Global Journal of Biodiversity Science and Management
2016. 6(1): 1-13
ISSN: 2074-0875
Journal home page: http://www.aensiweb.com/ GJBSM/

RESEARCH ARTICLE

Inventory of the adventitious flora in a cereal agro-system in the plain of Tessala (Western Algeria.)

Megherbi-Benali Aicha, ZOUAOUI Sofiane Abderrahim, TOUMI Benali Fouzia, DIF Mustapha Mahmoud, HAMAL Laid

Laboratoire écodéveloppement des espaces, Département des sciences de l'environnement, Faculté des sciences de la nature et de la vie, Université Djillali Liabès, Sidi Bel Abbès. 22000, Algérie.

ABSTRACT
The present work concerns the study of the adventitious flora of the cereal agro-systems in Tessala region (Western Algeria). The bioclimatic analysis confirms that the climate of the region belongs to the semiarid bioclimatic floor even arid, favouring so the regression of vegetable cover. Within fifteen notings down floristiques performed in the region of study, one took a census 68 types and 86 kinds belonging to 26 different families. On plan floristique five families dominate the listed adventitious flora: Asteraceae, Poaceae, Brassicaceae, Apiaceae and Fabaceae. The biological spectrum showed us a clear dominance of therophytes and of biogeographical point of view, the Mediterranean element is predominating. Correspondence analysis (CA) revealed us that the distribution of the groupsof weeds in the region of study is subjected to the agronomical, bioclimatic and édaphiques factors.

Key words: Inventory, adventitious flora, cereals, CA, Tessala (Western Algeria).

Received 3 January 2016; accepted 26 March 2016; published 31 March 2016

Address For Correspondence:
Megherbi-Benali Aicha, *Laboratoire écodéveloppement des espaces, Département des sciences de l'environnement, Faculté des sciences de la nature et de la vie, Université Djillali Liabès, Sidi Bel Abbès. 22000, Algérie*1.

INTRODUCTION

Among many enemies of cultures, the weeds occupy a very important place. A weed is an herbaceous plant or, by extension, a woody plant which, in the place where it is undesirable. Adventitious term is recognized as synonym, although botanical sense is different, it means a plant accidentally introduced without the knowledge of man [2]. In Algeria, cereal crops, leguminous plants pay every year a heavy tribute because of their invasion by a multitude of adventitious plants. The losses of outputs are evaluated at 24.5 % and can go up to 39.5 % in case of strong infestations [20].

Algeria has one of the flora the most diversified and most original of the Mediterranean basin.

This flora counts 3139 species distributed in nearly 150 families among whom 653 species is endemic, that is a rate of 12,6 % of endemism. By considering only the sector oranais, this one keeps about 1780 vegetable species of the total Algerian flora or, about 57 % Algerian floras, but 95 % Maghrebi Mediterranean floras, this last counting 1865 species according to Quézel [31], [24].

About 14 %, that is 250 species of these floristic elements, are listed at the flora of Quézel and Santa [33,34] as strictly pledged in cultivated plots. It was noted on a worldwide scale that the techniques of intensive farming (phytosanitary treatments, mechanization, reduced use of the fallow, the industrial sorting of seeds) drove to impoverishment floristique of cultivated fields while lands on extensive agricultural conditions constitute the contrary shelters for adventitious species [14,21].

To Cite This Article: Megherbi-Benali Aicha, ZOUAOUI Sofiane Abderrahim, TOUMI Benali Fouzia, DIF Mustapha Mahmoud, HAMAL Laid., Inventory of the adventitious flora in a cereal agro-system in the plain of Tessala (Western Algeria). **Glob. J. Biodivers. Sci. Manag,** 6(1): 1-13, 2016

Global journal of biodiversity science and management, 1(6) January 2016, Pages: 1-13

The knowledge of the composition of the adventitious flora and of its evolution with culturales practices is a precondition necessary to very perfecting of integrated pest strategies. This is why, for several years already, a floristico-ecological studies were undertaken in different regions of Algeria [7,5,13,1,12]. These regional studies allowed a better knowledge of constitution and of distribution of the adventitious flora. [23].

However the agricultural regions of the country which are not explored yet are numerous. It is particularly the case of Oranie that is however a cereal and wine zone of the utmost importance.

Located in the north of the region of Sidi Bel-Abbes, the village of Tessala by its geographical situation and its remarkable climate gives a favourable middle for development and multiplication of the species vegetable and in particular the adventitious ones

The lands of the region remain marked by an extensive traditional agriculture (mixed-farming, animal husbandry, fallow) where still continues the practice of the common grazing on stubble after harvests although current economic constraints push many farmers of the region to be modernised and to adopt more intensive practices, factor of the regression of the spontaneous flora of fields.

In this work, we will study the different botanical aspects that introduces the flora adventitious of cereal agrosystems of the region (Tessala) by characterising it from point of view taxonomic, phytogeographical and biological. Knowing that if a better knowledge of the arvicole flora allows the development of plans of integrated pest, it also helps to protect it better.

I. Zone and methods of study:

I.1. Zone of study:

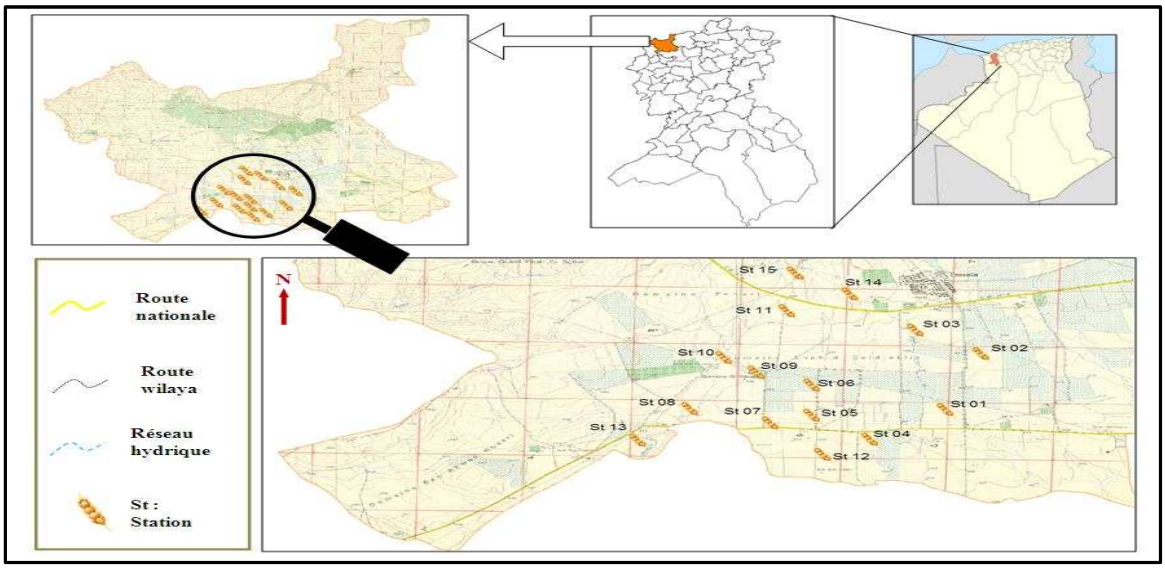
In part its geographical situation, the region of Tessala introduces a big biological diversity from its geographical and orographical localization. It is located at the north of the wilaya of SidiBel - Abbots, limited to the north by the plain of Mleta and the sebkha of Oran, in the East by the mounts of BéniChougrane, on the West by the mounts of SebaaChioukh and in the south by the plain of SidiBel' Abbots. The mount of Tessala is part of the tellien Atlas (fig 1), its climax is in 1 061 m of altitude [25].

Climate is of semiarid Mediterranean type with fresh winter, with annual medium pluviometries from 335 to 400 mm. The annual medium temperatures are included between 8,33 °C and 26,11 °C. The minimal medium temperatures of the coldest month oscillate between 2 °C and 4 °C and the averages of the maximum of the month the hottest surplus seldom 30 °C [4].

I.2 Methods of study:

** selecting stations:*

For the study of vegetation, we kept method stigmatize [6]. With this effect, 15 stations located on the southern slopes (face 1), were selected by taking into account the exhibition of the ground and the vegetation physiognomy, according to conception of the phytoecology.



Pic. 1: Geographical Situation of the region of Tessala and location of the sampled stations.

I.3. Inventory and analysis of vegetation:

The study of vegetation was carried out by the method of notings down floristics of Braun Blanquet [6] who consists in choosing typical sites, in noting the environmental conditions and list the present species. Notings

Global journal of biodiversity science and management, 1(6) January 2016, Pages: 1-13

down floristics were carried out during spring period (April-May, 2015) when vegetation is in its optimum development on quantitative and qualitative plans. Determination of taxa was made from the new flora of Algeria and of southern desert regions of Quézel and Santa [33,34].

To answer the objective of our research, we made 15 phytosociological notings down on all selected stations. Every noting down was taken on a surface of floristically homogeneous vegetation, not offering a variation of appreciable floristic composition between its different parts [17]. More precisely, this important concept for the quality of information was associated to that of the minimum area described by Gounot [17]. Indeed, we established an aeea of a square metre by counting the vegetable species contained in this square. We doubled this surface every time and note new appeared species, to the point of finding no more new species. In our case, notings down were performed on square area of 64 m2 (8m x 8m).

All the species present in noting down, are noted by allotting each one of it a coefficient of abundance - dominance. Abundance is the number of individuals represented by a species and a dominance the surface occupied by the same species. There are several ladders of abundance - dominance. One of the most using is those of Braun-Blanquet. It is presented below:

+: covering and very low abundance;
1: abundant species, but weak covering (<5 %);
2: very abundant and covering from 5 to 25 %;
3: any abundance, covering from 25 to 50 %;
4: any abundance, covering from 50 to 75 %;
5: covering higher than 75 %.

1.4. Soil analysis:

Study was accompanied by a pedological study for all stations selected. The samples were taken at the surface horizons, and on a depth varying from 10 to 30 cm (Every sample consists in taking about 1000g of raw earth).

I.5. Correspondence Analysis CA:

The correspondence analysis (C.A) is a holistic approach which allows to get a synthetic vision of links between species or between species and the environmental factors. This analysis also gives other big possibilities. Indeed, she allows to jointly treat floristic variables and ecological variables [10].

To specify the relations of species with the preponderant environment factors, we performed two types of C.A:

• C.A species - notings down.

• C.A species - notings down.-factors, which changes the first one involving the role of environmental variables; this analysis is called canonical analysis, crossing the contingency table species - notings down with the disjunctive table - factors [26].

RESULTS AND DISCUSSION

2.1. Soil Analysis:

The average relating values to the different characteristic physicochemical parameters of the surface horizon of the soil corresponding to the fifteen selected stations are represented in the table 1.

All the analyzed samples of soil are characterized by appreciable percentages of silts, of sands; while clays and are slightly present. For the texture of the soil, eight stations are silty-sand (St 2, St 3, St 4, St 8, St 10, St 11, St 12 and St 13), four station silty-clay (St 5, St 6, St 7 and St 14), two stations clayey-silt (St 1 and St 9) and and one station silty (St 115). The WP is slightly alkaline in all stations, even neighboring of neutrality.

The total limestone rate wobbles between 0.1 % and 32.5 % with existence of three classes of soil: highly calcareous soil (St 6 and St 14) and moderately calcareous soil (St 5 and St 13); the others are poor. Contents of active limestone wobble between 7.3 % and 12.8 %.

For the content of organic matter, two stations (St 6 and St 14) are rich with respective values of 4,62 % and 4,68 %; nine stations (St 1, St 2, St 4, St 5, St 8, St 9, St 10, St 12 and St 13) are moderately rich recording percentages included between 2,3 % and 3,2 % and three stations (St 3, St 11 and St 15) is poor, with a lower than 2 % there.

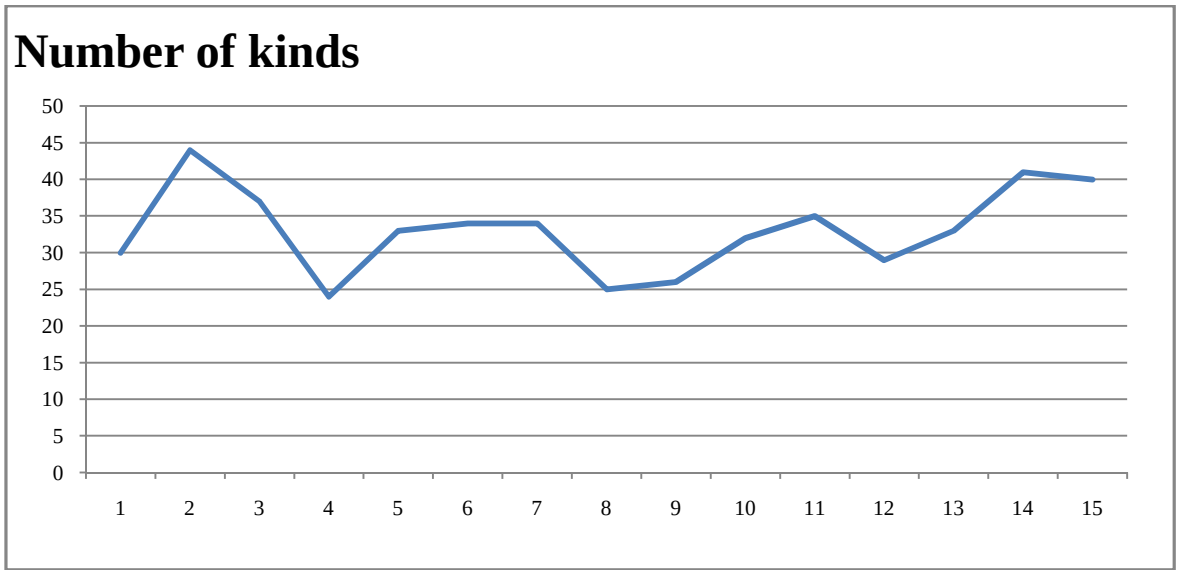
Table 1: Results of the physicochemical analyzes for the different soil samples collected

Samples	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Sandy (%)	15	30	40	30	20	20	20	40	13	35	30	25	25	20	15
Slimy (%)	50	55	35	55	65	65	65	48	55	55	50	60	55	60	70

Clayey (%)	35	15	30	15	15	15	15	12	32	10	20	15	20	20	15
Texture	Cl.Sl	Sl.Sa	Sl. Sa	Sl. Sa	Sl. Cl	Sl. Cl	Sl. Cl	Sl. Sa	Cl. Sl	Sl. Sa	Sl. Sa	Sl. Sa	Sl. Sa	Sl. Cl	Sl
WP	6.55	6.66	6.63	6.64	6.61	6.63	6.64	6.64	6.4	6.60	6.64	6.65	6.69	6.65	6.65
Cal total%	6.4	4.0	6.4	3.6	11.6	32.4	4.8	0.1	6.1	4.2	6.5	3.8	12	32.5	5.0
Cal actif %	7.5	7.5	8.5	7.25	12.5	11.0	8.37	10.0	7.8	7.3	8.2	7.50	12.8	10.4	8.40
OM	2.67	2.67	1.54	3.08	3.10	4.62	1.77	2.30	2.65	2.65	1.55	3.20	3.20	4.68	1.8

2.2. Floristic Analysis:

We have inventoried 86 adventitious species within notings down in different plots. This diversity is due on one hand to the wealth of the national flora (3 300 species) and regional and, on the other hand, to the very weak degree of intensification attained by agriculture as well as minimal use of weed killers. The diversity fragmented specific for all notings down is medium, it varies from 24 to 44 species with an average of 34 species / noting down (Figure 2). The distribution is rather homogeneous with the single peak, what translates a sharing out balanced enough by species on all notings down.



Pic. 2: Floristique fragmented wealth.

The floristic analysis of the inventoried adventitious flora was carried out on the taxonomic levels, biological and biogeographic.

1. taxonomically, the totality of listed species are angiosperms linked to 26 botanical families and 68 different types among which:

- 1 family, 6 genus and 9 species of the class of Monocotyledons;
- 25 families, 62 genus and 77 species of the class of Dicotyledons.

Table 2 indicates the nature and classification of families met according to their relative importance.

Table 2: The different families met in the adventitious flora and their contribution.

Family	Types / species	%
Apiaceae	*Ammi visnaga* Lamk., *Bupleurumlance folium* Horn., *Daucus gummifer* Lamk., *Foeniculum vulgare* Miller., *Ridofolia segetum* Moris., *Scandis pecten-veneris* L., *Torilis nodosa* Gaertn.,	8.13
Asteraceae	*Anacyclus clavatus* (Desf.) Pers, *Calendula arvensis*L., *Calendula bicolor* Raf., *Cardius pycnocephalus* L., *Centaurea diluta* Ait., *Centaurea eriophora* L., *Centaurea jacea* L., *Centaurea napifolia* L., *Centaurea nicaeensis* All., *Centaurea solstitialis* L. *Chrysanthemum coronarium* L., *Cirsium syriacum (*L.) Gaertn., *Crepis visicaria* L., *Hypochoeris glabra* L., *Mantisalcasal montica* (L.) Brig.et Cavill., *Onopordonmacra canthum* Schousb. *Silybummurianum* (L.) Geartn., *Sonchusoleraceus* L., *Xanthium spinosum* L.,	22.09
Borraginaceae	*Anchusa azurea* Mill., *Echium plantagineum L., Heliotropium europaeum* L.	3.48

Global journal of biodiversity science and management, 1(6) January 2016, Pages: 1-13

Brassicaceae	*Brassica nigra (L) Koch., Caspella bursa-pastoris L., Diplotaxis erucoides* (L.) DC., *Diplotaxis virgata DC. Lepidium draba* L., *Raphanus raphanistrum L., Sinapis alba L., Sinapis arvensis*L.	9.03
Caryophyllaceae	*Arenaria serpyllifolia* L., *Silene fuscata* Link., *Silene rubella* L., *Vaccaria pyramidata* Medik.	4.65
Chenopodiaceae	*Chenopodium vulvaria* L.	1.16
Cichoriodeae	*Scolymushis panicus* L., *Urospermum picroides* (L.) *Schmidt*	2.32
Convolvulaceae	*Convolvulus althaoeides* L., *Convolvulus arvensis*L.	2.32
Fabaceae	*Medicago truncatula* Gaertn. *Melilotus infesta* Guss., *Trifolium tomentosum* L., *Vicia monantha* Retz, *Vicia sativa* L., *Vicia villosa ssp. Desycarpa* (Ten.) Cavil,	6.97
Geraniaceae	*Erodium muschatum* (Burm.)	1.16
Iridaceae	*Bellevallia ciliata* Lapeyr.	1.16
Lamiaceae	*Lamium amplexicaule* L.	1.16
Liliaceae	*Ornithogalumnar bonense* (L.) Asch et Gr	1.16
Malvaceae	*Althaea longiflora* Boiss. et Reut.., *Malva sylvestris* L.	2.32
Oxalidaceae	*Oxalis pes-caprae*	1.16
Papaveraceae	*Fumaria officinalis* L., *Fumaria parviflora* Lamk., *Glaucium corniculatum* Curtis., *Papaver hybridum* L., *Papaver rhoeas* L.	5.81
Plantaginaceae	*Plontago logopus* L., *Plantago lanceolata* L.	2.32
Poaceae	*Avena sterilis* L., *Bromus hordeaceus* L., *Bromus rubens* L., *Bromus sterilis* L., *Hordeum murinum* L. *Lagurus ovatus* L., *Lolium multiflorum* Lamk., *Phalaris canariensis* L., *Phalaris paradoxa*L.	10.46
Polygonaceae	*Polygonum aviculare* L.	1.16
primulaceae	*Anagallis arvensis subsplatifolia* (L.) Br.Bl. et M., *Anagalis monelli* L.	2.32
Renonculaceae	*Adonis aestivalis* L., *Ranunculus arvensis* L.	2.32
Resedaceae	*Reseda alba* L.	1.16
Rosaceae	*Sanguisoraba minor* Scop.	1.16
Rubiaceae	*Asperula arvensis* L.,*Galiumt ricorne* Witth.	2.32
Solanaceae	*Datura stramonium* L.	1.16
Urticaceae	*Urticadioica*L.	1.16

Five families clearly dominate the inventoried adventitious flora: Asteraceae, Poaceae, Brassicaceae, Fabaceae and Apiaceae. They capitalize on their own 49 or 57 % total enrolments (fig 3).

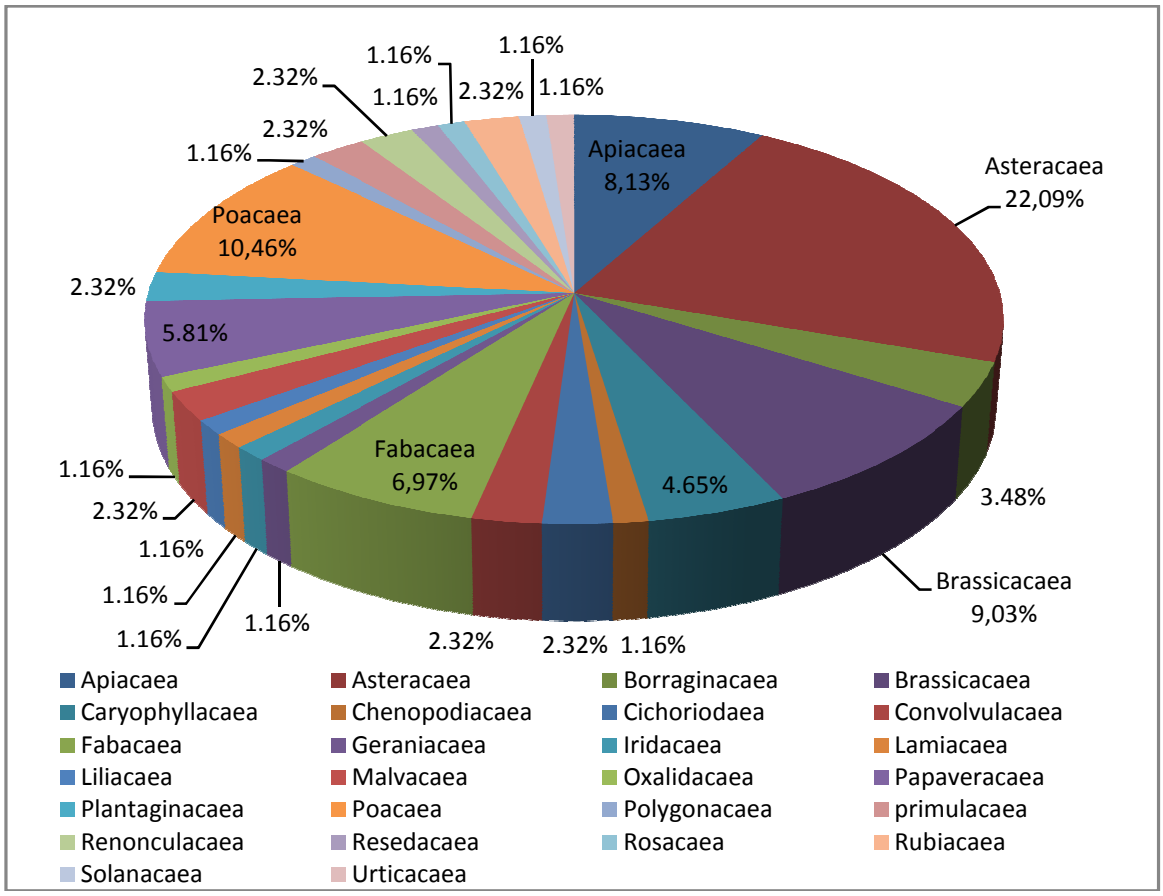


Fig. 3: Systematic Composition of the principal families.

Global journal of biodiversity science and management, 1(6) January 2016, Pages: 1-13

2. Biologically, life forms of plant representatives a tool favored for the description of the physiognomy and of the structure of vegetation. The biological type of a plant is the result, on the vegetative part of its body, all biological processes including those which are modified by the environment of during the life of the plant and are not hereditary [30].

Romane [35] recommends the use of the biological spectra as indicators of the distribution of morphological characters and probably physiological characters.

Biological types met on the level of the inventoried adventitious drills are expressed in the table3.

Table 3: Different biological types of the listed adventitious drills.

Type biological	Types / Kinds	%
Hemicryptophyts	*Althaea longiflora*Boiss. et Reut., *Cardiuspycnocephalus*L ,*Centaureanicaeensis All., Crepisvisicaria*L., *Daucus gummiferLamk.,., Erodiummuschatum (Burm.)* L, *Foniculumvulgare (Mill.)* ,*LoliummultiflorumLamk., Malvasylvestris*L , *Mantisalcasalmontica* /L./*Brig. et Cavill., Melilotus infesta Guss., Onopordon macracanthum*Schousb., *Plantagolagopus*L., *Plantagolanceolata*L., *Reseda alba* L., *SanguisorbaminorScop., Scolymushispanicus*L., *Silybummurianum (*L.*) Geartn.,*	20.93
Geophyts	*BellevalliaciliataLapeyr., Convolvulus althaeoides* L., *Convolvulus arvensis*L.,*Ornithogalumnarbonense (*L.*) Asch et Gr, Oxalis pes-caprae, Urticadioica L.*	6.97
Therophyts	*Adonis aestivalis*L., *AnacyclusclavatusDesf., Anagalisarvensis*L., *Anagalismonelli*L., *Anchusaazurea Mill., Arenariaserpyllifolia*L., *Asperula arvensis*L., *Avenasterilis*L., *Brassicanigra (*L*) Koch., Bromushordeaceus*L. *Bromusrubens*L., *Bromussterilis*L., *Bupleurumlancefolium Horn., Calendula arvensis*L., *Calendula bicolor Raf., Caspellabursa-pastoris*L., *Centaureadiluta Ait., Centaureaeriophora*L., *Centaureajacea*L., *Centaureanapifolia*L., *Chenopodiumvulvaria*L., *Chrysanthemumcoronarium*L., *Cirsium syriacum (*L.*) Gaertn., Datura stramonium* L., *Diplotaxiserucoides (*L.*) DC., Diplotaxisvirgata DC., Echiumplantagineum*L., *Fumariaofficinalis*L., *FumariaparvifloraLamk., Galium tricorne Witth., Glauciumcorniculatum Curtis., Heliotropiumeuropaeum*L., *Hordeummuriùum*L., *Hypochoerisglabra*L., *Lagurusovatus*L., *Lamium amplexicaule* L., *MedicagotruncatulaGaertn., Papaver rhoeas*L., *Papaver hybridum*L., *Phalaris canariensis*L., *Phalaris paradoxa*L., *Polygonumaviculare*L., *Ranunculusarvensis*L., *RidofoliasegetumMoris., Scandis pecten-veneris*L., *Silenefuscata Link., Silenerubella*L., *Sinapis alba* L., *Sinapisarvensis*L., *Sonchusoleraceus*L., *TorilisnodosaGaertn., Urospermumpicroides (*L.*) Schmidt, VaccariapyramidataMedik., Vicia monantha Retz, Vicia sativa*L., *Vicia villosassp. Desycarpa (Ten.) Cavil, Xanthiumspinosum*L.,	72.09

Three biological types characterize the adventitious flora listed, with a net predominance of therophytes (72.09 %). Hemicryptophytes comes in second place with 20.93 %,geophytes is the least representing with 6.97 % (Fig 4).

In more detail, table 3 shows a extremly high number of therophytes or about 70 % complete enrolments. These annual species appear each year due to the redistribution of the seed stock by plowing. Progressive point of view, but also its distribution, this biological type represents the current expression of the adaptation to productive and unsettled habitats.

In spite of the importance of therophytes, hemicryptophytes keeps a rather important place (about 20 %). They are particularly present in relatively stable environments, in the periphery of fields, waiting for a reduction of tillage to get into cultivated plots. This pivotal group between therophytes and geophytes can pass from a type to other one according to conditions suffered during their development. Tillage is then the best indicator of biology, because it spares only geophytes [21].

Geophytes comes to the third rank and contribute about 7 %. Remember that with therophytes, geophytes represents groups most improved in the classification of Raunkiaer [21]. From agronomical point of view, in a not much worked soil geophytes and species with preferential vegetative multiplication are distinctly abundant [9].

Global journal of biodiversity science and management, 1(6) January 2016, Pages: 1-13

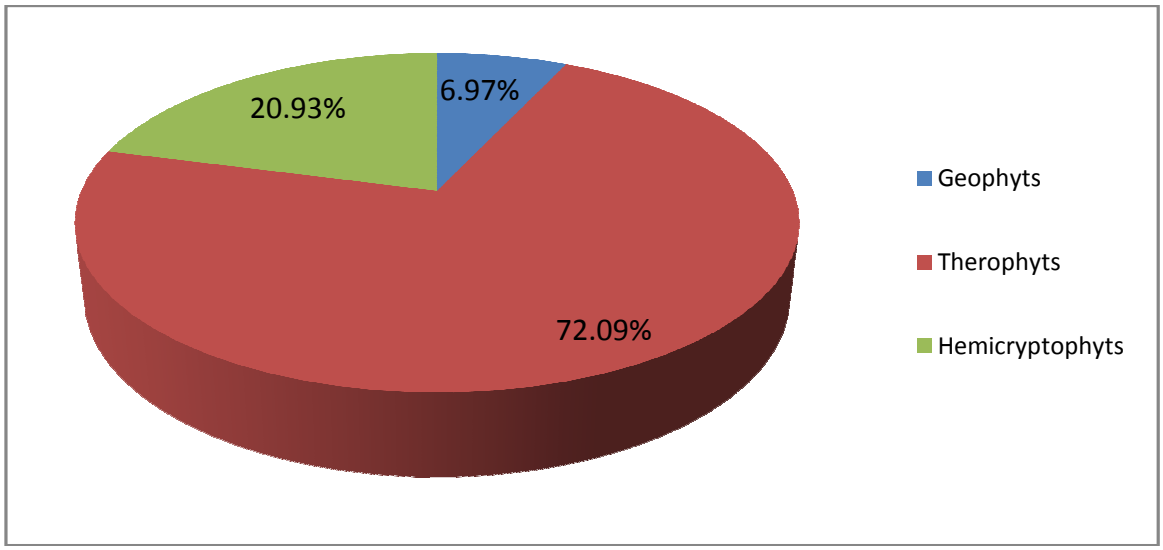


Fig. 4: Spectrum biological of drills adventitious inventoried.

3. geographically, climate includes the factors of distribution of the plant, its drastic variation during geological area in a given zone is at origin to a great extent the distribution of its current flora; what reflects the biogeographical heterogeneity of this zone. The flora of the Mediterranean basin constitutes a true model to interpret the phenomena of decline [29]. The biogeographical composition of the listed adventitious flora is illustrated in the table 4.

Table 4: Biogeographical distribution of adventitious species listed.

Type biogeographical	Types / Kinds	%
Algeria - Morocco.	*Centaurea diluta* Ait.	1.16
Canary Islands, Sicily, Greece, Africa	*Calendula bicolor* Raf.	1.16
MediterraneanCircum	*Ornithoga lumnarbonense* (L.) Asch et Gr	1.16
Circumboreale.	*Hordeum murinum* L.	1.16
Cosmopolite.	*Datura stramonium* L., *Lamium amplexicaule* L., *Polygonum aviculare* L., *Silybum marianum* (L.) Gaertn. *Sonchusoleraceus* L.,*Urticadioica.*	6.97
End.	*Hypocho erisglabra* L.	1.16
The Mediterranean East	*Bellevallia ciliata* (Cyr.) Nees	1.16
Euro-Mediterranean	*Anacyclus clavatus* (Desf.) Pers, *Anchusa azurea* Mill., *Crepis visicaria* L., *Heliotropium europaeum* L., *Mantisalca salmontica /L./Brig. et Cavill., Scandis pecten-veneris* L., *Vicia sativa* L., *Vicia villosas sp. Desycarpa (Ten.) Cavil.*	9.03
Eurymedon.	*Urospermum picroides (L.) Schmidt*	1.16
Eurasian	*Adonis aestivalis*L., *Arenaria serpyllifolia* L., *Brassica nigra* (L) *Koch., Cardius pycnocephalus* L., *Convolvulus arvensis*L., *Lepidium draba* L., *Malva sylvestris L Plantago lanceolata L., Reseda alba L., Sanguisor baminor Scop., Torilis nodosa Gaertn.*	12.79
Italy. A.N.	*Centaurea solstitialis* L.	1.16
IberianMorocco.	*Centaurea eriophora* L., *Diplotaxis virgata* DC., *Onopordonm acracanthum* Schousb.	3.48
Macar-Mediterraneans / Irano-touraniens	*Avena sterilis* L., *Convolvulus althaeoides L, Phalaris canariensis* L.	3.48
Mediterranean	*Ammivisnaga* Lamk., *Asperula arvensis L., Bupleurum lancefolium Horn. , Caspella bursa-pastoris L., Chrysanthemum coronarium L., Cirsiumsyriacum (L.) Gaertn.,Daucusgummifer Lamk., Diplotaxis erucoides (L.) DC., Echium plantagineum L., Erodium muschatum (Burm.) L'Her, Foniculum vulgare (Mill.) Gaertn., Fumaria parviflora Lamk., Glaucium corniculatum Curtis.,., Papaver hybridum L., Phalaris paradoxa L., Plantago lagopus L., Raphanus raphanistrum L., Ridofolia segetum Moris., Scolymus hispanicus L., Silene fuscata Link., Silene rubella L., Trifolium tomentosum L., Vaccaria pyramidata Medik., Vicia monantha Retz, Lolium multiflorum* Lamk., *Medicago truncatula* Gaertn.	33.76
MediterraneanEuropean	*Chenopodium vulvaria* L., *Galium tricorne* Witth.	2.32
Paleo-Tempere	*Bromus hordaceus* L., *Bromus sterilis* L., *Fumaria officinalis* L., , *Sinapis alba* L.,*Sinapis arvensis* L., *Papaver rhoeas* L. *Ranunculus arvensis* L.	8.13
Paleo-Subtropicale	*Bromus rubens* L.	1.16
Sub-Cosmopolite	*Anagallis arvensis* L. ,*Xanthium spinosum* L.	2.32

Global journal of biodiversity science and management, 1(6) January 2016, Pages: 1-13

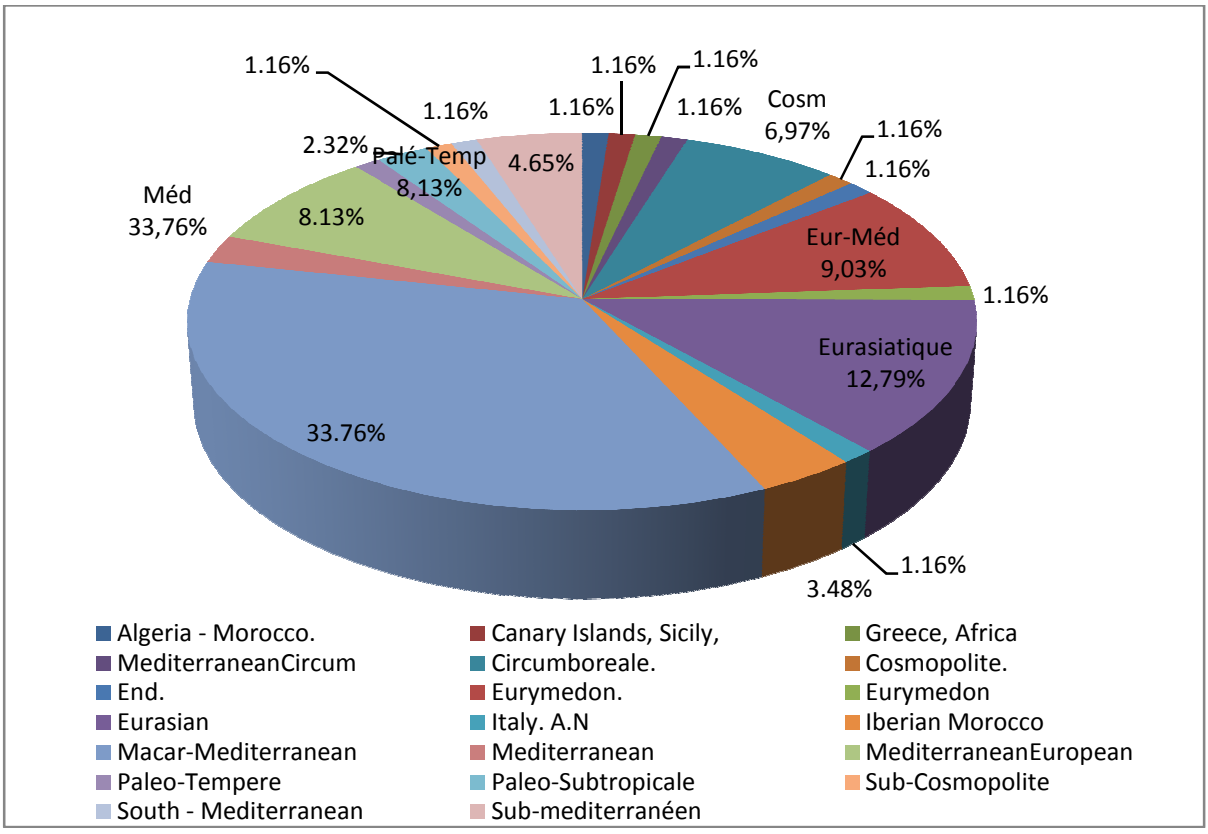
South - Mediterranean	*Melilotus infesta* Guss.	1.16
Sub-mediterranean	*Calendula arvensis* L.	1.16
West Mediterranean	*Althaea longiflora* Boiss. and Reut., *Anagallis monelli* L., *Centaurea napifolia* L., *Centaurea nicaeensis* All.	4.65

On plan phytogéographic, adventitious flora listed is constituted by heterogeneous group of elements of various Mediterranean, northern and southern origins. Indeed, 86 species of the floristic list are divided into 21 biogeographic classes (fig. 5).

Apart from the floristic elements in the Mediterranean basin, we meet species of various origins: Tropical European, Paléo.

The analysis of table 3, allowed us to point out the predominance Mediterranean biogeographical type of species in the floristique procession with a 33.76 % percentage. We also note the elements biogeographic according to: Eurasian (12.79 %), Mediterranean Europeans (9.03 %), tempered Paléo (8.13 %), Cosmpolite (6.97 %) and Mediterranean West (4.65 %).

Mediterranean species (including the Mediterranean / Eurasian biregional, Mediterranean / Iranian-Turanian) allocate in the adventitious flora about 51 % of its species. The Western Mediterranean elements are represented by 4 species is 4,65 % complete enrolments. These figures confirm well the membership of the territory studied in the Mediterranean flora (table 3). However, this percentage is slightly less than that established by Loudyi [27] at the level of Moroccan agriculture (61,2 %). We find here the observations of Emberger [11] according to him Morocco is the most Mediterranean country of the North Africa [23].



Pic. 5: Biogeographic spectrum of adventitious flora inventoried.

The systematic composition of the inventoried flora is diversified enough. twenty-six families were listed. The best represented families are Asteraceae, Poaceae, the Brassicaceae, the Apiaceae and Fabaceae.

The biological study accomplished at the level of inventoried flora showed that the distribution of biological types are marked by a net predominance of therophytes (more than 70 %).

Wild [36], Gaussen, Negro [28], Daget [8], Barbero and et al., [3] introduce the therophytie as being a form of resistance to dryness, as well as to high temperatures of arid environments ultimate degradation stage [32]. Also Floret and et al., [15] signal that more a system is influenced by the man (overgrazing, culture), more therophytes gets importance from it.

On the phytogeographical level, adventitious flora listed is constituted by heterogeneous group of biogeographical elements with a dominace of the mediterranen element (more than 30 %).

Global journal of biodiversity science and management, 1(6) January 2016, Pages: 1-13

2.3. Statistical data analysis:

On all the 86 species of adventitious included in the correspondence analysis (CA) and hierarchical cluster (HC), species are encoded by alphanumeric order for a presentation of results.

Results got by hierarchical cluster (HC) synthesize the groupings of notings down according to weed species. It highlights three sets I, II and III. Each set counts 5 notings down (Fig 6).

The figure 7 synthesizes with it the groupings of weed species according to notings down, it shows the existence of five groupings of species A, B, C, D and E.

For results got by the correspondence analysis, it emerges from CA taking into account either all notings down, or species, that factorial plan 1-2 contains the basics of information. The cumulative percentages of inertia absorbed by first two axes is 37.806 % (with 22,7395 and 15,0678, respectively for axis 1 and 2). These values indicate homogeneity of floristic lists.

The examination of the factorial card constructed with axes 1 and 2 (fig 7) allows to delimit three very distinct sets I, II and III.

The examination of the factorial card of species established with axes 1 and 2 (figure 8), allowed us to differentiate five groupings of species. In the positive part of both axes we have the groupings E, B and C. In the negative part of the axis 2, we find the grouping of species A while the D grouping occupies a negative part in the axis 1.

To see on which base floristic rest the groupings of highlighted notings down, we make comply the factorial cards of notings down and those of species. Cards notings down species allow a visualization of existing affinities between the groups of notings down and the groups of species.

The analysis of cards relating to axes 1 and 2 (Figure 9), brings to light following correspondence:

1. The groupings of species C and B correspond to the group of notings down II.

2. The grouping of species A corresponds to group III, while both groupings of species D and E correspond to group II.

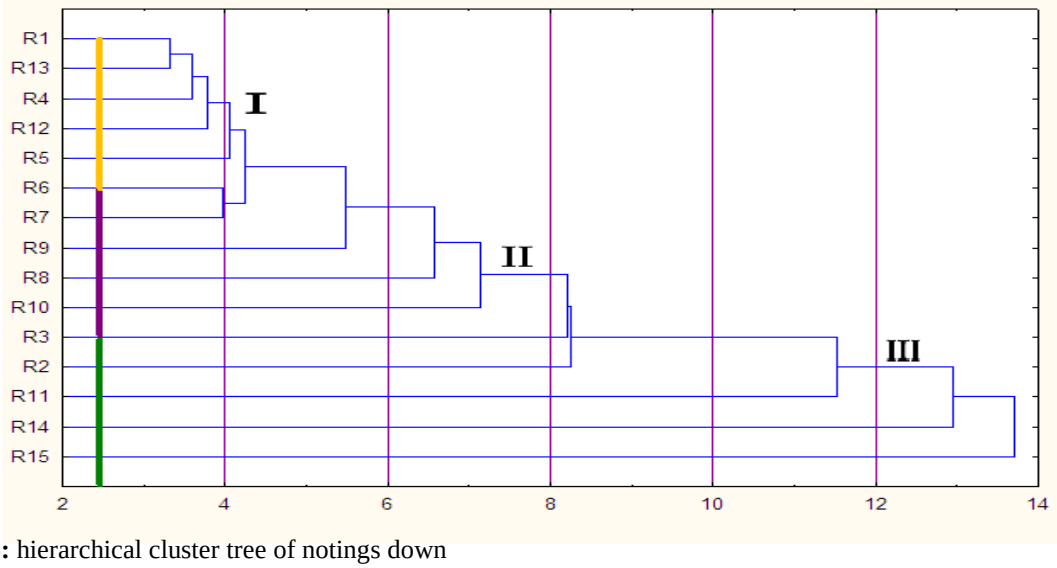


Fig. 6: hierarchical cluster tree of notings down

Global journal of biodiversity science and management, 1(6) January 2016, Pages: 1-13

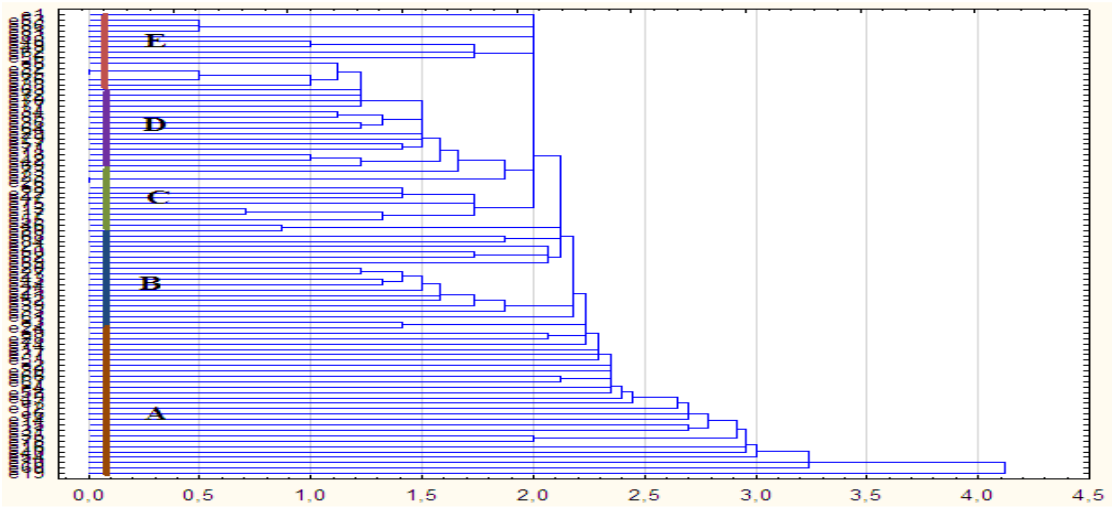


Fig. 7: hierarchical classification tree of the species.

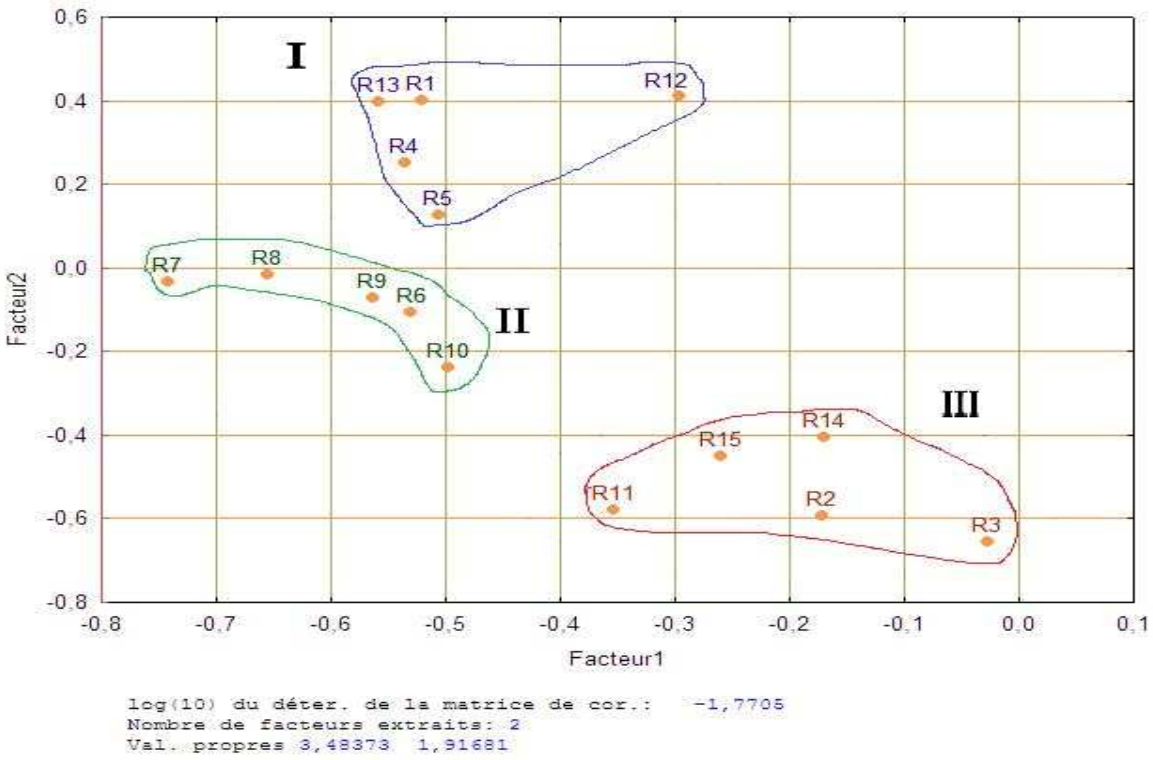


Fig. 8: Delimitation of the groups of notings down.

Global journal of biodiversity science and management, 1(6) January 2016, Pages: 1-13

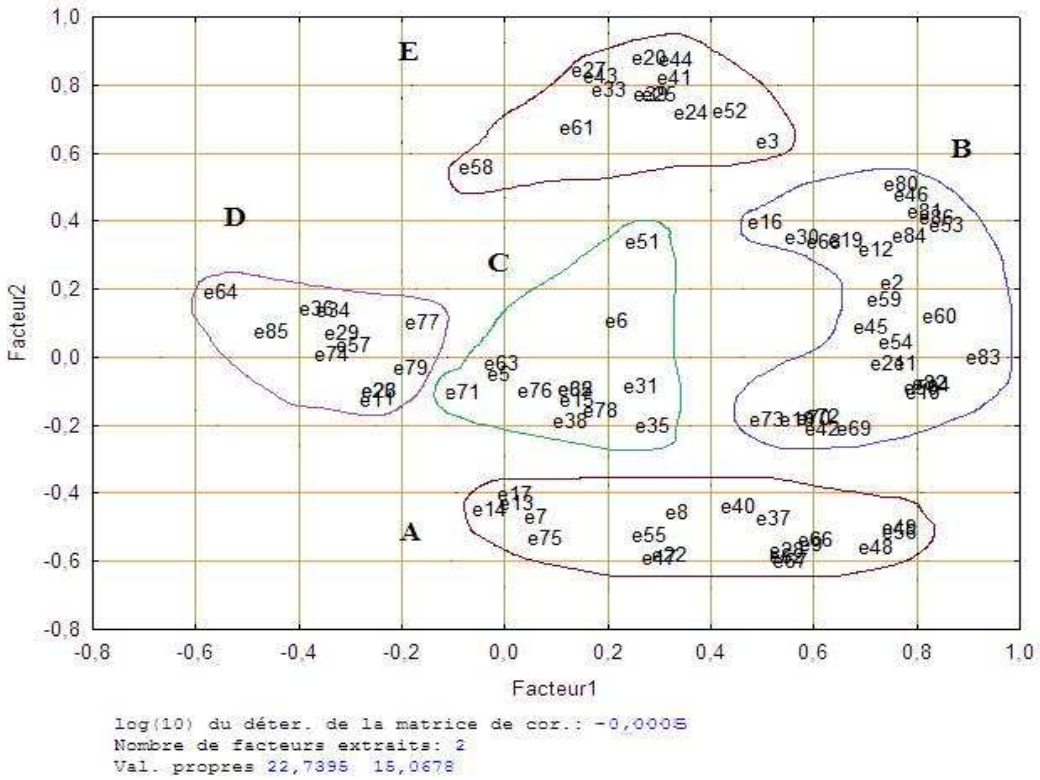


Fig. 9: Delimitation of species groups.

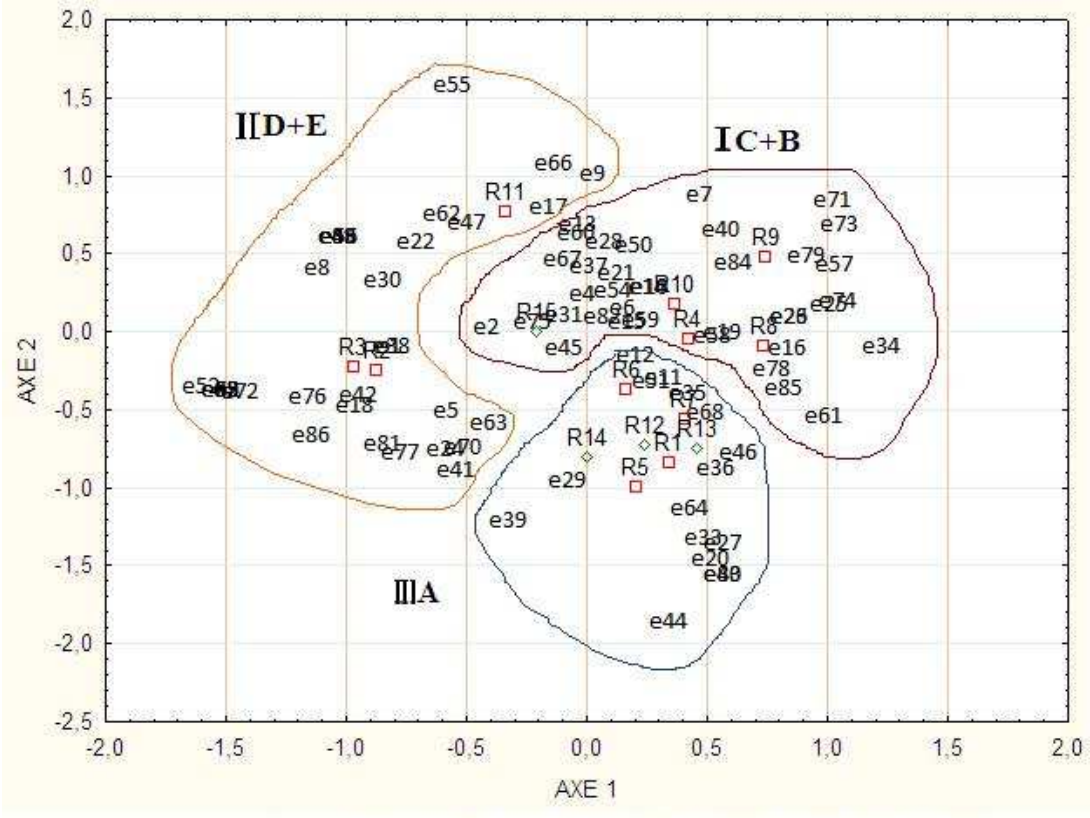


Fig. 10: Delimitation of groupings species on axes 1 and 2.

Global journal of biodiversity science and management, 1(6) January 2016, Pages: 1-13

The interpretation of axes returns to search the reasons which compare notings down (or species). It is done by the species whose ecology is more or less known and also by the study of the agro-ecological conditions of stations noted during the realization of notings down.

The contributions of notings down and of species to horizontal axis 1 of the correspondence analysis, allow to show that species and notings down accomplished during the period of March, April, the beginning of May which are distributed along axis 1 of the positive side are opposed to species and notings down during period the end of May - June located on the other side of the axis. Therefore, it opposes the species to winter and spring germination in species with pre-summer germination in summer. Besides the period of realization of notings down, the distribution of notings down species along this axis seems also related to agronomic factors such as tillage, crop type, fertilization and weeding. Axis 1 expresses two gradients therefore to be known: the date of notings down and the agronomic factors.

At axis 2, the factorial cards show opposition between the relatively dry stations which split along the axis in the positive part, and those rather humid in very humid located by the negative side. Notings down and species also split along axis 2 in the higher part depending on whether they are accomplished on a soil with clay texture in clay-loam in opposition to species and notings down accomplished on soil with silty-sandy and sandy texture of the negative side of the axis. The same axis opposes the stations of mountains, sets and hills in the stations of plains.

The axis 2 expresses three gradients therefore: bioclimatic, edaphic and geomorphologic.

The axis 3 can be interpreted as a gradient of slope since it compares stations in slopes located by the negative side and those in any slopes located by the positive side of the axis.

It appears therefore that the distribution of the groupings of weeds in our region of study is mainly subjected to the influence of the factors: agronomic (cultural practices and intensity of tillage), bioclimatic (bioclimatic and rainfall inputs), edaphic (type and soil texture) and geomorphologic.

Conclusion:

The bioclimatic study of Tessala region showed an inter- variability of rainfall with long dry season (about 6 months). The index of aridity of the region estimated at 13.12 determines a semi arid regime.

The use of the climagramme of EMBERGER allowed us to classify the village of Tessala in semi arid bioclimatic stage lower than fresh winter. This classification is based on an average of 25 years, which allowed us a reliable characterization of the climate of the region.

The phytoecological Notings down accomplished in fifteen (15) stations (plots) deductions have identify 86 species, belonging to 26 families among which Asteraceae, Poaceae, Brassicaceae, Fabaceae and Apiaceae.

On plan phytogeographical, the Mediterranean floristic element clearly dominates the listed of adventitious flora. Other biogeographic elements were disclosed: Eurasian, Mediterranean Europeans, Paleo tempered, Cosmpolite and West Mediterranean.

The distribution of biological types at the level of the adventitious flora inventoried in revealing a net predominance of therophytes.

The pedological study of the soil enabled us to better know the characteristics of the soil of the region. The soil of the region of study is acidulated and their texture introduces nevertheless common characteristics, which are the presence of silt as element prevailing as well as the presence of clay with quantities more at least important.

The results of the correspondence analysis showed that the distribution of the groupings of weeds in our region of study is mainly subjected to the agronomic influence of the factors (cultural practices and intensity of tillage), bioclimatic (bioclimatic and height of rainfall), edaphic (type and soil texture) and geomorphologic.

REFERENCES

1. Abdelkrim, 1995. Contribution in the knowledge of the groupings of bad grasses of the cultures of the sector of Algiers: Approach syntaxonomique and phénologique. Thesis doctorate Paris - south university, p: 151.
2. Bailly, R., J. Aguilar, A. Faivre-Amiot, J. Mimaud, G. Paitier, P. Cassedanne, E. Choppin De Janvry, F. Nail, 1980. Guide practices of defence of cultures. Ed. Acta Paris, p: 420.
3. BarberoMr, R. Loisiel and P. Quézel, 1990. The contributions of phyto-ecology in the interpretation of changes and disturbances led by the man on the Mediterranean forested ecosystems. Mediterranean forests, 2: 194-215.
4. BenyahiaMr, K. Benabdeli and K. Moueddene, 2001. Geology, pedology and systems of production in the mounts of Tessala (SidiBelAbbés). Magazine of Sciences of nature and of environment (Écosystems) 1): 70-75.
5. Boulfekhar, MN., 1989. Study of some grouping of bad grasses in the plain of Mitidja (northern Algeria).Memory of magister ENSA. Algiers. pp: 104.

6. Braun-Blanquet J., 1952. Applied Phytosociologie. Communication of international Station of géobotanique Mediterranean and Alpine, Montpellier, France: 156-161.
7. Chevassut, G., H. Abdelkrim and G. Kiared, 1988.Contribution in the knowledge of the groupings of bad grasses of the region of El-Harrach. Ann, Inst, Agr, Algiers, pp: 690-702.
8. Daget, P.H., 1980. A current element of the characterisation of the Mediterranean world: climate. Nav. Mons. P; H. pp: 10-126.
9. Delpech, R., 1980. Information brought by the bad grasses for the development of a diagnosis phytoécologiquestationel. 6th International Symposium Ecology and Biology of the bad grasses, Montpellier, pp: 251-261.
10. Djebaïli, S., 1984. Algerian steppe, phytosociologie and ecology. OPU, Algiers. pp: 171.
11. Emberger, L., 1954. A biogeographical classification of climates.Rec. Trav. Lab. Club foot. Géol. Zool. Univ. Club foot Montpellier, series. n°7. pp: 3-43.
12. FenniMr, J. Mallet, 1998. Evolution of the adventitious flora of winter cereals under the influence of practices culturales in the High sétifiennes (Algerian Northeast) Plains. - Pp. 189-196 in: 6th Mediterranean Symposium EWRS. - Montpellier
13. Fenni, Mr., 1991 - Contribution in the study of groupings messicoles High sétifiennes Plains. Thesis Magister. Univ. Sétif, pp: 142.
14. Filosa, D., 1997. The decline of messicoles in the Southeast of France. - Pp. 67-74 in: Dalmas, J. P. (éds): Is it Necessary to save the bad grasses? - Gap
15. Floret, C., M.J. Galan, The E. Flock h, G. Orshan and F. Romane, 1992. Dynamics of holmoak (Quercus ilex L.) coppies after clear cutting in southen France. Vegetation., pp: 99-100.
16. Laugh, N.H., 1963. Ecology and phytogéographie.Abbeys., pp: 952-972.
17. Gounot, Mr, 1969. Methods of quantitative study of vegetation.Masson. Paris., pp: 314.
18. Make up, J.P., 1977. Obviousness for the existence of three primary strategies in young plants and its relevance to ecological and evolutionary theory.Bitter. Nat., 111: 1169-1194.
19. Guinochet Mr, 1973. Phytosociologie. Masson, Paris, France, pp : 227.
20. Hanitet, K., 2012. The groupings of the adventitious of cultures in the region of Oran, Thesis of magister, University of Oran, pp: 07-26.
21. Jauzein, P.H., 1995. Flora of the cultivated fields.INRA Editions. Paris., pp: 898.
22. Jauzein P., 2001. Biodiversity of the cultivated fields: floristique enrichment. File of the environment of INRA, n°21, pp: 22.
23. KaziTani, C., 2011. Contribution in the study of the communities of adventitious of cultures of the sector phytogéographiqueoranais (Algerian northwest): Botanical, agronomical and phyto-ecological Aspects, Thesis of doctora, AbouBekrBelkaïd university, Tlemcen, pp: 226-228.
24. KaziTani, C., T. The Middle-class person and F. Munoz, 2009. Aspects floristiques of the flora of the fields of domain phytogéographiqueoranais (Algerian northwest) and persistence of rare and endemic kinds, Flora Mediterranea., 20: 5-22.
25. Kiekken, R., 1962. Geology and stratigraphy of the mounts of Tessala. Ed. Fouquet. Oran.
26. Lebreton, J.D., D. Chessel, R. Prodonation and Yoccoz, 1988. The analysis of relations kinds-circles by the canonical analysis of correspondence. ActaOecologia, Oecol. Gener., 99, n°1 and 2: 52-67, pp: 137-151.
27. Loudyi, M.C., 1985. Botanical and ecological study of the spontaneous vegetation of the farmlands of the set of Meknès (Morocco).3rd thesis cycle, USTL MONTPELLIE., pp: 149.
28. Negre, R., 1966. Thérophytes.Mem.Ploughshare.Club foot. F1. pp: 92-108.
29. Olivier, L., Muracciole, Mr and J.P. Ruderon, 1995. First balance sheet on the flora of the islands of the Mediterranean. State of knowledge and Observations Diagnoses Pet Proposal relating to the insular floras of Mediterranean by the participants in symposium of Ajaccio. Corsican.France (October 5--8th, on 1993) on the occasion of debates and conclusions. pp: 356-358.
30. Polunin, N., 1967. Eléments of botanical geography GanthierWillars. Paris. pp: 30-35.
31. Quézel, P., 2002. Reflexion on the evolution of flora and of vegetation in the Mediterranean Maghreb. - Paris.
32. Quezel, P., 2000. Reflexion on the evolution of flora and of vegetation in the Mediterranean Maghreb. Ibis Press. Paris. pp: 117.
33. Quézel, P., S. Santa, 1962. New flora of Algeria and of southern desert regions. NATIONAL CENTRE FOR SCIENTIFIC RESEARCH, I: 565.
34. Quézel, P., S. Santa, 1963. New flora of Algeria and of southern desert regions. NATIONAL CENTRE FOR SCIENTIFIC RESEARCH, volume II, Paris, France, p: 605.
35. Romane. F., 1987. Effectiveness of the distribution of forms of growth for the analysis of vegetation on a regional scale. Doctoral dissertation. Are. Science. Marseilles.
36. Wild Ch., 1960. Géobotaniques researches on the oak cork in Morocco. Doctoral dissertation. Montpellier. Jobs. Institute. Scientist. Chérifien. Botanicalseries, 21: 1-462.