FLORISTIC INVENTORY OF THE GUINEAN ZONE OF THE BOTANICAL GARDEN OF NGOLTONGO AT SINDIA IN THE MBOUR DEPARTMENT (SENEGAL)

ABSTRACT

Background:

The intertropical plant world has undergone and continues to undergo major destruction and/or transformation, both in terms of 'ecosystems' and their components. The demographic explosion on a global scale has accentuatedthese new spatial modifications, by encouraging the emergence of threats:fires, slash-and-burn agriculture, savannah fires; animal introductions, plant species introductions, anthropic actions, etc.Ex situ conservation issometimes the only chance of survival for threatenedspecies.

Aim:

The aim of the workcarried out was to make a floristicinventory of the Ngoltongobotanicalgarden in Sindia,

Results:

The inventory of the Guinean zone (CASAMANCE) shows a relatively diverse flora with 220speciesin 161genera and 57families. In order of importance, the Fabacaeae, Arecaeae, Malvaceae, Poaceae, Apocynaceae, Euphorbiaceae and Asteraceae are the best represented. The otherfamilies, which are lesswellrepresented (0.41% each), neverthelesscontribute to the diversity of the flora, particularly the monospecificfamilies (Asparagaceae, Cyperaceae, Musaceae, etc.).

We have notedthatsomefamilies are relativelyabundant in terms of the number of species: in the Dicotyledonous class, these are the FabacaeaeApocynaceae, Euphorbiaceae, Malvaceae and Rutaceae groups, with a total of 71 species.In the class of Monocotyledons, the Arecaeae are in the lead with 24 species, followed by the Poaceaewith 10 species.In addition, certain genera are relativelywellrepresented, including Ficus (7 species), *Cassia* (7 species) and *Euphorbia* (4 species).

Conclusion:

The NgoltongoBotanical Garden appears to be a site of high biodiversity due to the diversity of speciesplanted in a relatively large area. If itis to succeed in its conservation, education and scientificresearch missions, itistherefore important to consider :its protection against bush fires and the anthropics actions, labelling the feet of all plants and the construction of a seedbank to enable exchanges withotherbotanicalgardens.

Keywords: Botanicalgarden, Floristicinventory, Ngoltongo, Sindia

1. INTRODUCTION

Biodiversityis the totality of genes, species and ecosystem in a region. It is essential for humansurvival and economicwellbeing and for the ecosystemfunction and stability**[1]**. The total number of speciesavailable on the earthis not determinedyethowever, itis estimated that the total number of animal and plant speciescouldbebetween 13 and 14 millions**[2].** Conservation biologistswarnthat 25 percent of all speciescouldbecomeextinctduring the nexttwenty to thirtyyears**[3].**Indeed, the intertropical plant world has undergone and continues to undergo major destruction and/or transformation, both in terms of 'ecosystems' and their components. The demographic explosion on a global scale has accentuatedthese new spatial modifications, by encouraging the emergence of threats:fires, slash-and-burn agriculture, savannah fires; animal introductions, plant species introductions, anthropic actions**[4]**.However, long-term changes in patterns and processes in forestsystemsmay lead to losses in theirbiologicaldiversity and mayrenderthem more susceptible to invasion **[5]**. Humans have extensivelyaltered the global environment, changing global biogeochemical cycles, transforming land, and enhancing the mobility of biota. Even in national parks and wilderness areas leftuntouched or activelymanaged, populations of plant species can bethreatened, particularly by the spread of invasive alien species, pests and diseases and climate change. Ex situ conservation issometimes the only chance of survival for endangeredspecies. In thiscontext, botanicgardens have a major role to play in conserving and managing a widevariety of plants, not only ex situ, but also in situ in largernatural areas. A botanicalgardenis an area set aside and maintained by an organization for growing and studyingvarious groups of plants for aesthetic, conservation, economic, educational, recreational and scientificpurposes**[6].**

Various programs namely, UNEP (United Nations Environmental Programme), IUBS (International Union of Biological Sciences, UNESCO (United Nations Educational Scientific and Cultural Organization), CITES (Convention on International Trade in EndangeredSpecies) Global BiodiversityStrategywere set off for understanding and evaluatingbiodiversity. Global conservation of biodiversitywillrequire efforts at multiple levels to besuccessful**[7]**. More than 160 countries have ratified the Convention on Biological Diversity (CBD), and are expected to initiateinventory of various components of biodiversity and institutemeasures for in situ conservation and monitoring **[8]**.Floristicinventoryis a necessaryprerequisite for muchfundamentalresearch in tropical communityecology, such as modeling patterns of speciesdiversity or understandingspecies distributions **[9].**Manyfloristicdiversitystudies have been conducted in different parts of world. Majority of studies focus on inventory**[4, 10, 11, 13, 14 and 15].**

In Senegal, more precisely in Sindia, in order to protectbiodiversity, the ngoltongobotanicalgardenwascreated by Haddad C over an area of 50 ha, 25 ha of whichisplanted.

However, the insufficiency or even absence of scientific data on the flora of thisgardenis a major constraintthatlimits the implementation of development and management plans that are essential for the rational use of the NGOLTONGO'sresources.

The generalaim of thisstudyis to contribute to a betterunderstanding of the natural plant resources of the NGOLTONGO botanicalgardenthrough a floristicinventory.

2. MATERIAL AND METHODOLOGY

2.1. Study area

The Ngoltongobotanicalgardenislocated in the rural community (CR) of Sindia, in the department of Mbour in the Thiesregion (Fig.1).It isbordered to the north by the rural community of Diass, to the south by the rural community of Malicounda, to the east by the district of Notto (CR Tassette), Sesséne (Sandiara) and Fissel (Ndiaganiao) and to the west by the Atlantic Ocean.The Sindia CR covered an area of 158 km^2. Todayit has 19 official villages with a population of 28,728 **[16].**Sindia CR has two types of soil: tropical ferruginoussoils (dior, deck, deck diorsoils) and hydromorphicsoils.Sindia CR has two types of soil: tropical ferruginoussoils (dior, deck, deck diorsoils) and hydromorphicsoils.The gardenislocated on a laterite plateau on the slopeleading down to the marble-richsoil.Thecurrent state of the soilsisdeteriorated by the destruction of plant cover, deforestation and over-exploitation. There isalso a demographic push into the cultivated areas, which in turnadvanceinto the wooded and grazing areas. Commercial activity is mainly in the hands of women, especially in the small-scaletrade of fruit, vegetable. Fig.1 shows the localisation of study area.

Fig.1. The localisation of study area.

2.2. Methodology

This study was carried out in the NGOLTONGO Botanical Garden fromNovember 2022 to May 2023.Weproceeded to sample the vegetation by making transects in whichwedelimited stations withinwhichwecarried out floristicsurveys.Given the large size of the studyregion, weopted to choose the most accessible areas, with different plant formations and landscapes.A total of 220sampleswerecollected. As the commonspecieswererecognised in the field, thosethatwewereunable to identifywerecarefullysampled, othersphotographedwhere possible and taken back to

the laboratory for identification. This taskwasfacilitated by the uses of Berhaut flora (1967 ; 1971-1991),HUTCHINSON J. & DAZEIL J.M Flora of west tropical Africa (1954, 1963, 1968), Senegal new flora and neighbouring regions and guides to medicinal plants (The wild fruits of Senegal by Charles HADDAD, 2000).The nomenclatures used are those of LEBRUN & STORK 1991,1992, 1995,1997, and the classification systemsused are those of APGIII of 2009 and APGIV of 2016.

3. RESULTS AND DISCUSSION

3.1. Floristicinventory

The aim of botanical inventories is to describe the floristic composition of each plant formation in order to locate plant formations with a high diversity of species (primaryforest) or containing rare species and to draw up an environmental protection plan.

In the Sahelian zone (Ferlo) of the JBN, wecollected 220 speciesin 161 genera and 57 families.

Table I below shows the list of speciesinventoried in the JBN.

N°	SPECIES NAME	FAMILY	CLASS	BIOLOGICAL TYPE
1.	*Abrus precatorius L.*	FABACEAE	D	liana
2.	*Abutilon avicennae (Gaertener)*	MALVACEAE	D	Herb
3.	*Abutilon pannosum (Forst) Schl.*	MALVACEAE	D	undershrub
4.	*Acacia holosericeaA.Cunn. exG.Don*	FABACEAE	D	Tree
5.	*Acanthospermumhispidum DC.*	ASTARACEAE	D	Herb
6.	*Achyranthesaspera L.*	AMARANTHACEAE	D	Herb
7.	*Adansoniadigitata L.*	MALVACEAE	D	Tree
8.	*Adenium obesum (Forsk.) Roem. & Schult.*	APOCYNACEAE	D	undershrub
9.	*Agave americana L.*	AGAVACEAE	M	Herb
10.	*Agave americana var marginata L.*	AGAVACEAE	M	Herb
11.	*Agave polianthesThiede et Eggli*	ASPARAGACEAE	M	Herb
12.	*Agave sisalana (Perrine)*	AGAVACEAE	M	Herb
13.	*Albizia chevalieri Harms.*	FABACEAE	D	Tree
14.	*Albizia julibrissinDurazz.*	FABACEAE	D	Tree
15.	*Albizia lebbeck (L.) Benth*	FABACEAE	D	Tree
16.	*Albizia saman (jacq.)Merr.*	FABACEAE	D	Tree
17.	*Aleo vera (L.) Burn.f.*	ALOACEAE	M	Herb
18.	*Aloe sp*	ALOACEAE	M	Herb
19.	*AlternantherapungensKunth*	AMARANTHACEAE	D	Herb
20.	*Amaranthusspinosus L.*	AMARANTHACEAE	D	Herb
21.	*Amaranthus viridis L.*	AMARANTHACEAE	D	Herb

N°	SPECIES NAME	FAMILY	CLASS	BIOLOGICAL TYPE
22.	*Ampelocissuspentaphylla (Guill.et Perr.)*	VITACEAE	D	Herb
23.	*Annonamuricata L.*	ANNONACEAE	D	Tree
24.	*Annona senegalensis Pers.*	ANNONACEAE	D	Tree
25.	*Annonasquamosa L.*	ANNONACEAE	D	shrub
26.	*Archontophoenixalexandrae (F.Muell.) H.Wendl et Drude*	ARECACEAE	M	Tree
27.	*Arganiaspinosa (L.) Keels*	SAPOTACEAE	D	Tree
28.	*Arivelaviscosa (L) RAF*	CLEOMACEAE	D	Herb
29.	*Aster alpinus L.*	ASTARACEAE	D	Herb
30.	*Avicennia marina (Forssk.)*	ACANTHACEAE	D	Tree
31.	*Azadirachta indicaA.Juss.*	MELIACEAE	D	Tree
32.	*Balanites egyptiaca (L.) Del*	ZYGOPHYLLACEAE	D	Tree
33.	*Bauhinia rufescensLam.*	FABACEAE	D	Tree
34.	*Bixaorellana L.*	BIXACEAE	D	shrub
35.	*Boerhavia diffusa L.*	NYCTAGINACEAE	D	Herb
36.	*Boerhavia repens L.*	NYCTAGINACEAE	D	Herb
37.	*BosciaangustifoliaA.Rich*	CAPPARACEAE	D	shrub
38.	*BosciasalicifoliaOliv*	CAPPARACEAE	D	shrub
39.	*Boscia senegalensis (Pers.) Lam.exPoir.*	CAPPARACEAE	D	shrub
40.	*BoswellianeglectaS.Moore*	BURSERACEAE	D	shrub
41.	*Bougainvilleaglabra Chois.*	NYCTAGINACEAE	D	shrub
42.	*BougainvilleaspectabilisWilld.*	NYCTAGINACEAE	D	shrub
43.	*CadabafarinosaForsk.*	CAPPARACEAE	D	shrub
44.	*Caesalpinia bonduc (L.)*	FABACEAE	D	Liana
45.	*Caesalpiniaspinosa (Molina) kuntze*	FABACEAE	D	Tree
46.	*Calotropisprocera Ait.*	APOCYNACEAE	D	shrub
47.	*Calystegiasepium (L.) R. Br.*	CONVOVULACEAE	D	Herb
48.	*CapparistomentosaLam.*	CAPPARACEAE	D	Liana
49.	*Cardiospermumhalicacabum L.*	SAPINDACEAE	D	Herb
50.	*Carpenteiraacuminata (Becc.)*	ARECACEAE	M	Tree
51.	*Cascabelathevetia (L.) Lippold*	APOCYNACEAE	D	shrub
52.	*Cassia sieberiana DC.*	FABACEAE	D	Tree
53.	*CeltisintegrifoliaLam.*	CANNABACEAE	D	Tree
54.	*Cereus repandus (L.)Mill*	CACTACEAE	D	Under shrub
55.	*Chrozophora senegalensis (Lam) A.Juss. exSpreng*	EUPHORBIACEAE	D	Herb
56.	*Citrus aurantiifolia (Christm.) Swingle*	RUTACEAE	D	Tree
57.	*Citrus latifolia (Tanaka ex Yu.Tanaka) Tanaka*	RUTACEAE	D	Tree

N°	SPECIES NAME	FAMILY	CLASS	BIOLOGICAL TYPE
58.	*Citrus reticulata Blanco*	RUTACEAE	D	Tree
59.	*Citrus volkmerianaV.Ten et Pasq*	RUTACEAE	D	Tree
60.	*Clotalariaincana L.*	FABACEAE	D	Herb
61.	*Combretumaculeatum Vent.*	COMBRETACEAE	D	shrub
62.	*CombretumglutinosumPerr.ex DC.*	COMBRETACEAE	D	Tree
63.	*Combretummicrantum G. Don.*	COMBRETACEAE	D	Shrub
64.	*Combretumpaniculatum Vent.*	COMBRETACEAE	D	Shrub
65.	*Commelinabenghalensis L.*	COMMELINACEAE	M	Herb
66.	*Commiphora africana 0(A.Rich.) Engl.*	BURSERACEAE	D	Tree
67.	*Commiphoramildbraedii Eng.*	BURSERACEAE	D	Tree
68.	*Commiphoramultijuga (Hiern) K.Schum*	BURSERACEAE	D	Tree
69.	*Conocarpus erectus L.*	COMBRETACEAE	D	Shrub
70.	*Copernicia gigas (Ekman et Burret)*	ARECACEAE	M	Tree
71.	*Corchorusolitorius L.*	MALVACEAE	D	Herb
72.	*Corchorustridens L.*	MALVACEAE	D	Herb
73.	*Cordia senegalensis Juss.*	BORAGINACEAE	D	Tree
74.	*CordiasinensisLam.*	BORAGINACEAE	D	Shrub
75.	*Cordyline fruticosa (L.) A.Chev.*	AGAVACEAE	M	Shrub
76.	*CrataevareligiosaG.Forst.*	CAPPARACEAE	D	Tree
77.	*Cucumismelo var. agretis Naudin*	CUCURBITACEAE	D	Herb
78.	*CymbopogancaesiusChiov.*	POACEAE	M	Herb
79.	*Cyperus rotundus L.*	CYPERACEAE	M	Herb
80.	*Dalbergia melanoxylon Guill.et Pett.*	FABACEAE	D	Tree
81.	*Datura stramonium L.*	SOLONACEAE	D	Herb
82.	*Dichrostachys cinerea (L.) Wight & Arn*	FABACEAE	D	Shrub
83.	*Dictyosperma album (Bory) Scheff.*	ARECACEAE	M	Tree
84.	*Digitariasanguinalis (L.) Scop*	POACEAE	M	Herb
85.	*DiospyrosmespiliformisHochst.ex A. Rich.*	EBENACEAE	D	Tree
86.	*Dypsisdecaryi (Jum.) Beentjie et J.Dransf*	ARECACEAE	M	Tree
87.	*Dypsismadagascariensis (Becc.)*	ARECACEAE	M	Tree
88.	*Eichhorniacrassipes (Mart) Solms*	PONTEDERIACEAE	M	Herb
89.	*Eleusine indicaGaertn.*	POACEAE	M	Herb
90.	*Emilia sonchifolia (L.) DC*	ASTARACEAE	D	Herb
91.	*Eragrostispilosa (L.) P.Beauv.*	POACEAE	M	Herb
92.	*Eragrostistenella (Linn.) Roem.et Schult.*	POACEAE	M	Herb
93.	*Eriochloavilosa (Thunb.) Kunth*	POACEAE	M	Herb
94.	*ErythrinaperuvianaKrukoff.*	FABACEAE	D	Shrub

N°	SPECIES NAME	FAMILY	CLASS	BIOLOGICAL TYPE
95.	*ErythrophleumfordiiOliv.*	FABACEAE	D	Tree
96.	*EucaluptuscamaldulensisDehnh*	MYRTACEAE	D	Tree
97.	*Euonymusjaponicus L.*	CELASTRACEAE	D	Shrub
98.	*Euphorbia glomerifera (Millsp.) L.C. Wheeler*	EUPHORBIACEAE	D	Herb
99.	*Euphorbiaheterophylla L.*	EUPHORBIACEAE	D	Herb
100.	*Euphorbiahirta L.*	EUPHORBIACEAE	D	Herb
101.	*EuphorbialacteaHaw.*	EUPHORBIACEAE	D	Shrub
102.	*Euphorbiamilii Des Moul.*	EUPHORBIACEAE	D	Shrub
103.	*Euphorbiamilii var. splendeur (Bojer ex Hook.) Ursch & Leandri*	EUPHORBIACEAE	D	Shrub
104.	*EuphorbiasudanicaA.Chev.*	EUPHORBIACEAE	D	Shrub
105.	*Evolvolusalsinoides (L.) L.*	CONVOVULACEAE	D	Herb
106.	*Faidherbia albida Del. A. Chev.*	FABACEAE	D	Tree
107.	*Feretiaapodanthera Del.*	RUBIACEAE	D	Shrub
108.	*Ficus benjamina L.*	MORACEAE	D	Tree
109.	*Ficus iteophyllaMiq.*	MORACEAE	D	Tree
110.	*Ficus luteaVahl*	MORACEAE	D	Tree
111.	*Ficus platyfylla Del.*	MORACEAE	D	Tree
112.	*Ficus racemosa L.*	MORACEAE	D	Tree
113.	*Flueggeavirosa (Roxb. & Willd.)Baill.*	PHYLLANTHACEAE	D	Shrub
114.	*Grewiabicolor Juss.*	MALVACEAE	D	Shrub
115.	*Guiera senegalensis j.f.gmel.*	COMBRETACEAE	D	Shrub
116.	*Hibuscuscannabinus L.*	MALVACEAE	D	Herb
117.	*Hippocrateaafricana (Willd.) Loes*	CELASTRACEAE	D	Liana
118.	*Hylocereusundatus (Haw.) Britton et Rose*	CACTACEAE	D	Tree
119.	*Hyophorbe lagenicaulis (L.H.Bailey) H.E.Moore.*	ARECACEAE	M	Shrub
120.	*Hyparrheniahirta (L.) Stapf*	POACEAE	M	Herb
121.	*Hyphaenethebaica (L.) Mart.*	ARECACEAE	M	Tree
122.	*HyptissuaveolensPoit.*	LAMIACEAE	D	Herb
123.	*Indigoferaastragalina DC.*	FABACEAE	D	Shrub
124.	*Indigoferatinctoria L.*	FABACEAE	D	Shrub
125.	*Ipomoeaasarifolia (Desr.) Roem et Schult.*	CONVOVULACEAE	D	Herb
126.	*Ipomoeabatatas L.*	CONVOVULACEAE	D	Herb
127.	*Ipomoeapes-tigridis L.*	CONVOVULACEAE	D	Herb
128.	*Ixora coccinea L.*	RUBIACEAE	D	Shrub
129.	*Jatropha gossypiifolia L.*	EUPHORBIACEAE	D	Herb
130.	*Khaya senegalensis (Desr) A.Juss.*	MELIACEAE	D	Tree

N°	SPECIES NAME	FAMILY	CLASS	BIOLOGICAL TYPE
131.	*Lactuca taraxacifolia (Wild.) Sc et Th.*	ASTARACEAE	D	Herb
132.	*Lactuca virosa L.*	ARECACEAE	D	Herb
133.	*Lanneaacida A. Rich.*	ANACARDIACEAE	D	Tree
134.	*Lantana camara L.*	VERBENACEAE	D	Shrub
135.	*Leptadenialancifolia (schumach. &thonn.)*	APOCYNACEAE	D	Herb
136.	*Leptadeniahastata (Pers.) Decne.*	APOCYNACEAE	D	Herb
137.	*Leucaenaleucocephala (Lam.) Wit.*	FABACEAE	D	Tree
138.	*Luffa aegyptiaca (Mill.)*	CUCURBITACEAE	D	Herb
139.	*Malpighiaglabra L.*	MALPIGHIACEAE	D	Tree
140.	*Mangiferaindica L.*	ANACARDIACEAE	D	Tree
141.	*Maytenus senegalensis (Lam.) Exell.*	CELASTRACEAE	D	Shrub
142.	*Melaleucaleucadandron (L.) L.*	MYRTACEAE	D	Tree
143.	*Mitracarpus scaber (Zucc.)*	RUBIACEAE	D	Herb
144.	*Momordicabalsamina L.*	CUCURBITACEAE	D	Herb
145.	*Momordicacharantia L.*	CUCURBITACEAE	D	Herb
146.	*Moringa oleiferaLam.*	MORINGACEAE	D	Tree
147.	*Morus mesozygiaStapf.*	MORACEAE	D	Tree
148.	*Musa paradisiaca L.*	MUSACEAE	M	Herb
149.	*Neriumoleander L.*	APOCYNACEAE	D	Shrub
150.	*Ocimum basilicum L.*	LAMIACEAE	D	Herb
151.	*Opuntia engelmanni var linguiformisGriff.*	CACTACEAE	D	Under shrub
152.	*Opuntia tuna (L.)Mill.*	CACTACEAE	D	Under shrub
153.	*Passiflorafoetida L.*	PASSIFLORACEAE	D	Liana
154.	*Pennisetum violaceum (Lam.)*	POACEAE	M	Herb
155.	*Pergulariadaemia (Forssk.) Chiov.*	APOCYNACEAE	D	Herb
156.	*Peristrophebicalyculata (Retz) Nees*	ACANTHACEAE	D	Herb
157.	*Petrea volubilis L.*	VERBENACEAE	D	Liana
158.	*Phœnix dactyliferia L.*	ARECACEAE	M	Tree
159.	*Phragmites australis (Cav.) Trin. Ex Steud*	POACEAE	M	Herb
160.	*Phyllantusniruri L.*	PHYLLANTHACEAE	D	Herb
161.	*Piliostigmareticulatum (DC) Hochst.*	FABACEAE	D	Shrub
162.	*Pistiastratiotes L.*	ARECACEAE	M	Herb
163.	*Plectranthusamboinicus (Lour.) Spreng.*	LAMIACEAE	D	Herb
164.	*Polyalthialongifolia (Sonn.) Twaites*	ANNONACEAE	D	Tree
165.	*Portulacaoleracea L.*	PORTULACACEAE	D	Herb
166.	*Prosopis chilensis (Mol.) Stunz*	FABACEAE	D	Tree

N°	SPECIES NAME	FAMILY	CLASS	BIOLOGICAL TYPE
167.	*Psidiumguajava L.*	MYRTACEAE	D	Tree
168.	*Ptychospermamacarthurii (H.Wendl ex H.J.Veitch)*	ARECACEAE	M	Tree
169.	*Ptychospermamicrocarpum Burret*	ARECACEAE	M	Tree
170.	*Pulmeriapudica Jacq.*	APOCYNACEAE	D	Tree
171.	*Punicagranatum L.*	LYTHRACEAE	D	Tree
172.	*Raphia sudanicaA.Chev.*	ARECACEAE	M	Tree
173.	*Rhapis excelsa (Thunb.) A.Henry*	ARECACEAE	M	Herb
174.	*Rhizophora racemosaG.Mey.*	RHIZOPHORACEAE	D	Shrub
175.	*Rhynchosia minima (L.) DC.*	FABACEAE	D	Liana
176.	*Ruellia simplex C.*	ACANTHACEAE	D	Herb
177.	*Sabal minor Pers.*	ARECACEAE	M	Shrub
178.	*Sabal palmetto (Walter) Lodd. exSchult et Schult.f.*	ARECACEAE	M	Tree
179.	*Sarcocephaluslatifolius (Sm.) E.A.Bruce*	RUBIACEAE	D	Shrub
180.	*Sclerocaryabirrea (A. Rich) Hochst.*	ANACARDIACEAE	D	Tree
181.	*Scopariadulcis L.*	PLANTAGINACEAE	D	Herb
182.	*SecuridacalongipedunculataFres.*	POLYGALACEAE	D	Tree
183.	*Senegaliaataxacantha DC.*	FABACEAE	D	Tree
184.	*Senegaliamellifera (Vahl) L.A.Silva & J.Freitas*	FABACEAE	D	Tree
185.	*Senegaliasenegal (L.) Britton*	FABACEAE	D	Tree
186.	*Senna occidentalis L.*	FABACEAE	D	Shrub
187.	*Senna tora L.*	FABACEAE	D	Under shrub
188.	*Sesbania rostrataBremek et Oberm*	FABACEAE	D	Shrub
189.	*Sida rhombifolia L.*	MALVACEAE	D	Shrub
190.	*Solanum seaforthianum Andrews*	SOLONACEAE	D	Liana
191.	*Speudophoenixekmanii Burret*	ARECACEAE	M	Tree
192.	*Spondias dulcis Sol. Ex Parkinson*	ANACARDIACEAE	D	Tree
193.	*Spondias mombin L.*	ANACARDIACEAE	D	Tree
194.	*Stevia rebaudiana (Bertoni)*	ASTARACEAE	D	Shrub
195.	*Strophantus sarmentosus DC.*	APOCYNACEAE	D	Shrub
196.	*Syagrusromanzoffiana (Cham.) Glassman*	ARECACEAE	M	Tree
197.	*Talinumpaniculatum (Jacq.) Gaertn.*	TALINACEAE	D	Herb
198.	*Tamarindusindica L.*	FABACEAE	D	Tree
199.	*Tamarix senegalensis DC.*	TAMARICACEAE	D	Shrub
200.	*Tapinanthusbangwensis (Engl et Krause)*	LORANTHACEAE	D	Shrub
201.	*Tetrapleuratetraptera (schumach.et Thom)*	FABACEAE	D	Tree
202.	*Trema guineensis (schumach.et Thom)*	CANNABACEAE	D	Tree

203.	*Tridaxprocumbens L.*	ASTARACEAE	D	Herb
N°	**SPECIES NAME**	**FAMILY**	**CLASS**	**BIOLOGICAL TYPE**
204.	*Turnera diffusa Willd. exSchult.*	PASSIFLORACEAE	D	Shrub
205.	*Typha domingensis Pers.*	TYPHACEAE	M	Herb
206.	*Vachellia nilotica var adansonii (L.)*	FABACEAE	D	Tree
207.	*Vachellia nilotica var tomentosa (L.)*	FABACEAE	D	Tree
208.	*Vachellia sebieriana (DC.) Kyal. &Boatwr.*	FABACEAE	D	Tree
209.	*Vachellia seyal (Delile) P.J.H.Hurter*	FABACEAE	D	Tree
210.	*Vachelliatortilis (Forssk.) Hayne*	FABACEAE	D	Tree
211.	*Vernonia adoensisvarkotschyanaSch.Bip.*	ASTARACEAE	D	Herb
212.	*Waltheraindica L.*	MALVACEAE	D	Herb
213.	*WodyetiabifurcataA.K.Irvine.*	ARECACEAE	M	Tree
214.	*Yucca aloifolia L.*	ASPARAGACEAE	M	Tree
215.	*Yucca gigantea Lem.*	ASPARAGACEAE	M	Shrub
216.	*Yucca gloriosa L.*	ASPARAGACEAE	M	Shrub
217.	*Ziziphus jujuba Mill.*	RHAMNACEAE	D	Shrub
218.	*Ziziphus mauritianaLam.*	RHAMNACEAE	D	Tree
219.	*Ziziphus mucronataWilld.*	RHAMNACEAE	D	Tree
220.	*Ziziphus spina-christi (L.)*	RHAMNACEAE	D	Shrub

The systematicspectrum of the different taxa sampled in the studyregion shows the predominance of Fabaceae (35 species, i.e. 61.40%), Arecaceae (19 species, i.e 33.33%) , Apocynaceae, Euphorbiaceae, Malvaceae , Poaceae (9 species, i.e 15.79%), Asteraceae (8 species, i.e 14.04%) and Capparaceae ,Combretaceae ,Moraceae (6 species, i.e 10.54%)(Table I).The otherfamilies are representedwith a number of speciesrangingfrom 1 to 5 (Fig. 2).The total number of species in the gardenis 220species, with 167 genera and 57 families.Analysis of this flora also shows that the Fabaceaefamilyis the mostrepresented in the environment. This strongpresence of Fabaceaecouldbeexplained by theirability to fix atmosphericnitrogen and their high seed production, which can remain viable for a very long time in the soil.

In the sameregion, Ndiaye (2012) recorded more than 324 speciesin 243 genera and 81 families, and noted a simple regression, probably due to humanactivities and land predation**[17].** However, ourresults are superior to those of the flora of the Michel Adanson botanicalconservatory in Mbour, which comprises 184 speciesin 146 genera and 54 families.

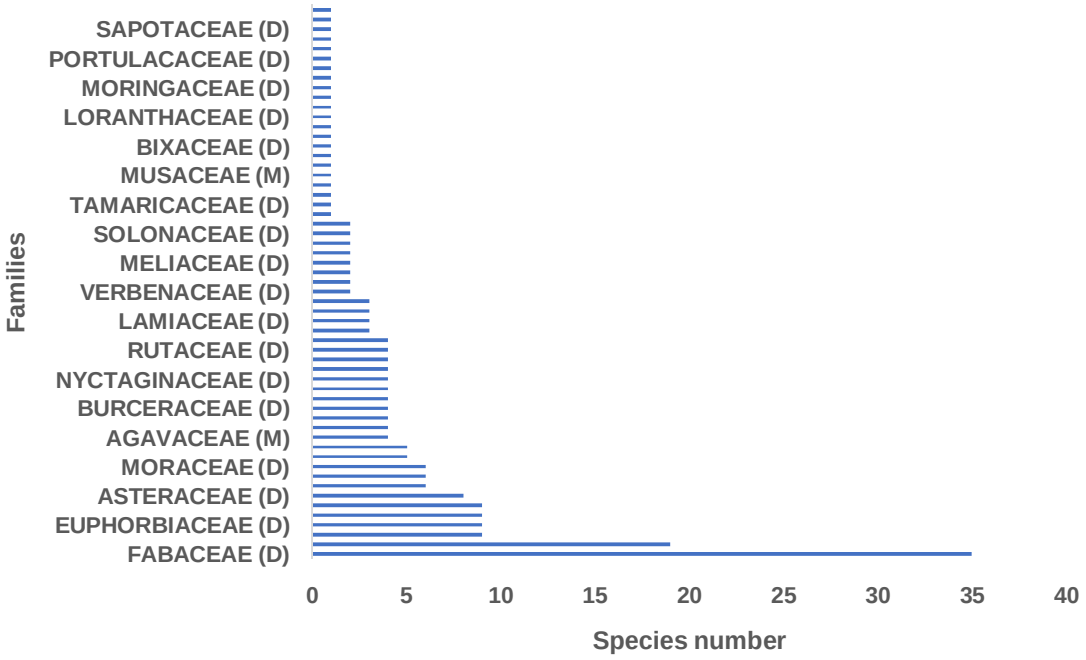

Fig.2. Systematic spectrum of the various taxa sampled.

In the garden, certain species are poorlyrepresented or evenveryseldom;thisis the case of the commelinaceae, cyperaceae and musaceae (Fig. 2). Great care must thereforebetakenwiththesemonospecificfamilies, because if the correspondingspeciesdisappears, the familydisappearsfrom the flora.This distribution of familiesisgreaterthan that of the JEPU flora **[18],**wherelegumesdominatewith 14.87%, followed by Euphorbiaceae (8.43%) in 8 genera.

3.2. DISTRIBUTION OF SPECIES BY CLASS

Familiesbelonging to the dicotyledonous class accounted for 82.46%, with the remaining 17.54% belonging to the monocotyledonous class (Table II). In terms of genera, the dicotyledonous class represented 79.50%. In terms of diversity at the specificlevel, dicotyledonsrepresent 80.45%. The results of the floristic inventories of the botanicalgarden of the Faculty of Science and Technology (FST, UCAD) showedthat the gardenisrichin 245 speciesdividedinto 190 genera and 71 families. Dicotyledonsaccount for the majority of species (82.4%), genera (81.6%) and families (78.9%). These results are in accordance withourinventory**[19].**

This analysis shows that the Sahelian zone of the JBN has a high level of specificdiversity. This remarkablediversitywithinfamiliesis due not only to the factthat the gardeniswellmaintained, but also to the fact that there has been a strong drive to introducespeciessince 2003. What's more, the species come from almost all over the world, as in the case of the *ArganiaSpinosa*from Morocco.The strongpresence of specieswith a widegeographical distribution shows the importance of the Botanical Gardens in theirability to restore ecosystemsdegraded by theirresearchactivitiesprior to introduction **[20].** Table II shows distribution of species by class.

Table II. Distribution of species by class

Class	Families		Genera		Species	
	Number	%	Number	%	Number	%
Dicotyledons	47	82,46	128	79,50	177	80,45
Monocotyledons	10	17,54	33	20,50	43	19,55

The Fig.3 shows distribution of species by class

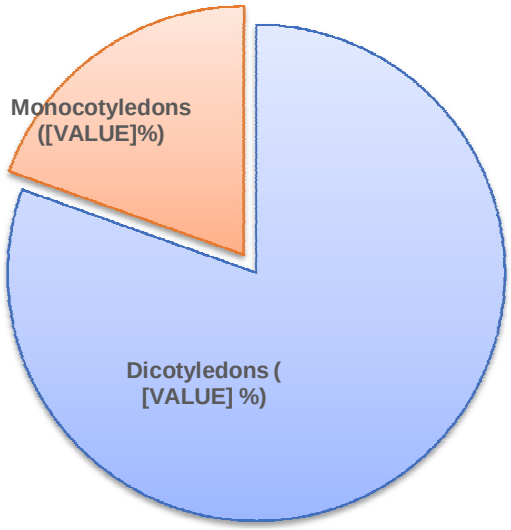

Fig. 3. Distribution of species by class

4. CONCLUSION

Floristicdiversitywasassessed at the Ngoltongobotanicalgarden in order to understand the current state and develop effective management strategies for the conservation of plant species. Various sampling techniques and measurementmethods are useddepending on the objectives of the studies, and in the majority of studies, the size of the garden, money and manpower are the main constraints.

The inventory of the NgoltongoBotanicalgarden shows a relatively diverse flora with 220speciesin 161genera and 57families.The NgoltongoBotanical Garden appears to be a site of high biodiversity due to the diversity of speciesplanted in a relatively large area. It is therefore important for the success of its conservation, education and scientificresearch missions to consider :setting up a register to monitor speciesfromtheir introduction to theirdisappearance, drawing up a seminum index , ethnobotanical studies of the site to find out whichspecies are threatened in the area and considertransplantingthem for ex-situ conservation, the phyto-sociological and phenologicalstudy of the site, the construction of a seedbed to enable exchanges withotherbotanicgardens.

5. DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) herebydeclarethat NO generative AI technologies such as Large LanguageModels (ChatGPT, COPILOT, etc) and text-to-image generators have been usedduringwriting or editing of thismanuscript.

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