plots from PCA ordination of plant parts used categories for the first two principal components.
Use categories

- Six use categories were identified: Food, forage, construction raw materials, wood fuel, handicraft and pharmacopoeia
- The use category varied with the species: *A. leocarpa* was mainly used for construction while *C. micranthum* for food (Figure 4)
- They are all known useful for wood fuel, Pharmacopoeia, forage and handicraft

**Figure 4.** Score and loading plots from PCA ordination of species-uses categories for the first two principal components.
Results & Discussions 4

Valuation of the species uses

• The species exploitation for wood fuel, forage, pharmacopoeia and handicraft purposes was very common among informants and varied with respect of the species and the ethnic group (P < 0.001).

• The exploitation for food was very low (C. aculeatum and C. micranthum) among informants.
C. aculeatum is used occasionally because of the bad quality of the wood and some traditional and religious reasons.

It is forbidden to burn the wood in Sonraï ethnic because the smoke could provoke madness.

In Fulsé ethnic group the wood is used to cook sacrificed meat.

Figure 5. Exploitation of fuelwood
Fuelwood dominated by *C. nigricans*

Picture 1. Bundles of firewood
Results & Discussions

• The exploitation of the forage varied with respect to the species and to the ethnic group.

• The forage value of most of the species decreased with the increased of the diversity.

• The period of there importance is during the dry season when the nutritive value of herbaceous is null.

Figure 6. Exploitation of forage
Picture 2. Exploitation of the forage of some species
Results & Discussions

- The different services are: construction raw materials, household goods, handicraft, and traditional rite.

- *C. aculeatum*, *C. nigricans* and *P. suberosa* were exploited by few informants because their wood has bad quality.

Figure 7. Exploitation of service wood
Picture 3. Bwa and Fulani houses using *A. leiocarpa* and *C. micranthum*
Common bed of rural people

Basketwork

Armchair

Household goods

Picture 4, House furniture
Agric tool handles using *C. micranthum*

Poultry nest using *C. micranthum*

Fence using *C. micranthum*

Fence using mainly *C. nigricans*

**Picture 5.** Divers uses
P. suberosa exploited for mask purpose

Bwa ethnic group mask with leave

Figure 6. Use of P. suberosa for traditional and cultural rites

Bwa ethnic group mask with fibers
Results & Discussions

- The informants used these five species to cure more than 40 diseases.
- They also used all the five species against malaria (one factor of poverty in Africa).
- It is well established that C. micranthum prevent and cure malaria (Perrey and Goetz, 2004).
- It is also established that P. suberosa is potentially efficient against gastric ulcer (Germano et al., 1998).

Figure 8. Exploitation in pharmacopoeia
• The fruits of *C. aculeatum* are eaten occasionally by the shepherds when they are hungry.

• *C. micranthum* is exploited as tea. But despite the well known active principle, it is underexploited in Burkina compared to other sahelian country like Mali, Niger and Sénégal.

• The adoption of *C. micranthum* in the alimentary habit in the paludal zone could help to reduce the consequences of malaria and in the same time poverty.

**Figure 9.** Exploitation in alimentation
Conclusion

• The distribution of ethnobotany knowledge are influenced by ethnicity factor. There is a need to capitalize the knowledge of different ethnic group in each village, otherwise we are loosing our ancestral knowledge.

• There were also inter- and intra-cultural differences in knowledge of plant uses. We recommend that local people, managers, and scientists should share their experiences to promote the development of appropriate management strategies.

• Planting trees and active management is not part of the traditions of rural people. Therefore, Combretaceae species must be given high priority in any restoration program as they are ecologically adapted to most areas of the country. They are used for various purposes, which indicates the role of forests in sustaining the rural and urban livelihood and contributing to poverty reduction.
Thank you for your attention!