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Floristic diversity of weeds in maize (*Zea mays* L.) of agroecosystems in South Western of Burkina Faso

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Abstract

In Burkina Faso, corn is one of the main cereal crops of great nutritional and economic importance. However, its production is strongly hampered by competition from weeds. This study was carried out with the aim of identifying the main harmful weeds of corn in the south-west zone of the Burkina Faso. Floristic surveys were carried out during two successive agricultural campaigns, in 2020 and 2021, in peasant fields using the field tour method. The results showed that the corn weed flora is made up of 81 species distributed in 61 genera and 20 families. The most dominant families in terms of number of weed species are, in descending order, Poaceae (34.62%) and Asteraceae (8.97%). According to the harmfulness indices, Ipomoea eriocarpa (Fc=97.4%), Triumfetta cordifolia (Fc=90.7%), Striga hermonthica (Fc=72.1%), Senna occidentalis (Fc=55.9%), Pupalia lappacea (Fc=54.3%), Crotalaria barkae (Fc=50.9%) and Vernonia galamensis (Fc=50.3%) are considered to be more harmful, with high centesimal frequencies (Fc ≥ 50%). This flora is dominated by Therophytes (68%), with 56 species revealed, followed by Chamephytes (16%), with 13 species. The similarity coefficient value (Cs=89.24%) reveals a floristic homogeneity between the three provinces involved in the study. These results could serve as a preliminary basis in the development of a biological control method against harmful weeds in corn crops.

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Introduction

Agriculture is one of the sectors of activity contributing to the socio-economic development of populations and employing more than 40% of the world's active population (Adjalian *et al.,* 2014). It is the leading economic sector in sub-Saharan African countries where high percentages of populations live and work in rural areas (Fernandes *et al.,* 2019). It supports economic development, through the production of food and cash crops (Hollinger and Staatz, 2015). In Burkina Faso, agriculture occupies more than 86% of the total population and contributes at 40% to the Gross Domestic Product (GDP) (INSD, 2014). Agriculture in Burkina Faso is of subsistence type with essentially crops such as millet, fonio, rice, sorghum and corn, grown sometimes in association with legumes such as cowpeas and/or peanuts. Sorghum, millet and corn alone provide 80% of cereal production (Traoré, 2016). In South West Burkina Faso, corn contributes at 48% to 57% of all cereals production (Sankara *et al.,* 2016). However, the production of these two crops faces competition from weeds, taht is a serious threat to farmers. Indeed, weeds enormously affect agricultural yields, especially in the South Sudanese phytogeographic zone (Traoré and Maillet, 1998) where pedoclimatic conditions are favorable for their development. Production losses due to weeds have been estimated between 41% and 75% (Traoré, 2016).

Beyond the yield losses caused through competition with crops for light and nutrients, weeds can also serve as shelter for pests and plant pathogens. Faced with this constraint, controlling or reducing weed infestation in crop production should help increase production to meet the food availability. Thus, in-depth knowledge of weeds evolving in corn agroecosystems remains an essential prerequisite for improving weed control strategies. In Burkina Faso, most of the work in this direction was carried out on cotton farms (Etiabi *et al.,* 2021, Zoma *et al.,* 2022; Koulibaly *et al.,* 1998). Hence the present study aiming to inventory the weed flora of maize agroecosystems in the South West of Burkina Faso with a view to identifying the most harmful weeds is important.

Materials and methods

Site of the study

The study was carried out in five villages located in the province of Comoé (Fabédougou, Diamon, Séréfédougou, Mondon, Moussodougou), seven villages located in the province of Léraba (Dakoro, Baguéra, Ouéléni, Niankorodougou, Sindou, Kankalaba and Lèra) and five villages located in the province of Kénédougou (Kourinion, Sian, Kourouma, Kayan and Ndorola) (Fig. 1). These villages are located in the South Sudanese phytogeographic sector of Burkina Faso (Fontes and Guinko, 1995) characterized by a climate of Sudanian-type and two distinct seasons, especially rainy and dry seasons (Thiombiano and Kammpman, 2010). The vegetation is made up of a mosaic of gallery and riparian forests, wooded, wooded and shrub savannahs (Fontes and Guinko, 1995). It contains some of the densest forest formations in the country. In terms of floristic diversity, this zone is the richest area of Burkina Faso. The local population is made up of more than 15 ethnic groups, mainly the *Turka*, the *Goin*, the *Sénoufo* and the *Peulh*. Dioula is the main spoken language.

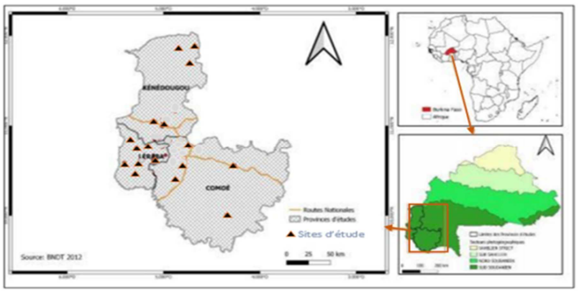

Fig.1. Location of study sites

Agriculture and livestock breeding are the main socio-economic activities practiced by the populations. Sorghum, millet, corn, cowpea and sesame are the dominant crops found on farms.

Methods

The floristic surveys were carried out on corn agroecosystems farms in two successive years, 2020 and 2021. The floristic survey technique used was that of Braun-Blanquet (1932). It consisted of listing the weed species emerging in the area delimited by the cords. The minimum areas, three per agricultural holding, were delimited according to the homogeneity of the vegetation. They were made up of plots of 100 m^2 (10 m x 10 m). Five minimum areas were retained per farm and the number of surveys per minimum area was four. Thus, 51 floristic surveys in the province of Comoé, 37 surveys in the province of Léraba and 24 floristic surveys in the province of Kénédougou were conducted. Surveys were carried out during the period of full weed growth and the abundance-dominance (A/D) index of each species was estimated (Table 1). This index appears to be a good criterion for comparing weeds that do not show the same biological characteristics (Le Bourgeois and Guillerm 1995). The weeds recorded were then identified using different flora (Bérhaut, 1967; Merlier and Montégut, 1982). The specimens of those subjected to doubt were subsequently determined thanks to those from the Herbarium of the University of Ouagadougou (OUA Herbarium). The nomenclature adopted was that of Lebrun and Stork (1997).

Table 1. Abundance-dominance scale

Ladder	Meaning
1.	Sparse or abundant individuals, but low recovery
2.	Very abundant individuals or covering 1/20 of the sampled surface
3.	Individuals covering ¼ to ½ of the surface, any abundance
4.	Individuals covering ½ to ¾ of the surface, any abundance
5.	Individuals covering more than ¾ of the surface, any abundance

Data analysis

The data collected were analyzed using qualitative and quantitative approaches. The quantitative approach consisted of defining the level of agronomic importance of each weed species. It was based on the determination of:

The absolute frequency (Fa) of the species, representing the number of times a species has been observed in N records;

The centesimal frequency (Fc) of the species, representing the ratio of the absolute frequency to the total number of readings and determined by the formula:

$$Fc = Fa/N \times 100 \quad (1)$$

The average abundance-dominance index of a weed species represents the sum of the abundance-dominance scores over the total number of (N) surveys where the species is present. The average abundance-dominance index (I-A/Dmoy) was determined according to the following formula:

$$\text{I-A/Dmoy} = \frac{\sum \text{I−AD de l'espèce}}{\text{N}} \quad (2)$$

The generic diversity index (Idg) of botanical families indicates the ratio of the number of species to the number of genera in a family. This index provides information on the floristic diversity of weeds inventoried in each of the three provinces and the entire South West region. Its high value reflects that the family considered is less diverse. It was obtained using the following formula:

$Idg = \frac{NE}{NG}$ (3), with NE, number of species and NG, number of genera

The qualitative approach aims to establish the list of weeds of corn agroecosystems in the South western region of Burkina Faso.

Biological spectrum

Each weed species recorded was classified in its taxonomic family, assigned to its corresponding biological type (TB). The biological type classification model adopted was that of de Raunkier (1934). This classification distinguishes the following biological types: Nanophanerophytes (Np), Chamephytes (Ch), Therophytes (Th), Geophytes (Gé), Hemicryptophytes (Hé) and Phanerophyte (Ph).

Similarity coefficients

The similarity coefficient (Cs) was used to determine the degree of resemblance between the weed lists of the three provinces. The formula used was that of Sorensen (1948):

$$Cs = \frac{2c}{a+b} x100$$

(a) represents the number of species belonging to a list (A) of weeds, drawn up following the inventory carried out in the localities of a given province; (b) represents the number of species belonging to a list (B) that we wish to compare to the first list and (c) represents the number of species common to (a) and (b). In theory, the similarity coefficient varies between 0 and 100%, but in practice these limit values are almost never reached and, when the similarity coefficient is greater than or equal to 50%, this indicates that the two lists compared are very close to each other; in other words, the two environments concerned can be considered floristically identical.

Results

Floristic richness of weeds in corn cultivation

Table 2 presents the list of weeds in maize agroecosystems in the South western region of Burkina Faso. This flora is made up of 81 species divided into 61 genera and 20 families. Of the entire flora inventoried, four weeds: *Aristida hordeacea*, *Crotalaria mucronata*, *Heteranthera callifolia* and *Oldenlandia herbacea* are absent in the flora of the Cascades province, six weeds: *Aristida hordeacea*, *Cenchrus biflorus*, *Croton hirtus*, *Elionorus elegans*, *Ischaemum rugosum* and *Vicoa leptoclada* in the flora of the province of Léraba and nine weeds: *Boerhavia diffusa, Crotalaria mucronata, Croton hirtus, Cyperus distans, Elionorus elegans, Heteranthera callifolia, Imperata cylindrica, Sporobolus festivus* and *Vicoa leptoclada* in the flora of the province of Kénédougou. According to the harmfulness indices*, Ipomoea eriocarpa* (Fc=97.4%), *Triumfetta cordifolia* (Fc=90.7%) *Striga hermonthica* (Fc=72.1%), *Senna occidentalis* (Fc=55.9%), *Pupalia lappacea* (Fc=54.3%), *Crotalaria barkae* (Fc=50.9%) and *Vernonia galamensis* (Fc=50.3%) are weeds with high centesimal frequencies (≥ 50%). As for their abundance-dominance, five (5) species of weeds namely *Senna occidentalis* (A-D=1.50), *Ipomoea eriocarpa* (A-D=1.75), *Striga hermonthica* (A-D=1.67), *Pupalia lappacea* (A-D=1.63) and *Triumfetta cordifolia* (A-D=1.50) presented a high average Abundance/dominance index (≥1.5). The eight most dominant families in terms of number of weed species were, in descending order, Poaceae (34.62%), Asteraceae (8.97%), Amaranthaceae, Euphorbiaceae, Rubiaceae, Malvaceae and Fabaceae-Faboideae (6.41% each) and Commelinaceae (5.13%). The contribution of other families to the total number was low (≤4.00%) (Fig. 2). In each province, the same families were found at the top of the list.

Table 2. Weed flora inventoried in corn cultivation

Species	Families	Provinces			Fc	A/D
		Casc	Léra	Kén	(%)	
Acalypha ciliata Forsk.	Euphorbiaceae	+	+	+	10.0	0.90
Adenia lobata (Jacq.) Engl.	Passifloraceae	+	+	+	39.7	0.95
Ageratum conizoides L.	Asteraceae	+	+	+	13.7	1.00
Alternanthera sessilis R.Br.	Amaranthaceae	+	+	+	14.0	0.32
Alysicarpus glumaceus Valh.	Fabaceae-Faboideae	+	+	+	17.1	0.52
Amaranthus graecizans L.	Amaranthaceae	+	+	+	49.3	0.17
Amaranthus spinosus L.	Amaranthaceae	+	+	+	3.0	0.84
Amaranthus viridis L.	Amaranthaceae	+	+	+	15.6	0.26
Andropogon gayanus Kunth.	Poaceae	+	+	+	2.3	1.00
Aristida hordeacea Kunth.	Poaceae	-	-	+	6.3	1.03
Aspilia Africana Pers.	Asteraceae	+	+	+	9.4	0.71
Bidens pilosa L.	Asteraceae	+	+	+	22.6	0.14
Blumea aurita (L.) DC.	Asteraceae	+	+	+	31.4	0.90
Boerhavia diffusa L.	Nyctaginaceae	+	+	-	40.1	0.50
Cassia mimosoides L.	Fabaceae-Mimosoideae	+	+	+	3.0	0.47
Cassia obtusifolia L.	Fabaceae-Caesalpinioideae	+	+	+	11.6	1,00
Senna occidentalis (L.) Link.	Fabaceae-Caesalpinioideae	+	+	+	55.9	1.50
Celosia trigyna L.	Amaranthaceae	+	+	+	10.4	1.00
Cenchrus biflorus Roxb.	Poaceae	+	-	+	11.7	0.72
Centrosema pubescens Benth.	Fabaceae-Faboideae	+	+	+	28.3	0.99

Chloris pilosa Schumach.	Poaceae	+	+	+	5.2	1.21
Commelina aspera Benth.	Commelinaceae	+	+	+	19.3	0.17
Commelina Bengalensis L.	Commelinaceae	+	+	+	26.2	1.00
Commelina difusa Burm.	Commelinaceae	+	+	+	27.2	0.33
Commelina forskalaei Vahl.	Commelinaceae	+	+	+	12.0	0.47
Convolvulus prostratus Forssk.	Convolvulaceae	+	+	+	28.6	0.33
Corchorus olitorius L.	Malvaceae	+	+	+	14.1	0.97
Corchorus tridens L.	Malvaceae	+	+	+	10.5	1.01
Crotalaria barkae Schweinf.	Fabaceae-Faboideae	+	+	+	50.9	1.25
Crotalaria mucronata (L.) DC.	Fabaceae-Faboideae	-	+	-	9.6	0.41
Crotalaria retusa (L.) DC.	Fabaceae-Faboideae	+	+	+	33.4	1.00
Croton hirtus L'Hér.	Euphorbiaceae	+	-	-	17.8	0.89
Cynedon dactylon (L.) Pers.	Poaceae	+	+	+	9.6	1.00
Cyperus distans Lf.	Cyperaceae	+	+	-	19.3	1.00
Digitaria ciliaris (Retz) Koeler.	Poaceae	+	+	+	4.0	1.00
Digitaria sanguinalis (L.) Scop.	Poaceae	+	+	+	6.9	0.14
Echinochloa crus-galli L.	Poaceae	+	+	+	8.0	0.63
Eleusine indica (L.) Gaertn.	Poaceae	+	+	+	21.4	0.12
Elionorus elegans Kunth.	Poaceae	+	-	-	4.0	0.17
Eragrostis aspera (Jacq.) Nees.	Poaceae	+	+	+	28.6	0.41
Eragrostis linearis (Schum.) Benth.	Poaceae	+	+	+	31.7	1.20
Euphorbia convolvuloides Hochst.	Euphorbiaceae	+	+	+	32.1	0.45
Euphorbia heterophylla L.	Euphorbiaceae	+	+	+	11.8	1.74
Euphorbia hirta L.	Euphorbiaceae	+	+	+	17.9	0.90
Heteranthera callifolia Rchb.	Poaceae	-	+	-	24,3	1.00
Hyptis spicigera Lam.	Lamiaceae	+	+	+	28.7	0.14
Hyptis suaveolens (L.) Poit.	Lamiaceae	+	+	+	4.0	0.36
Imperata cylindrica (L.) P.Beauv.	Poaceae	+	+	-	7.3	0.95
Ipomoea eriocarpa R. Br.	Convolvulaceae	+	+	+	82.4	1.75
Ischaemum rugosum Salisb.	Poaceae	+	-	+	5.2	0.78
Kyllinga erecta Rottb.	Cyperaceae	+	+	+	17.9	0.54
Lolium multiflorum Lam.	Poaceae	+	+	+	9.9	0.54
Mariscus alternifolius L.	Cyperaceae	+	+	+	3.3	0.25
Melochia corchorifolia L.	Malvaceae	+	+	+	15.2	1.00
Mitracarpus villosus (Sw.) DC.	Rubiaceae	+	+	+	6.9	1.21
Oldenlandia herbacea (L.) Roxb.	Rubiaceae	-	+	+	4.1	0.77
Oldenlandia lancifolia (Schum.) DC	Rubiaceae	+	+	+	15.6	0.78
Panicum laxum L.	Poaceae	+	+	+	10.6	0.51
Panicum maximum L.	Poaceae	+	+	+	4.1	0.78
Paspalum conjugatum Berg.	Poaceae	+	+	+	2.3	0.14
Paspalum orbiculare Forst.	Poaceae	+	+	+	7.6	0.84
Pennisetum pedicellatum Trin.	Poaceae	+	+	+	11.8	1.11
Pennisetum polystachion (L.) Schult.	Poaceae	+	+	+	5.6	1.00
Pentodon pentandrus Ehrenb.	Rubiaceae	+	+	+	41.5	1.21
Pharis arundinacea L.	Poaceae	+	+	+	26.3	0.32
Physalis angulata L.	Solonaceae	+	+	+	24.4	0.97
Portulaca quadrifida L.	Portulacaceae	+	+	+	5.9	0.71
Pupalia lappacea (L.) Juss.	Amaranthaceae	+	+	+	54.3	1.63
Rottboellia cochinchinensis Clayton.	Poaceae	+	+	+	14.0	0.24
Scoparia dulcis L.	Plantaginaceae	+	+	+	21.4	1.32
Setaria barbata (Lam.) Kunth.	Poaceae	+	+	+	2.9	1.00
Setaria pumila (Poir.) Roem.	Poaceae	+	+	+	18.2	0.18
Spermacoce ruelliae DC.	Rubiaceae	+	+	+	30.0	0.55
Sporobolus festivus R.Br.	Poaceae	+	+	-	13.9	0.70
Stachytarpheta angustifolia Mill.	Verbenaceae	+	+	+	37.3	1.20
Striga hermonthica (Del.) Benth.	Scrophulariaceae	+	+	+	92.1	1.67
Tridax procumbens L.	Asteraceae	+	+	+	14.4	1.10
Triumfetta cordifolia A. Rich.	Malvaceae	+	+	+	74.7	1.50
Triumfetta pentandra A.Rich.	Malvaceae	+	+	+	4 .7	0.50
Vernonia galamensis (Cass.) Less.	Asteraceae	+	+	+	49.5	0.89
Vicoa leptoclada (Webb.) Dandy	Asteraceae	+	-	-	7.9	1.10

Fc=centesimal frequencies, A/D= abundance/dominance, Casc= Cascade, Léra=Léraba, Kén= Kénédougou, (+)= presence, (-)= absence

Table 3. Taxonomic distribution of corn weeds

Localities	Families		Genera		Idg
	Number	%	Number	%	
Cascade	20	100	61	100	1.3
Léraba	20	100	61	100	1.2
Kénédougou	19	95.2	60	98.3	1.2
South West Region	20	100	61	100	1.3

Table 4. Generic diversity indices of botanical families

Families	Cascade			Léraba			Kénédougou		
	N	%	Idg	N	%	Idg	N	%	Idg
Poaceae	25	30.8	1.3	23	28.4	1.2	23	28.4	1.2
Asteraceae	7	8.6	1.2	6	7.4	1.0	6	7.4	1.0
Amaranthaceae	5	6.1	1.7	5	6.1	1.7	5	6.1	1.7
Euphorbiaceae	5	6.1	2.5	4	4.9	2.0	4	4.9	2.0
Rubiaceae	4	4.9	1.0	5	6.1	1.3	5	6.1	1.3
Malvaceae	5	6.1	1.7	5	6.1	1.7	5	6.1	1.7
Fabaceae-Faboideae	4	4.9	2.0	5	6.1	2.5	4	4.9	2.0
Commelinaceae	4	4.9	4.0	4	4.9	4.0	4	4.9	4.0
Cyperaceae	3	3.7	1.0	3	3.7	1.0	2	2.4	0.7
Lamiaceae	2	2.4	2.0	2	2.4	2.0	2	2.4	2.0
Convolvulaceae	2	2.4	1.0	2	2.4	1.0	2	2.4	1.0
Fabaceae-Caesalpinioideae	1	1.2	1.0	1	1.2	1.0	1	1.2	1.0
Fabaceae-Mimosoideae	1	1.2	1.0	1	1.2	1.0	1	1.2	1.0
Verbenaceae	1	1.2	1.0	1	1.2	1.0	1	1.2	1.0
Scrophulariaceae	1	1.2	1.0	1	1.2	1.0	1	1.2	1.0
Nyctaginaceae	1	1.2	1.0	1	1.2	1.0	0	0.0	0.0
Passifloraceae	1	1.2	1.0	1	1.2	1.0	1	1.2	1.0
Solonaceae	1	1.2	1.0	1	1.2	1.0	1	1.2	1.0
Portulacaceae	1	1.2	1.0	1	1.2	1.0	1	1.2	1.0
Plantaginaceae	1	1.2	1.0	1	1.2	1.0	1	1.2	1.0

N=number, Idg=generic diversity index

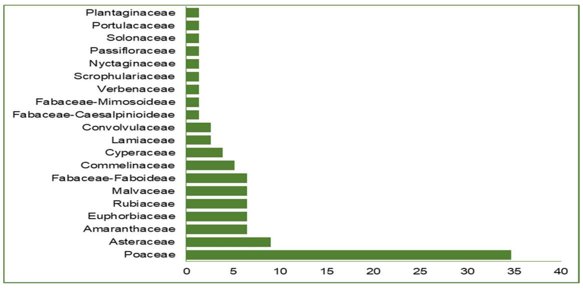

Fig. 2. Botanical families of weeds inventoried

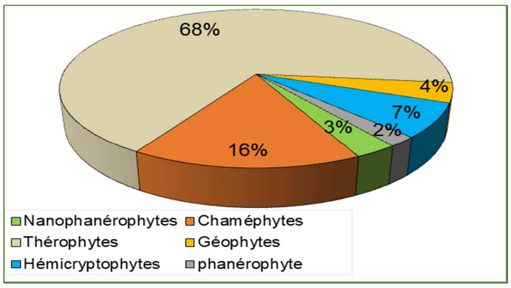

Fig. 3. Biological types of weeds

Generic diversity index

The number of weed botanical families, the genera and the values of the generic diversity indices are recorded in Table 3. Globally, the calculated values of the generic indices were relatively low, 1.3 for the entire regio, 1.3 for the flora of the Cascades province and 1.2 for the flora of Léraba and that of Kénédougou. Table 4 reveals that the families Convolvulaceae, Fabaceae-Caesalpinioideae, Fabaceae-Mimosoideae, Verbenaceae, Scrophulariaceae, Nyctaginaceae, Passifloraceae, Solonaceae, Portulacaceae and Plantaginaceae had the lowest generic diversity indices (Idg=1.0 for each). The highest generic diversity index in each of the three provinces was observed with Commelinaceae family (Idg=4.0). This family of weed was followed in the Cascades province by three other families classified in the following order: Euphorbiaceae (Idg=2.5), Fabaceae-Faboideae and Lamiaceae (Idg=2 for each). In the Leraba province, after the Commelinaceae (Idg=4.0), the Fabaceae-Faboideae (Idg=2.5), the Lamiaceae and the Euphorbiaceae (Idg=2.0 for each) recorded the highest generic diversity index. In the Kénédougou province, the

Commelinaceae family (Idg=4.0) was followed by the family of Lamiaceae, Fabaceae-Faboideae and Euphorbiaceae (Idg=2 for each).

Biological spectra

The weed flora of corn agroecosystems was essentially composed of six biological types (Fig. 3). The analysis of the biological spectrum revealed a large dominance of Therophytes (68%), with 56 species, followed by the Chamephytes (16%), with 13 species and the Hemicryptophytes (7%) with 6 species. As for the other biological types, their contribution to the total population was low (<5%). Monocotyledonous comprised 5 families, 21 genera and 31 species (39.1%), while the dicotyledonous include 15 families, 34 genera and 50 species (60.1%) (Table 5).

Table 5. Structure of the weed flora of corn crops

Classes	Families		Genera		Especies	
	N	%	N	%	N	%
Dicotylédones	15	78.9	34	55.7	50	60.9
Monocotylédone	05	21.1	27	44.2	31	39.1
Total	19	100.0	61	100.0	81	100.0

N= number, %= percentage

Table 6. Similarity coefficients between the three inventoried provinces

Pairs of localities	Number of weed species			Cs (%)
	a	b	c	
Cascade*Léraba	77	75	70	92.10
Cascade*Kénédougou	77	72	67	89.93
Kénédougou*Léraba	72	75	63	85.71

a=number of species from list A; b=number of species from list B; c=number of species from list C; Cs=Similarity coefficient

Similarity coefficients

The calculated similarity coefficient values varied from 85.71% to 92.10% (Table 6). The highest value of the similarity coefficient (Cs=92.10%) was obtained by comparing the floristic list of the Cascade province with that of the Leraba province. The calculated coefficients were all greater than 50%, reflecting the homogeneity of the weed flora of corn agroecosystems in the South West of Burkina Faso.

Discussion

The weed flora of corn agroecosystems in South West Burkina Faso is characterized by 81 species divided into 61 genera and 20 botanical families. This flora is characterized by the predominance of Poaceae which appear to be the best represented taxa in genera and species. Ecological factors such as temperature, humidity and soil properties seem to be favorable to the growth and development of Poaceae (Mick *et al.,* 2015). In addition, the development of species belonging to this family is favored by the open environment. Corn being an airy crop, this certainly contributed to the growth of weeds. The results obtained in this present study are consistent with those from previous work (Zohhra *et al.,* 2020 ; Ka *et al.,* 2019). Fabaceae-Caesalpinioideae, Fabaceae-Mimosoideae, Verbenaceae, Scrophulariaceae, Nyctaginaceae, Passifloraceae, Solonaceae, Portulacaceae and Plantaginaceae were less represented comparatively the findings of Noba *et al.* (2004) and Ahonon *et al.* (2018). This could be explained by the difference in rainfall and soil type that exist between the study areas. Compared to the weed flora of corn cultivation established in Senegal by Bassène (2012), that of the present study seems less diversified in terms of number of weed species. This difference could be explained by the geographical positions of the two countries and also the different climatic conditions.

Comparison of the floristic lists of each province using the similarity coefficient method revealed that all the values of the similarity coefficients obtained were always greater than 50%. These results show that the three provinces studied are floristically similar. It should also be noted that in corn farming systems in South western Burkina Faso, the dominant biological types of weeds are Therophytes and Chamephytes. These weeds are better adapted to tropical agroecosystems due to their mode of reproduction (sexual multiplication) and very high germination power. In addition, the exposure of agroecosystems to the sun favors the development of therophytes and Chamephytes, because most of these weeds are heliophiles (Braun-Blanquet, 1932). Dicotyledonous were more represented than monocotyledonous. This strong representativeness of Dicotyledonous was also observed by Touré *et al.*

(2008) in Ivory Coast and Ka *et al.* (2019). Also, the preponderance of Dicotyledonous are in concordance with the results of Ahonon *et al.* (2018) who showed that the weed flora of bean crops is dominated by dicotyledonous (79%). This similarity suggests that there is no adventitious flora specific to a given crop as observed elsewhere by Djennadi-Ait-Abdallah *et al.* (2015). Furthermore, by refering to their abundance, *C. barkae, P. lappacea, S. occidentalis, I. eriocarpa, T. cordifolia* and *S. hermonthica* appear to be the most dominant. They were more represented by Therophytes with a high capacity of infestation and adaptation in the three study provinces, and are not destroyed by synthetic chemical herbicides. Their strong dominance would reflect the nature of their harmfulness and therefore deserve particular monitoring. Indeed, the abundance of a weed represents one of the components of its competition (Tlig *et al.,* 2012). These results corroborate with the work of Traoré and Maillet (1998) in Burkina Faso, Ahonon et al. (2018) in Ivory Coast and Diouf *et al.* (2019) in Senegal, according to which, the more frequent a weed is, the more competitive and harmful it is to crops. According to Ahonon *et al.* (2018), *C. barkae, S. occidentalis* and *P. lappacea* belong to the groups of weeds that cause more damages in bean and cereal crops. Likewise, they affect sorghum and rice crops (Strahan *et al.,* 2000) where depending on the infestation levels, they can cause yield losses of around 100% due to their competitive characteristics.

Conclusion

Floristic inventories carried out in corn agroecosystems in the South West of Burkina Faso made it possible to identify 81 weed species divided into 61 genera and 20 families. The most dominant botanical families in terms of number of weed species are Poaceae, Asteraceae, Amaranthaceae, Euphorbiaceae, Rubiaceae, Malvaceae, Fabaceae-Faboideae and Commelinaceae. This flora is essentially composed of Therophytes, Chamephytes and Hemicryptophytes. The more numerous dicotyledonous contained 15 families, 34 genera and 50 species. Monocotyledonous are less represented in the flora, with a total 5 families, 21 genera and 31 species. High abundance-dominance indices as well as centesimal frequencies were observed in *Ipomoea eriocarpa, Triumfetta cordifolia, Striga hermonthica, Senna occidentalis, Pupalia lappacea*, *Crotalaria barkae* and *Vernonia galamensis* are to be considered as more harmful in maize cultivation. Furthermore, the comparison using the method of similarity coefficients of the floristic lists of each of the provinces in which the inventories were carried out reveals a floristic homogeneity. This study could be of great use in biological control of the main weeds in corn cultivation.

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