

Farmers' knowledge and interest traits of *hibiscus cannabinus* grown in Burkina Faso.

Abstract

The present study aims to contribute to a better sociocultural knowledge of *Hibiscus cannabinus* through an inventory of the local knowledge and the identification of interest characters for farmers. Seventy-two (72) accessions were collected into fifty-six (56) villages distributed in seven (7) provinces. The information's have been collected through semi-structured interviews. Twelve (12) vernacular names have been counted. Their denomination by the farmers is based on the phenotypic characters such as the cycle of the plant and the seeds origin. Meanwhile the study revealed that the farmers get their seeds among parents and friends, by a direct withdrawal in the spontaneous and cultivated ecotypes, through donation or exchange, the purchasing to the market and the massale selection. This survey also revealed a net regression of *Hibiscus cannabinus* farming that is always practiced mainly by a minority of Mossi and Gurunsi. Indeed, these two ethnic entities use the leaves of this plant as vegetable-leaf for the cooking of the local dishes and are sold even in the local markets. The fibers, the seeds also constitute organs of interest for the local populations who use them respectively for the stringing and for food. The results of this study have permitted to undertake the varietal improvement of the species according to the needs of the producers whose majority have a particular preference for the green ecotypes to long cycle.

Key words: *Hibiscus cannabinus*, local knowledge, Burkina Faso.

INTRODUCTION

Numerous wild plants, in protoculture and cultivated are used as food supplement and they contribute to reduce African people poverty (Schreckenber *et al.*, 2006; Iranbakhsh *et al.*, 2009). Among these species, *Hibiscus cannabinus* bears. Indeed, it is specie that the different parts are used in the food, the traditional medicine and the fibers in the handicraft (Oomen, H.A.P.C. & G.J.H. Grubben, 1978). Its leaves contain a significant quantity of mineral salts (Ca, Mg, K, P, Na), in trace elements (Fe, Al, Mn, Zn etc.) and amino acids such as aspartic acid, glutamic acid (Mnzava, N. A. 1997). In Burkina Faso, *H. cannabinus* has a remarkable socio-economic and cultural importance very considered by the local population. Yet, the national research on the state of the phylogenetic resource for food and agriculture

(MECV, 2006 et MAHRH, 2008) reveals very little information²s about the state of its farming and its diversity. In fact, its farming is practiced in association with other cultures in small fields around the huts (Millogo-Rasolodimby, 2001). Some studies show the extinction of this species and of the endogenous knowledge related to its using (Tiombiano et Kampmann, 2010). So, it is imperative to initiate strategies of conservation of this vegetable-leaf. First of all, that requires the understanding of the rural practices on its diversity management, and the description of the local processes of denomination (Manusset. 2006, Touré et al., 2013). The present survey aims to make an inventory of knowledge and traditional expertise on the management of the species in Burkina. Specifically, (i) list the local knowledge on the rural management of the species, (ii) identify the interest characters for the population and (iii) to establish a collection of *Hibiscus cannabinus* cultivated in Burkina Faso.

1. MATERIAL AND METHODS

1.1. Ethnobotanics investigations and sample collections

Some prospecting collections have been conducted between March and May 2017 in the three climatic zones of the country. The support of provincial directions of agriculture (DPA) and the agents of the technical animation zones (ZAT) that are in touch with the farmers have permitted to identify the provinces and the villages where *Hibiscus cannabinus* is cultivated. A questionnaire permitted to have some information's about the number of locally cultivated varieties, the names of local varieties cultivated by farmers, the morphological interest characters for producers and consumers, the seeds obtainment modes, the plant cultivation period, the aim of its farming (consumption or selling), the seeds origin, the seedling and cultural practices mode, the seeds conservation methods and other different uses. The samples collect have been labeled and have been kept in envelopes. The exhaustive collection technic has been used while collecting among all producers of every village prospected.

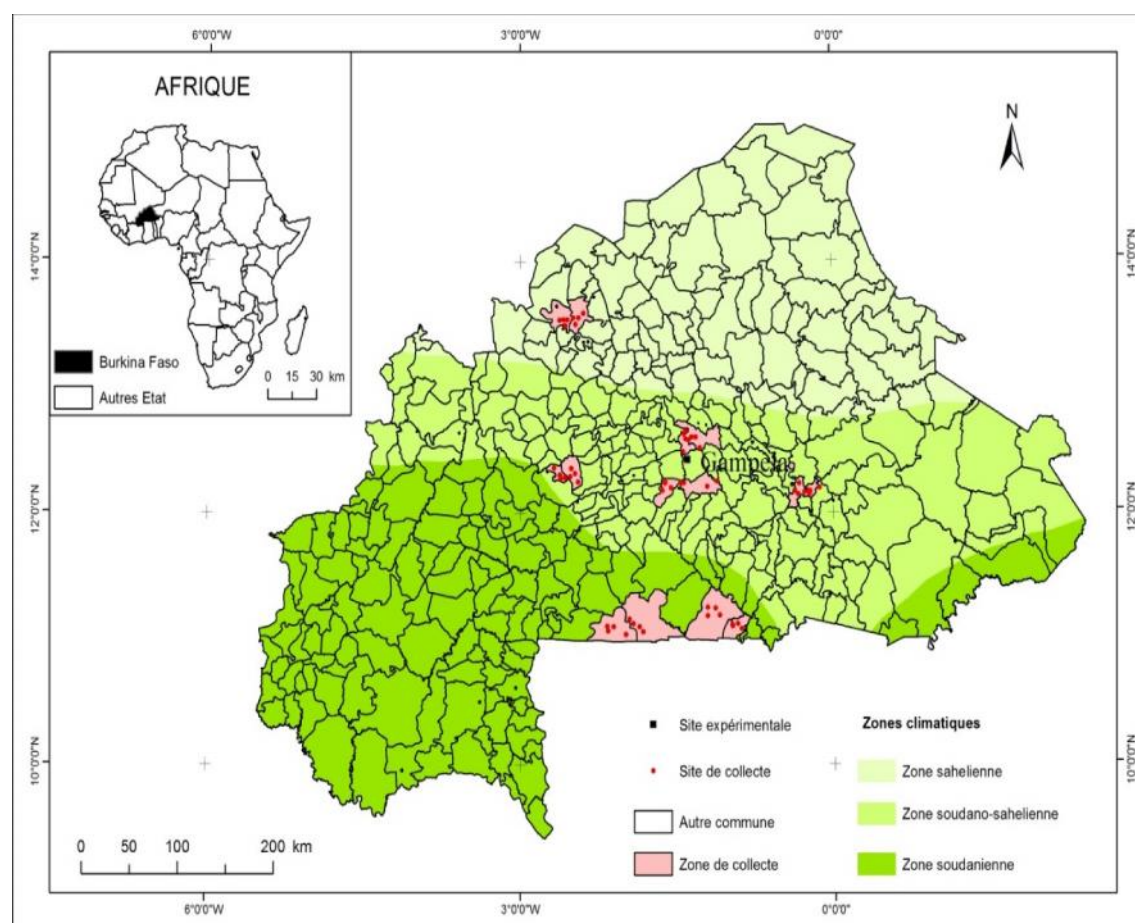
1.2 Statistical analyses

XLSTAT 2016 software served to estimate frequencies and averages of the different parameters evaluated. Thereafter, Excel 2010 software has been used to construct the histograms illustrating the appreciation of the evolution of the cultural state and the organs preference level by the producers.

62 2. RESULTS

63 2.1. Cultural State of *Hibiscus cannabinus*

64 Seven (7) provinces have been identified like zones of culture of *Hibiscus cannabinus*.
65 These provinces are: Kadiogo, Koupéla, Nahouri, Oubritenga, Sanguié, Sissili and Yatenga,
66 (figure 1). A total of 56 villages has been prospected. Two hundred and twenty-four (224)
67 people composed of men and women have been investigated. The number of producers varies
68 of 4 (Yatenga) to 29 (Nahouri) (Table 1). The analysis of this table shows that the species is
69 mainly cultivated by the men and by two ethnic groups. The ethnic group Mossi representing
70 41.67 % of the producers and the ethnic group Gurunsi, 58.33 % of the producers. The ethnic
71 group Gurunsi is composed of three dialectic subgroups: Kasséna, Nuini and Lélé. A total of
72 72 accessions have been collected, of which sixty-nine (69) collected nearby producers, two
73 (02) nearby tradesmen to the market and one (01) get in natural habitat. Most of these
74 investigations (84.34 % of Mossi and 67.61 % of Gurunsi) estimate that *H. cannabinus*
75 farming is in net regress. Two systems of growing are practiced: the **mixed culture** (78.65 %
76 of the person investigated) in small fields (surfaces lower than 0.25 ha), in association with
77 other ~~speculations as the~~ maize, groundnut, vegetable carrot, okra, onion, sweet potato, sorrel
78 and the amaranths or around the fields, serving in general to reduce winds pressure or to
79 delimit the properties. The **monoculture** (either 11.98 % of the persons investigated)
80 practiced especially by gardeners. About 9.37 % of the producers practice at a time the mixed
81 growing and monoculture.



Source : IGB (BNDT.2012)/Collecte EG AP. 2016 et 2017

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Figure 1: Localization of prospecting-collection zones of *Hibiscus cannabinus* accessions

Sites of collection	Number of producers	Proportions of men (%)	Proportions of women (%)
Kadiogo	9	75	25
Kouritenga	25	78	22
Nahouri	29	60	40
Oubritenga	11	82	18
Sanguié	19	75	25
Sissili	18	50	50
Yatenga	4	68	32

Table 1 Distribution of the producers according to province and sex

2.2. Etymological diversity and denomination criterion of *H. cannabinus*

87 The vernacular names of *Hibiscus cannabinus* varies according to the ethnic groups
 88 (Table 2). In the denomination of the morphotypes, the farmers refer to the source of the first
 89 seeds and to the phenotypic character of the plant as the color and the size of the stem, the
 90 cycle of the plant. Thus, the callings for example by Mossis, "*Bèreng pèlga*" meaning " white
 91 *Hibiscus cannabinus* " "*Bèreng miougou*" that means " red *Hibiscus cannabinus* " "
 92 characterized respectively by the white and red color of the stem. The appellation "*Pougtaaré* "
 93 that means "long *Hibiscus cannabinus*" characterizes the large size of the stem. In terms of
 94 the cycle, we have the appellation "*Bèreng raaga*" in mooré, or "*Kanza nian*" in gurunsi-
 95 kasséna and "*Papan tô*" in gurunsi-nuini, that means " male *Hibiscus cannabinus* "; this
 96 characterizes the morphotypes with a very precocious flowering. There is also the appellations
 97 "*Bèreng gnan-ga*" in mooré, "*Kanza bia*" in gurunsi-kasséna or "*Papan zon*" in gurunsi-nuini
 98 that means " female *Hibiscus cannabinus* » that characterizes the morphotype with delaying
 99 flowering. Finally, the appellation "*Bimbèrenga*" in mooré language that means "*Hibiscus*
 100 *cannabinus*” of “Bims” referring likely to the origin of the first seeds.

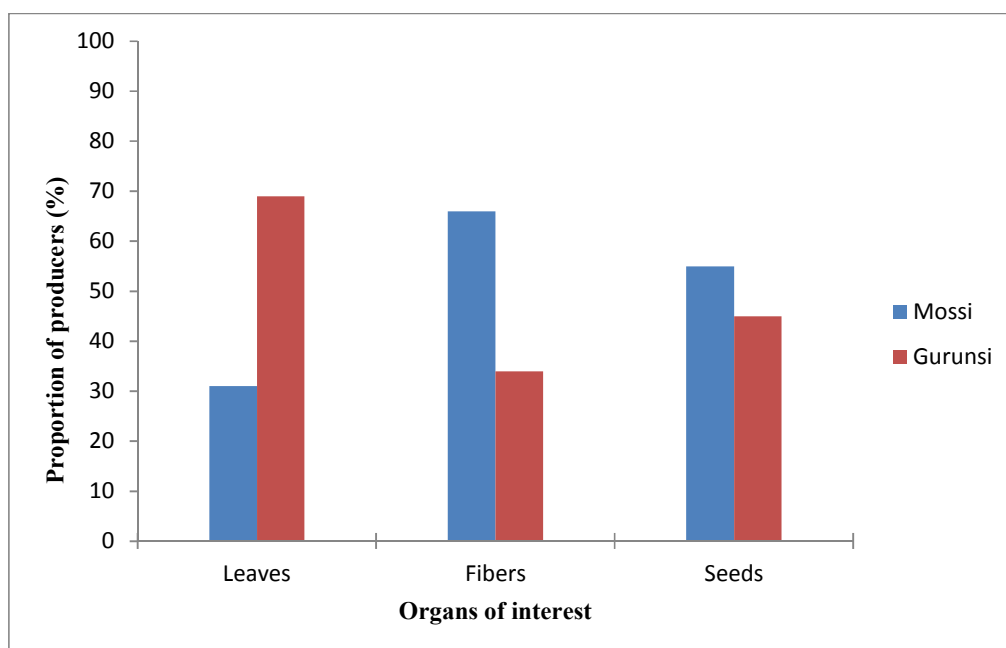
N°	Ethnic group	Vernacular names
1	Mossi	<i>Bèrenga</i> <i>Bimbèrenga</i> <i>Bèreng miougou</i> <i>Bèreng pèlga</i> <i>Bèreng raaga</i> <i>Bèreng gnan-ga</i> <i>Pougtaaré</i>
2	Gurunsi	<i>Kanza nian</i> <i>Kanza bia</i> <i>Papân tô</i> <i>Papan zon</i> <i>Pepana</i>

101

102 **Table 2: Some vernacular names of *H. cannabinus* in local languages**

103 **2.3 The organs of interests for the producers and consumers Mossi and Gurunsi**

104 The figure number two gives an indication of every organ level preference for the
 105 producers and consumers Mossi and Gurunsi. The leaves, the fibers and the seeds constitute
 106 the organs of interest at all ethnic groups (figure 2). Among these organs of interests, the
 107 leaves are the most favorite of the producers and consumers Mossi and Gurunsi. On the one
 108 hand, the plant is cultivated more for its leaves by the Gurunsi (69 % against 31 % by the
 109 Mossi). They are used like vegetable-leaf in the preparation of the local dishes and are even
 110 sold in the local markets. On the other hand, the fibers are mostly used by the Mossi (66 %
 111 against 34 % by the Gurunsi). They serve to manufacture some ropes, to make clothes of the
 112 masks called "*biiddu*" and in the funeral rituals to make the cadavers ready for the funeral.
 113 The seeds are also consumed more by the Mossi (55 % against 45 % at the Gurunsi). They use
 114 it for the manufacturing of soumbala named "*Bicalga*" in mooré and "*gio-sola*" in Gurunsi-
 115 Lélé considered tastier than the soumbala makes on the basis of Néré seeds.



116
 117 **Figure 2:** Preference level indication of the organs by Mossi and Gurunsi producers and
 118 consumers

119 2.4 Seeds acquirement and conservation mode of *Hibiscus cannabinus*.

120 During the ethnobotanical investigations, we notice four methods used to obtain the
 121 seeds. There is the **direct withdrawal** of the seeds way on the stems during the harvest. This
 122 is mainly used by the farmers of the provinces of Sissili (90.6 %), Oubritenga (90.6 %),
 123 Nahouri (78.1 %) and Sanguié (68.7 %). The **massal selection**, especially practiced by the

gardeners in the province of Nahouri (18.8 %). In this method the best  are saved and served to the production of seeds. The purchase and the exchange are methods which are specially practiced by farmers of the provinces of Kouritenga (59.4 %) and Kadiogo (46.9 %). The quantity of seeds need by farmers varies according to their objectives (for the farming of the following rainy season, for sale, exchange, etc.). seeds are kept to the state of "seeds" by 53.6 % of the producers in plastic sachets, bottles, cans and of the canaries in mixture with the ash or leaves of "neem" or in state of "spikes" practiced by 46.4 % of the producers. The spikes are gathered, attached and hung either to a tree (5.7 % of the producers), to the attic (6.8 % of the producers) to a hangar (11.5 % of the producers) or set down on the roof of the house (22.4 % of the producers) (Figure 3).



Figure 3: Some methods of conservation of the seeds of the *H. cannabinus* by the producers

3. DISCUSSION

The results of the ethnobotanical investigation reveal that *Hibiscus cannabinus* is well known and exploited in Burkina Faso, shown by the diversity of its using and its local names. Indeed, we observed a variation of generic names according to the ethnic groups, and this basing on the morphological characteristics. In Burkina Faso, the identification of cultivars basing on the morphological features has been already evoked by Jiro *et al.* (2011), Bationo-Kando *et al.* (2015) and Sawadogo *et al.* (2015). This could be explained by the rural selection mode essentially based on phenotypical characters generally visible and easy to observe. According to Missihoun *et al.* (2012), the local name is the essential element used by the producers in the management and the selection of the genetic resources. Thus, the knowing of the rural nomenclature and the traditional system of classification of the varieties enable an understanding of the dynamics of their diversity. However, we notice a net

regression of *Hibiscus cannabinus* ~~growing~~ in Burkina Faso, **shown** by the number of farming **zone** and the reduced number and ~~very variable of the~~ producers per province (4 to 29). This ~~regression~~ could be linked to the ~~using~~ of improved varieties of the exotic vegetables. Nevertheless, despite the climate variabilities and change, the diseases and the **devastators**, these improved varieties have a better agronomic behavior for the producers. Especially in the Sahel zone which is less watered than the others, the producers receive seeds toward partners of food aids in the zone. Thus the disappearance of **locales** species in these zones. Especially about *Hibiscus cannabinus*, **some using of the plant in our traditional societies are ended** **nowadays**. Indeed, the fibers were used for the ~~confection~~ of the roofs of the huts, the stringing and in traditional rituals. To Mossis' the fibers were used for example for traditional clothes "*biiddu*". They were also used to prepare the cadaver for the funeral rituals and should come necessarily from the nuclear family. This encourages these people to produce the plant. Nowadays, the huts are replaced progressively by more modern buildings; the strings of fibers by string of wool or of nylon and plastic. The cadavers are buried with coffins and the revealed religions oppose to some traditional rituals. The growing is only practiced by two ethnic groups: Mossi and Gurunsi mainly. This could be due to sociocultural reasons. Indeed, the local dish called in mooré "*Bagbenda*", or "*Zintoko*", and in gurunsi "*kanzaga*" cooked with fresh leaves of *H. cannabinus*, Caya blanc, sorrel or amaranth, is a sauce of a highly cultural identity at some ethnic groups, Mossi and Gurunsi (Konkobo-Yaméogo, et al., 2002). The same, seeds of *H. cannabinus* are manufactured into "*soumbala*" very appreciate to Gurunsi-Lélé and the Mossis'.

The results **reveal** that the ~~obtaining mode of~~ the seeds of *Hibiscus cannabinus* remains the same ~~that to~~ all the other cultures in Burkina: the massale selection, the exchanges between producers, through the purchase and the gift (Bationo-Kando *et al.*, 2015, Kiébré, 2016; Kiébré *et al.*, 2017). There is no organization of local variety seeds provision in Burkina. Thus the usual unavailability of seeds every year. Unfortunately, this situation worsens every year because of the unsuitable method of seed conservation. According to Eteka *et al.* (2011), the choice of seeds conservation mode is guided by the type and the quantity of seeds. So the methods used are essentially, the storage of the seeds in canaries, attics, cans, bottles, plastic sachets or the exhibition of the spike on the roofs of the houses, on trees, under hangars etc. These methods showed their limits because the seeds are often attacked by bugs borers or the spontaneous corn-shelling of the spike, which cause the enormous losing of seeds. Besides *Hibiscus cannabinus* is essentially produced in mixed

culture during rainy season often acting as reducing wind pressure to protect the other cultures. In the big urban centers, it is practically inexistent and even unknown.

CONCLUSION

The study revealed that *Hibiscus cannabinus* is always ~~grewed~~ in rural zones but it is in net ~~regression~~ to the detriment of exotic vegetables. In these rural zones, the leaves and the seeds are much consumed. Indeed, the use of the fibers in the stringing and the ~~confection~~ of the roofs of hut is ~~always exist and~~ practiced by a minority in Mossi and Gurunsis zones. The study even revealed diversity of mode of seeds production based on the direct withdrawal in the spontaneous and cultivated ecotype, the exchanges between parents and friends, the purchase to the market and the massale selection. The survey of the farmer' nomenclature of the local varieties shown that peasants use morphological features in the ~~denomination~~ of the local varieties. These last exploit mostly the green local varieties, to long cycle and to large size that give an important foliar mass. Such information can be taken in account in the next works of local varieties improvement.

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