

*Full Length Research Paper*

# Species of the *Corchorus* genus: Identification, nomenclature and socio-economic role in Burkina Faso

Sawadogo Zakaridja<sup>1\*</sup>, Kiebre Zakaria<sup>1</sup>, Kiebre Mariam<sup>1</sup>, Sawadogo Pingawinde<sup>2</sup> and Bationo-Kando Pauline<sup>1</sup>

<sup>1</sup>Biosciences Laboratory, Genetics and Plant Breeding Team, Joseph Ki-Zerbo University, Ouagadougou, Burkina Faso.

<sup>2</sup>Tenkodogo University Center, Thomas Sankara University, Tenkodogo, Burkina Faso.

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Indigenous leafy vegetables play a significant socio-economic role for the local population. However, most of them used at the local level have not been studied a lot and their nutritional values are less implemented. This study focuses on the local nomenclature and the socio-cultural services of the species of *Corchorus* genus. Therefore, a collection followed by an ethnobotanical survey was carried out in 22 provinces of Burkina Faso during which a total of 450 people were surveyed. Four species of *Corchorus* genus, namely *Corchorus olitorius*, *Corchorus tridens*, *Corchorus aestuans* and *Corchorus fascicularis* were identified. The local names of these species vary from 1 to 4 names depending on ethnical groups. However, differentiation criteria related to status, productivity and/or preference of populations, pubescence and colour of plant are generally used to differentiate the species. All identified species are used as leafy vegetables and for the preparation of very tasty drinking (Dolo), because of their mucilage. As for medicine, 25.33% of the people surveyed gave information on illnesses such as anemia, stomach aches, and malaria treated with *Corchorus* genus species. Considering the socio-economic value of these species for the local population, research programs on its valorization through varietal improvement must be initiated.

**Key words:** *Corchorus*, leafy vegetable, valorization, Burkina Faso.

## INTRODUCTION

The *Corchorus* genus consists of about 50 to 60 species found in tropical and subtropical regions (Ghosh et al., 2014). Most of them are found in Africa and are of significant socio-economic interest for the local population (Benor et al., 2011). In Burkina Faso, the *Corchorus* genus species are among the most consumed

leafy vegetables. They are also a source of income for women who are the main actors in terms of production and marketing (Kiebre et al., 2017; Hama-Ba et al., 2017).

Formerly considered as weeds, the species are more and more cultivated and research works have been

\*Corresponding author. E-mail: sawazakaria@gmail.com.

conducted to lay foundations for its improvement and valorization. Thus, agromorphological, molecular and biochemical characterizations conducted in several countries including Ethiopia (Benor et al., 2011; Benor et al., 2012), Benin (Adebo et al., 2015; Aquilin et al., 2018), Burkina Faso (Kiebre et al., 2017, 2019) have highlighted the existence of very high intra- and interspecific variability indicating opportunities for genetic improvement. The studies also revealed that the leaves of *Corchorus* genus species are a good source of protein, vitamins (A, C, E), minerals such as iron, zinc, potassium, phosphorus, and  $\beta$ -carotene (Steyn et al., 2001; Soro et al., 2012; Kiebre et al., 2021). As a result, they can be used as a nutritional supplement to cereal-based foods that are generally poor in nutrients.

In Burkina Faso, most of the research programs only focused on the *Corchorus olitorius* species. However, earlier studies by Thiombiano et al. (2012), revealed the existence of several species belong to *Corchorus* genus. These species, used very locally, have nutritional and therapeutic potentialities that have been less rated and documented. In order to contribute for a better valorization of these phylogenetic resources, this study would focus on highlighting the socio-cultural services of the species of *Corchorus* genus consumed as leafy vegetable in Burkina Faso. Specifically, it will include, (i) the identification of species of the *Corchorus* genus in the different phytogeographic sectors and the establishment of a geographical division of species of the *Corchorus* genus in Burkina Faso, (ii) the identification of local nomenclatures of the species listed, (iii) the identification of the socio-economic services of *Corchorus* species for the local population in Burkina Faso.

## MATERIALS AND METHODS

### Study area

Burkina Faso is a Sahelian country located in the center of West Africa between the 9 and 15th degrees of latitude North and longitudes 2° 20' East and 50° 3' West. The country's climate is Sudano-Sahelian (MAHRH, 2007; Thiombiano and Kampmann, 2010). The study covered 22 provinces in Burkina Faso belonging to 4 phytogeographic sectors. The choice of the provinces was made considering the probable existence of different species of *Corchorus* genus.

### Survey and ethnobotanical investigation

The study was conducted between September 2020 and January 2021. The survey was conducted in collaboration with the local population and the ministry in charge of agriculture. The respondents were selected according to age, gender, and socio-professional activity. Ethnobotanical data were collected through semi-structured interviews using a survey form consisting of 2 parts. The first part is related to the socio-demographic informations of the respondent (name and surname, age, marital status, ethnicity, socio-professional category). The second one is related to information on the species of *Corchorus* genus.

### Collection and identification of species

To avoid any confusion on the recognition of *Corchorus* spp. by the populations, photos and herbarium of each species were presented to them. Accessions of the different *Corchorus* spp. were collected from each locality. These collected accessions were kept in envelopes and coded. The identification of the collected species was done in two ways. First, each species collected was identified by a vernacular name according to the local language of the area. Then each species was identified by its scientific name either on the site in comparison with the herbaria we possess, or at the laboratory. The nomenclature method adopted is that of Mbaye (2001) for the description of species of the genus *Corchorus* from Senegal.

### Data analysis

The ethnobotanical data collected were processed and analyzed using Excel 2007, XLSTAT 2016 and Sphinx Plus<sup>2</sup> software. Thus, the socio-demographic data and the perception of the respondents on the uses, nomenclature and production were analyzed using descriptive statistics by calculating the average, percentage or frequency, etc. However, to determine the socio-economic value of each of the species, the following parameters were calculated using the formula used by Fah et al. (2013) and Ta-Bi et al. (2016).

The citation frequency (Cf) of each *Corchorus* spp. was determined using the following formula :

$$Cf = \frac{\text{Number of citations of the species}(n)}{\text{Total number of citations of all species } (N)}$$

The Use Value (UV), which significantly determines which species have a high use value compared to other species, was evaluated using the formula:

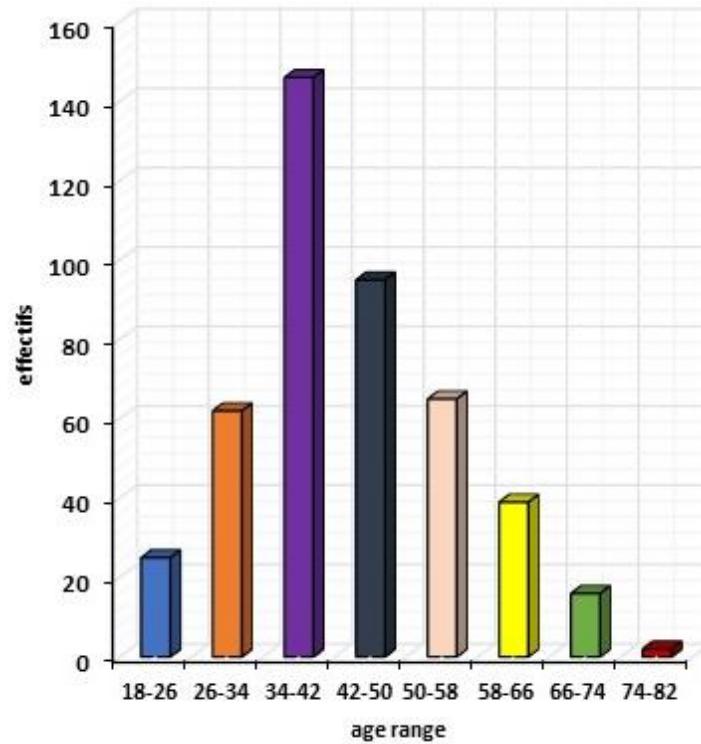
$$UV = \frac{\text{Number of uses of the species mentioned by each respondent } (U)}{\text{the total number of respondents who mentioned the species } (N)}$$

The Food Use Value (FUV) and the Therapeutic Use Value (TUV) were also calculated. They respectively correspond to the number of meals made from each species and the number of diseases treated by each species. The parameters (Cf and FUV), (Cf and TUV) were used to carry out 2 Hierarchical Ascending Classifications (HAC) of the plants and to establish homogeneous groups.

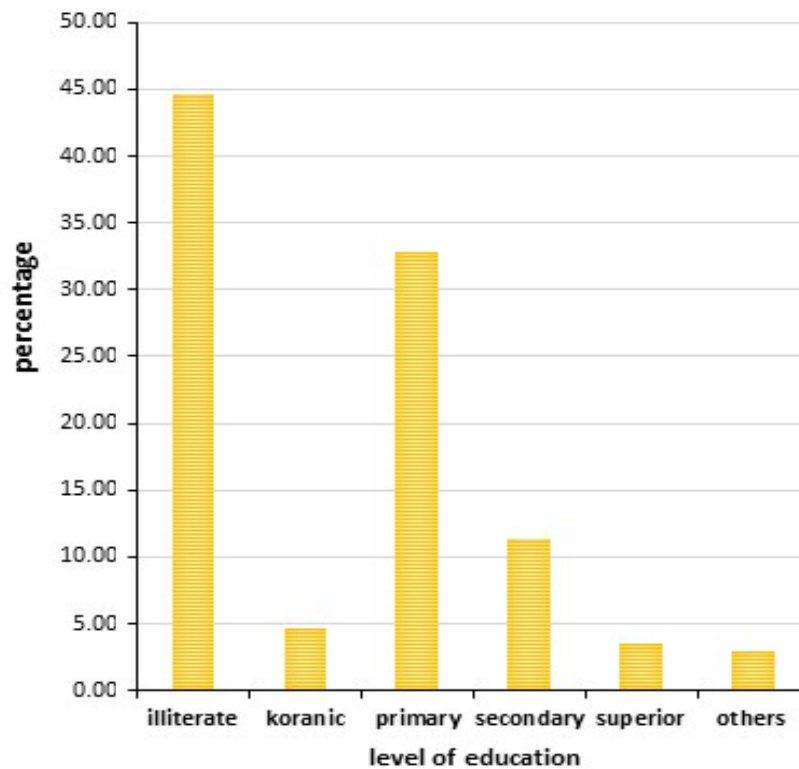
## RESULTS

### Socio-demographic characteristics of the respondents

During the survey, 450 people were interviewed, 61.3% of them were women and 38.7% men, aged between 18 and 80 years (Figure 1). Among the respondents (Figure 2), 201 had no schooling, 148 had primary education, 51 had secondary education and 16 had higher education. The surveyed population is divided into 21 ethnic groups most of them are farmers (82.66%), that is 58.2% of non-vegetable farmers and 24.40% of vegetable farmers. 8.40% of respondents work in various fields of activity,



**Figure 1.** Distribution of respondents by age group.  
Source: authors



**Figure 2.** Distribution of respondents according to the level of education.  
Source: authors



**Figure 3.** The different species of the *Corchorus* genus encountered in the surveyed areas: a and b: *C. aestuans*; c: *C. fascicularis*; d: *C. tridens*; e: *C. olitorius* var *incisifolius*; f: *C. olitorius* var *olitorius*.  
Source: authors

while 8.88% are vegetable traders in markets. At those markets, amaranths, sorrel and *C. olitorius* are the most commercialized leafy vegetables.

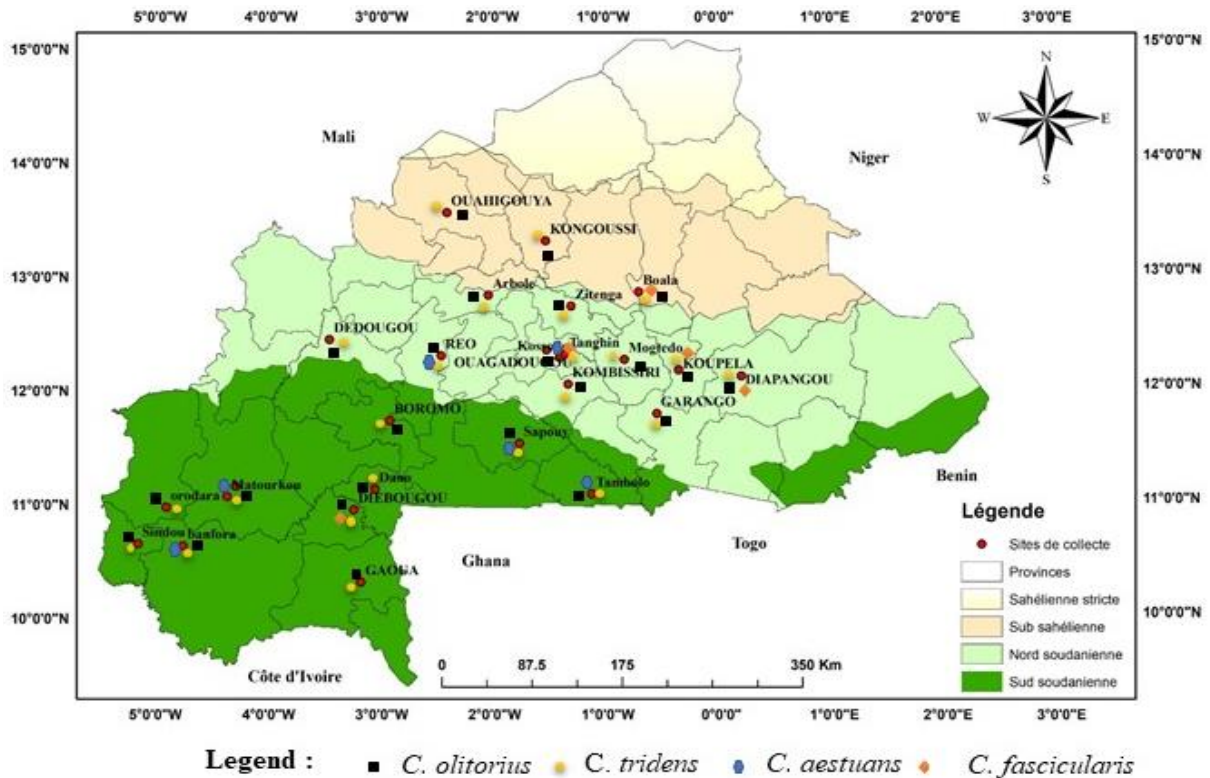
#### Species of the *Corchorus* genus identified during the survey

During the surveys collected, 4 species (Figure 3) from the *Corchorus* genus were identified in different areas. These were *Corchorus aestuans* (Figure 3a and b), *Corchorus fascicularis* (Figure 3c), *Corchorus tridens* (Figure 3d), and *C. olitorius* (Figure 3e and f). Among these 4 species, *C. olitorius* is the only one which is cultivated. The others are in proticulture or in spontaneous habitats. These species are unevenly found in the different phytogeographical areas of the country (Figure 4). The North and South Sudanese zones have a high species diversity of *Corchorus*. In these zones, all the 4 species of *Corchorus* were identified. However, in the sub-Saharan zone, 2 species, namely *C. olitorius* and *C. tridens*, were encountered. Thus, *C. olitorius* and *C. tridens* are the most widespread species because they exist in the different departments of the provinces covered by the study. *C. fascicularis* and *Corchorus aestuans* are the least widespread species as they were

only identified respectively in 5 departments (Ouagadougou, Diapangou, Boala, Diébougou and Koupéla) and 6 departments (Pô, Réo, Sapouy, Banfora, Bobo-dioulasso and Ouagadougou).

#### Local nomenclature for species of the genus *Corchorus*

The 4 species of the *Corchorus* genus are known by the same names in each ethnic group. The vernacular name varies from 1 to 4 depending on the ethnic group (Table 1). However, the differences between the 4 species are based on several criteria. Indeed, as far as the status (cultivated or wild) of the plants is concerned, *C. tridens*, *C. aestuans*, *C. fascicularis* and *C. olitorius* var *olitorius* are "wild" species while *C. olitorius* var *incisifolius* is cultivated. Taking into account the productivity, size or preferences, large species with broad leaves are "females" and short size species with thin leaves are "males". Thus, *C. aestuans* and *C. olitorius* are called "female *Corchorus*" which in this context means broad-leaved and tender *Corchorus* and *C. tridens* and *C. fascicularis* are known as "male *Corchorus*". Secondly, focusing on the varietal type, *C. olitorius* var *incisifolius* is named *Corchorus* of the "whites" which means improved

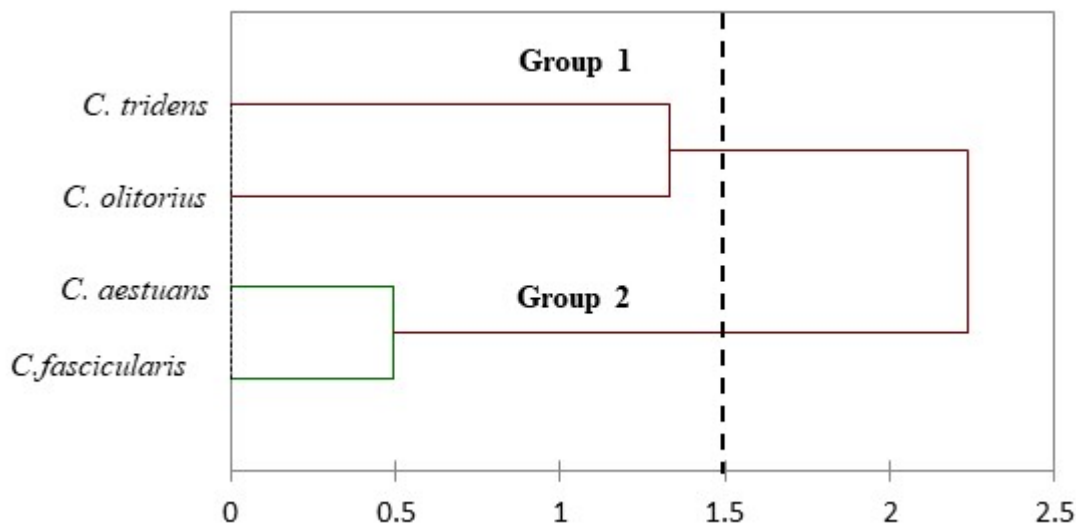


**Figure 4.** Map of Burkina Faso showing the dispersion of *Corchorus* species in the surveyed areas.  
Source: authors

**Table 1.** Vernacular names of species of the *Corchorus* genus according to ethnic groups.

No.	Ethnic groups	Number of respondents	Vernacular names attributed to the 4 species
1	Bissa	15	<i>djintaralè, djintara, djintaré</i>
2	Bobo	27	<i>dongonon</i>
3	Bobo-dioula	6	<i>sobo, sobon</i>
4	Bwaba	16	<i>foirou, foirie, fouahin</i>
5	Dafing	9	<i>sobon</i>
6	Dagara	10	<i>fonchôlô, fochôlô</i>
7	Dioula	3	<i>sobon, sobo</i>
8	Goin	6	<i>djampoilé</i>
9	Gourmatché	20	<i>gbiangbian, tihanfrade, tipindi</i>
10	Gourounsi	65	<i>kagnon, kagnonfrofro, êwôh, kowoo</i>
11	Karaboro	4	<i>linwoho, djampoilé</i>
12	Lobi	7	<i>poar</i>
13	Mossi	209	<i>bulvanka, bulvaka, bulvanko, vantchôlô</i>
14	Peulh	13	<i>fakou</i>
15	Pougouli	2	<i>waaro</i>
16	Robo	3	<i>dongonon</i>
17	Samo	14	<i>yérénké, boalôn, bole</i>
18	Sénoufo	7	<i>vôlongô</i>
19	Turka	4	<i>yalga</i>
20	Yanaa	4	<i>bulvak, bilvak</i>
21	Zaocé	6	<i>zilvanka</i>

Source: authors



**Figure 5.** Dendrogram of the hierarchical classification of *Corchorus* species according to Citation frequency (Cf) and Food Use Value (FUV).  
Source: authors

or introduced variety. However, *C. tridens*, *C. aestuans*, *C. fascicularis* and *C. olitorius* var *olitorius* are "local varieties". Moreover, focusing on the color of the vegetative apparatus, 2 types of *Corchorus* were identified, namely "red" *Corchorus* and "green" *Corchorus* by 26.73% of the respondents, and on the basis of stem and leaf pubescence, 1.90% of the respondents identified *C. aestuans* as "hairy" *Corchorus*.

### Socio-economic roles of the species of *Corchorus* encountered

#### Food role and prohibition of *Corchorus* spp.

The *Corchorus* species encountered in this study are generally used as leafy vegetables. The leaves of these plants are used in fresh and dry state for the preparation of several local dishes. The species consumed and the dishes made from these species vary according to ethnic groups. Thus, among the Mosse people, species such as *C. olitorius*, *C. tridens*, and *C. fascicularis* are used as leafy vegetables in the preparation of sauce to be eaten with "tô", an African dish made from cereal flour. The leaves of these species are also used to prepare couscous "wêsla" made with cereal flour. However, there are prohibitions on the consumption of species of the genus *Corchorus* within this ethnic group. Indeed, 6.1% of respondents do not eat *Corchorus* for cultural reasons. Some families in the department of Zitenga and Ouahigouya made of them a prohibition. According to them, any member of the family who consumes it would go blind.

Among the Gurunssi, called éwo or kagnon, *C. olitorius*

and *C. aestuans* are used as leafy vegetables. *C. tridens* for its mucilage is used in the preparation of the local beer "dolo" among the Gourounsi people from Réo. Among the bwaba people, *C. olitorius* is the only species used as a leafy vegetable. For the preparation of "dolo" this ethnic group uses *C. olitorius* and *C. tridens* because of their mucilage. In the Dagara and Lobi areas, respectively called Fontchôlo and Poan in the local language, in addition to the leaves of *C. olitorius* and *C. tridens*, the young pods are dried and ground into powder for the preparation of sauce to be eaten with to in dry seasons.

Thus, the values of food use and the frequency of citations have made it possible to classify *Corchorus* species. Indeed, the hierarchical ascending classification according to Ward's method based on the frequencies of citations and the food use values show 2 groups of plants (Figure 5). The first group, consisting of *C. olitorius* (Cf = 0.45 and FUV = 0.51) and *C. tridens* (Cf = 0.27 and FUV = 0.30), are the most cited species and the most used in the preparation of various local dishes, the second group consisting of *C. fascicularis* (Cf = 0.10 and FUV = 0.09) and *C. aestuans* (Cf = 0.03 and FUV = 0.02), are species rarely used in the preparation of local dishes.

#### Medicinal role of *Corchorus* spp.

Respondents (25.33%) provided information on the various diseases treated with species of the *Corchorus* genus. The diseases treated, the parts of the plant used, the method of preparation of medicines and the method of administration are recorded in Table 2. *C. olitorius* is the most cited species in the treatment of diseases.

**Table 2.** Plants of the *Corchorus* genus and treated infections.

Infections	Species used	Organs of the plant used	Preparation mode	Use
Anemia	<i>C. olitorius</i>	Leaves	Decoction	Administer the decoctant orally
	<i>C. fascicularis</i>		Cooking	Consume the dough obtained during the cooking process
	<i>C. aestuans</i>			
Diarrhoea	<i>C. olitorius</i>	Leaves	Cooking: Cereal leaves and flours	Consuming the mixture
Dysentery	<i>C. olitorius</i>	Leaves	Cooking: Cereal leaves and flours	Consuming the mixture
		Roots	Decoction	Administer the decoctant orally
Scabies	<i>C. tridens</i>	Seeds	Decoction	Bathing with the decoctant
Stomach ache	<i>C. olitorius</i>	Leaves	Cooking: Leaves with potash	Consumption
	<i>C. fascicularis</i>			
	<i>C. tridens</i>			
	<i>C. olitorius</i>	Roots	Decoction	Administer the decoctant orally
	<i>C. tridens</i>			
	<i>C. olitorius</i>	Seeds	No preparation: Raw	Crunching the seeds
Constipation	<i>C. olitorius</i>	Young fruits and seeds	Cooking	Consumption
	<i>C. fascicularis</i>			
	<i>C. tridens</i>			
	<i>C. aestuans</i>			
	<i>C. olitorius</i>	Buds	Cooking	Consumption
Malaria	<i>C. olitorius</i>	Leaves	Decoction	Bathing with the decoctant
	<i>C. tridens</i>	Fruits and seeds		
Toothache	<i>C. olitorius</i>	Roots	Decoction	Rinse the mouth with the decoction
Measles	<i>C. olitorius</i>	Stems	Decoction	Bathing with the decoctant
Fever	<i>C. olitorius</i>	Fruits and seeds	Decoction	Administer the decoctant orally
		Roots	Decoction	Bathing with the decoctant
Gangrene	<i>C. aestuans</i>	Fruits and seeds	Decoction	Rinse throat with decoction

Table 2. Contd.

Pain in the eyes	<i>C. fascicularis</i>	Seeds	Crushed	Juice and water are introduced into the eyes
Heart condition	<i>C. olitorius</i>	Leaves	Cooking	Administer the decoctant orally
Cold in ruminants	<i>C. olitorius</i>	Leaves	Kneading	The juice is introduced into the nostrils
Wounds of domestic animals	<i>C. olitorius</i>	Leaves	Kneading	The juice is introduced into the wound

Source: authors

Leaves, stem, roots, fruits, and seeds are the organs used for the preparation of medicines. Leaves are the most used organ (75.43%). Fruits and seeds are used in 12.28% of cases. Stems and roots were cited as the least used in respectively 7.01 and 3.63% of cases.

Considering the frequency of citation and the value of therapeutic use, a hierarchical ascending classification of *Corchorus* species was carried out. The results show 3 groups of plants (Figure 6). The first group consists of *C. tridens* (Cf = 0.17 and TUV = 1.08) and *C. fascicularis* (Cf= 0.1 and TUV = 1.16), these species are little used in diseases treatment. The second group formed by *C. aestuans* (Cf = 0.021 and TUV = 0.75), a species used only in the treatment of 3 diseases. *C. olitorius* (Cf= 1.21 and TUV= 0.75) which forms the third group, is the most solicited species in the treatment of diseases.

### Economic role of *Corchorus* spp. in Burkina Faso

In rural areas, *Corchorus* is usually harvested from the wild for family consumption. The remaining leaves are sold fresh (46.23%) or dry (53.77%). In the fresh state, the leaves are sold at the local markets in heaps whose price varies between CFAF 25 and CFAF 50.

In urban centers, market gardeners mainly

cultivate *C. olitorius* for commercial purposes. Thus, sales are generally made fresh with the wholesalers who sell vegetables at the markets at heaps of CFAF 4,000 to CFAF 5,000 per unit. Whole boards are also sold at prices ranging from CFAF 6,000 to CFAF 8,000. For retail sale, the prices of the heaps vary between CFAF 50 and CFAF 250. In the dry state, the leaves are preserved and sold during the lean season in retail bags at prices ranging from 25 to CFAF 50.

At the wholesale level, the leaves are sold either in dishes at prices ranging from 150 to CFAF 2,000 or in 100 kg bags at prices ranging from 5,000 to CFAF 7,500. In the eastern region, dry leaves imported into Niger are sold at CFAF 20,000 per 100 kg bag.

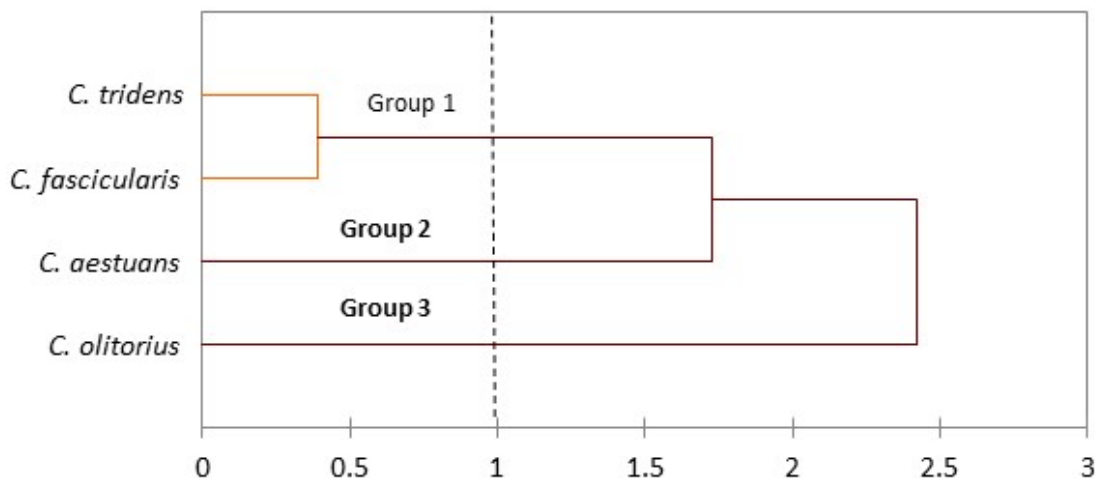
### DISCUSSION

The ever use of species of *Corchorus* as leafy vegetables by all ethnic groups shows the importance of these species in the diet of the local population. According to Hama-Ba et al. (2017), the species *C. olitorius* is ranked first in terms of consumption in the localities of Loumbila, Koubri, and Kongoussi in Burkina Faso. However, the number of species and the different organs (leaves, stems, and fruits) used in food that differ from one ethnic group to other shows that the consumption of traditional leafy vegetables and

traditional knowledge are heritages that are transmitted from generation to generation. Indeed, the use of unripe fruit in the preparation of glutinous sauce by the Dagara and Lobi ethnic groups could be explained by a transmission of culinary know-how from one generation to another. The use of dried and powdered immature fruits in the preparation of glutinous sauce was observed in Nigeria by Grubben and Denton (2004). Ethnic diversity and socio-cultural beliefs could be a major advantage in maintaining and enhancing plant species through the maintenance and enhancement of local foods. According to Baskar Rajan (2005) and Kahane et al. (2005), the maintenance of traditional cuisine and socio-cultural beliefs represents a socio-economic, as well as a strategic and ecological issue in the maintenance of diversity.

In addition to their use as food plants, species of the *Corchorus* are a source of income and can be considered as medicinal plants. Indeed, the infections treated by species of *Corchorus*, and the different organs used were also reported by Ta-Bi et al. (2016) and Adjatin et al. (2017) in Côte d'Ivoire and Benin. The results of this study revealed that *C. olitorius* is the most used and cultivated species in Burkina Faso. Dansi et al. (2008) also identified *C. olitorius* as the most consumed in Benin. This species was also identified as the most cultivated and consumed species of the *Corchorus* genus in Côte d'Ivoire





**Figure 6.** Dendrogram of the hierarchical classification of species of the *Corchorus* genus according to Citation frequency (Cf) and the Therapeutic Use Value (TUV)  
Source: authors

(Ta-Bi et al., 2016). Thus, the domestication of some species suggests a high socio-economic interest of these species compared to other species. The cultivation of *C. olitorius* in vegetable gardens could be justified by the existence of morphotypes with highly valued characteristics, its high demand and market value. According to Adjatin et al. (2017), agronomic, culinary, and economic criteria contribute to the selection of varieties by producers. Furthermore, the high use of *C. olitorius* and *C. tridens* could be explained by the fact that these species are widespread and known by populations due to the adaptability of the species to the different pedoclimatic conditions of the country.

As far as local nomenclature is concerned, it remains unspecified and incomplete. Indeed, the species are known under the same name generally unexplained in each ethnic group. Moreover, within the same ethnic group, the same species can have several local names. Thus, observed synonymy and homonymy do not allow for accurate assessment of inter- and intraspecific variability. Similar observations have been reported by Doh (2015), Ta-Bi et al. (2016) and Kiebre et al. (2017). According to Doh (2015), in local nomenclature, it is common for the same species to have multiple local names or for multiple species to have the same name. In addition, local name variation is due to the existence of multiple ethnic subgroups within the same ethnic group (Kiebre et al., 2017) or distortion of the original name (Ta-Bi et al., 2016). Moreover, the identification criteria used by the respondents do not allow the classification of the different species encountered. Indeed, these identification criteria namely the position of the plant, plant and leaves color, size and shape of the different parts of the plant do not take into account the intra-specific variability. This confusion in nomenclature and identification criteria is because these species show a very important intra-

specific variability with many morphological characters very close. This is especially true because the taxonomic position of these species has long been controversial. Indeed, initially classified in the family Malvaceae, later in the family Tiliaceae, the *Corchorus* genus is nowadays classified in the Malvaceae family (Akoègninou et al., 2006; Heywood et al., 2007).

Furthermore, the high proportion of women among the respondents is justified by the fact that women are generally responsible for local dishes, especially sauces. As a result, the management and sourcing of these vegetables is an exclusively female activity. The results of this study corroborate those of Kiebre et al. (2017), according to which the predominance of women in *C. olitorius* production is explained by socio-cultural beliefs. Dansi et al. (2008) and Benor et al. (2009) argue that women are more responsible for the collection and domestication of *C. olitorius* and leafy vegetables in general than men. In addition, there is the market value of the crop. Indeed, in rural areas, its production is considered a female activity because it is considered a vegetable for the sauce. In addition, the income from its marketing is considered very low by men in the villages. However, in urban centers, the production of *C. olitorius* by men is justified by its high market value, which constitutes a significant source of income for producers.

Moreover, the high proportion of farmers in the survey sample could be explained by the fact that agriculture is the country's main economic activity.

## Conclusion

This study, conducted in 21 provinces in Burkina Faso, allowed the identification of 4 species of *Corchorus* found in 3 phyto-geographic sectors. Among these species only

*C. olitorius* is cultivated, the other species are either in protoculture or in the wild. All the 4 species are known by the same names in each ethnic group and are of socio-economic interest to the local population. The difference between the species is based on the status (cultivated or wild) of the plants, productivity, varietal type, and color of the vegetative apparatus. Leaves of all species of *Corchorus* are consumed as leafy vegetables by the different ethnic groups encountered during the study. However, the species consumed, and the dishes made from each species differ from one ethnic group to another and according to the region. In addition, the sale of the leaves is a source of income for women. As far as medicine is concerned, the different organs (roots, stems, leaves, buds, fruits, and seeds) of all the species listed are used in the treatment of several diseases in Burkina Faso. Considering the importance of the *Corchorus* species in Burkina Faso, it would be interesting to focus on improving the plants of these species. Therefore, agromorphological and molecular characterizations would be necessary.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

## REFERENCES

- Adebo HO, Ahoton LE, Quenum F, Ezin V (2015). Agro-morphological characterization of *Corchorus olitorius* cultivars of Benin. Annual Research & Review in Biology 7(4):229-240. <http://sciencedomain.org/rewied-history/9825>
- Adjatin A, Balogoun D, Loko L, Djengue W, Bonou-gbo Z, Honnankpon Y, Dansi A, Akoégninou A, Akpagana K (2017). Phenotypic diversity, uses and management of local varieties of *Corchorus olitorius* L. from central Benin. Journal of Biodiversity and Environmental Sciences 11(1):81-96.
- Akoégninou A, Burg WJ, Maesen LJG van der (2006). Flore analytique du Benin. Leiden: Backhuys Publisers (Wageningen Agricultural University papers 06.2). P 1034.
- Aquilin EG, Anicet GD, Hospice GD, Innocent DA, Bonaventure AO, Alexandre D (2018). Morphotype diversity of *Corchorus olitorius* and influence of agricultural practices on its potential major pest insects. Scientia Horticulturae 239:234-241. <https://doi.org/10.1016/j.scienta.2018.05.047>
- Baskar-Rajan G (2005). Leafy Vegetables. Hyderabad, Ukaaz Pub. 178 p.
- Benor S, Blattner FR, Demissew S, Hammer K (2009). Collection and ethnobotanical investigation of *Corchorus* species in Ethiopia : potential leafy vegetables for dry regions. Genetic Resources and Crop Evolution 57(2):293-306.
- Benor S, Demissew S, Hammer K, Blattner FR (2012). Genetic diversity and relationships in *Corchorus olitorius* (Malvaceae s.l.) inferred from molecular and morphological data. Genetic Resources and Crop Evolution 59(6):1125-1146.
- Benor S, Jörg F, Blattner FR (2011). Genome size variation in *Corchorus olitorius* (Malvaceae) and its correlation with elevation and phenotypic traits. NRC Research Press, Genome 54(7):575-585.
- Dansi A, Adjatin A, Adoukonou-Sagbadja H, Faladé V, Yedomonhan H, Odou D, Dossou B (2008). Traditional leafy vegetables and their use in the Benin republic. Genetic Resources and Crop Evolution 55(8):1239-1256. <https://doi.org/10.1007/s10722-008-9324-z>.
- Doh KS (2015). Plantes à potentialité antidiabétique utilisées en médecine traditionnelle dans le district d'Abidjan (Côte d'Ivoire): étude ethnobotanique, caractérisation photochimique et évaluation de quelques paramètres pharmacodynamiques de certaines espèces. Thèse de Doctorat de l'Université Félix Houphouët Boigny de Cocody-Abidjan (Côte-d'Ivoire), UFR Biosciences P 150.
- Fah L, Klotoué JR, Dougnon V, Koudokpon H, Fanou VBA, Dandjesso C, Loko F (2013). Etude ethnobotanique des plantes utilisées dans le traitement du diabète chez la femme enceinte à Cotonou et Abomey-Calali (Benin). Journal of Animals and Plant Sciences 18(1):2647-2658. ISSN : 2071-7024. <http://www.m.elewa.org/JAPS>
- Ghosh KR, Wongkaew A, Sreewongchai T, Nakasathien S, Phumichai C (2014). Assessment of Genetic Diversity and Population Structure in Jute (*Corchorus spp.*) Using Simple Sequence Repeat (SSR) and Amplified Fragment Length Polymorphism (AFLP) Markers. Kasetsart Journal-Natural Science 48(1):83-94.
- Grubben GJH, Denton OA (2004). Ressources végétales de l'Afrique tropicale. Volume 2, Légumes. (eds). Fondation PROTA / Backhuys Publishers / CTA, Wageningen P 737. ISBN: 9789057821493.
- Hama-Ba F, Parkouda C, Kamga R, Tenkouano A, Diawara B (2017). Disponibilité, modes et fréquence de consommation des légumes traditionnels Africains dans quatre localités du Burkina Faso a diverses activités de maraichage. Ouagadougou, Koubri, Loubila, Kongoussi. African Journal of Food Agriculture Nutrition and Development 17(1):11552-11570. ISSN:1684-5374. Doi: 10.18697/ajfand.77.15960.
- Heywood VH, Brummitt RK, Culham A, Sereng O (2007). Flowering Plant Families of World. Ryal Botanic Gardens, Kew pp. 424.
- Kahane R, Temple L, Brat P, Hubert DB (2005). Les légume-feuilles des pays tropicaux : diversité, richesse économique et valeur santé dans un contexte très fragile. Colloque Angers pp. 3-14.
- Kiebre M, Kiebre Z, Traore RE, Bationo-Kando P, Sawadogo N, Sawadogo M (2017). Ethnobotanical and agromorphological characterizations of *Corchorus olitorius* L. accessions in Burkina Faso. Journal of Experimental Biology and Agricultural Sciences 5(3):309-320.
- Kiebre M, Sawadogo B, Kiebre Z, Sawadogo N, Kabore B, Sawadogo B, Bationo-Kando P (2019). Molecular Characterization of *Corchorus olitorius* L. of Burkina Faso. Journal of Experimental Agriculture International 32(2):1-9.
- Kiebre M, Sawadogo N, Kiebre Z, Sawadogo B, Sawadogo Z, Sawadogo M, Bationo-Kando P (2021). Agronomic Performances and Nutritional Value of *C. olitorius* in Burkina Faso. Journal of Agriculture and Ecology Research International 22(2):35-44.. <https://doi.org/10.9734/jaeri/2021/v22i230186>
- MAHRH (2007). Document guide de la révolution verte. P 98.
- Mbaye MS, Noba K, Sarr RS, Kane A, Sambou JM, Amadou Tidiane BA (2001). Eléments de précision sur la systématique d'espèces adventives du genre *corchorus* (tiliaceae) au Sénégal. African Journal of Science and Technology. Science and Engineering Series 2(1):51-64.
- Soro CL, Ocho-anin AAL, Armand KKK, Christophe K (2012). Evaluation de la composition nutritionnelle des légumes feuilles. Journal of Applied Biosciences 51:3567-3573.
- Steyn NP, Olivier J, Winter P, Burger S, Nesamvuni S (2001). A survey of wild, green, leafy vegetables and their potential in combating micronutrient deficiencies in rural populations. South African Journal of Sciences, 97(7):276-279.
- Ta-Bi IHNK, Bomisso EL, Assa RR, Aké S (2016). Etude Ethnobotanique de quelques Espèces du genre *Corchorus* rencontrées en Côte d'Ivoire. European Scientific Journal 12(24):415-431.
- Thiombiano A, kampmann D (2010). Atlas de la biodiversité de l'Afrique de l'Ouest, Tome II : Burkina Faso. Ouagadougou et Frankfurt/Main. P 625.
- Thiombiano A, Marco S, Stefan D, Amadé O, Karen H, Georg Z (2012). Catalogue des plantes vasculaires du Burkina Faso. Edition: Boissiera 65. Publisher: Conservatoire et Jardin botaniques de la Ville de Genève P 391. ISBN: 978-2-8277-0081-3. Doi : 10.13140/RG.2.1.4734.1521.