
ORNAMENTAL PTERIDOFLORA FROM DAKAR (SENEGAL)

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ABSTRACT

In Senegal, few scientific investigations have been done on ornamental pteridophytes, while the specific diversity of ornamental flora is becoming increasingly important due to the enhancement of several species belonging to different taxonomic levels. It is therefore important today to take an interest in this taxonomic group to contribute to a better knowledge of the ornamental flora of Senegal. More specifically, this work this present work aims to determine the taxonomic spectrum, the specific richness by family and the chorological spectrum of pteridoflore. Methodology and results: This study was carried out in 84 horticultural stations in the city of Dakar. In each site, a traveling inventory was carried out. Subsequently, the structure of the flora was analyzed. The results made it possible to identify 11 ornamental ferns, belonging to 5 genera united in 3 families. Among these species, none has been mentioned in the flora of Senegal. The Dryopteridaceae family is predominant with 72.72% of the species recorded. In addition, the genus *Nephrolepis* is the most diverse with 63.64% of the flora. In addition, this flora is dominated by pantropical species which represents 45.45% of the flora or 5 species in total.

Keywords: Pteridoflora, Ornamental, Ferns, Dakar, Senegal.

1. INTRODUCTION

Senegal has significant specific richness with more than 3,500 plant species (Ba and Noba., 2001; MEPN, 2010). In this kingdom, Angiosperms (flowering plants) are best known. However, few scientific investigations have been made on lower plants, in particular the ornamental pteridophytes, while the expansion of floriculture in Dakar increases the number of taxa and mobilizes an important plant diversity consisting of both local species, that have been introduced for a very long time or recently (Dieng, 2014).

In addition, the cryptogamic flora presents a very important stake and interest for the country, both environmentally and economically. It is therefore important today to take an interest in this taxonomic group to contribute to a better knowledge of the ornamental Pteridological flora of Senegal. More specifically, this present work aims to determine the taxonomic spectrum, the specific wealth per family and the chorological spectrum.

2. MATERIAL AND METHODS

2.1. The study area

The studies were carried out in Dakar (14 ° 41'37 " North latitude and 17 ° 26'38 " West longitude) from 2016 to 2018. In total, 84 nurseries were visited, distributed in different municipalities (Fig. 1).

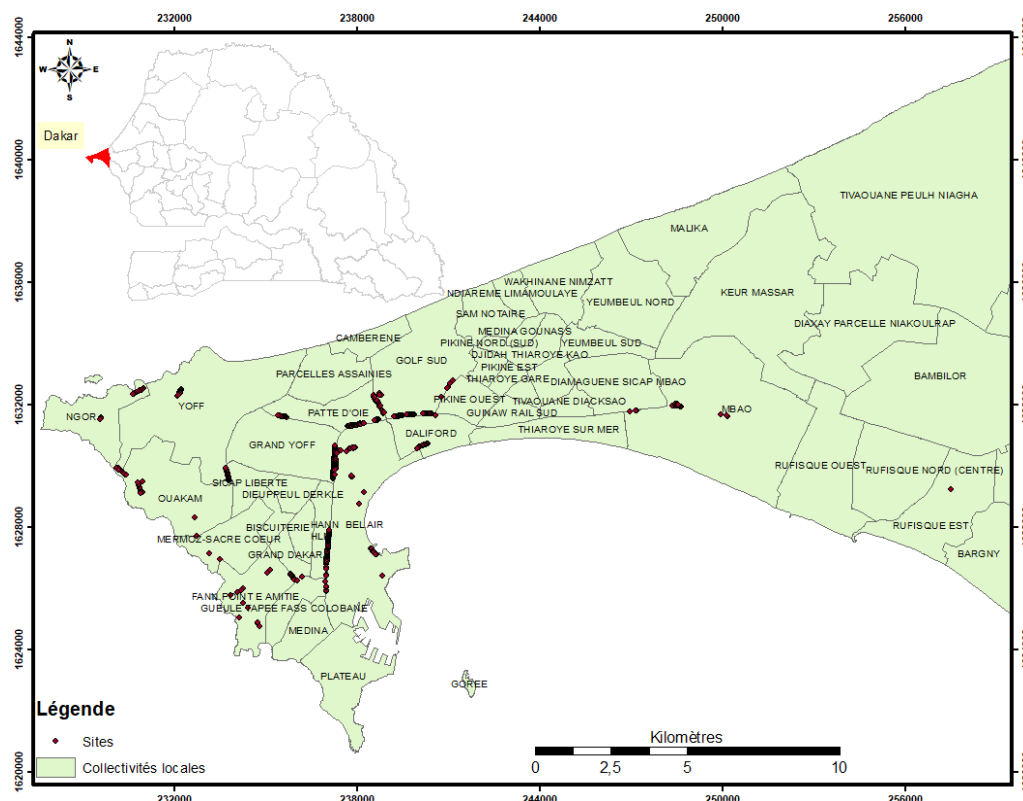


Figure 1. Location of nurseries according to municipality

2.2. Inventory and identification of taxa

The inventory was carried out in 84 stations by adapting the itinerant method, that is to say going around the plot and listing all the species that are cultivated there. For each of these plants, its botanical characters have been described on the spot and its vernacular name has been reported. Once in the laboratory, the botanical characters of each plant were compared to those described in the available documentation. After identifying each species, a corresponding scientific name was assigned to it and the description of its botanical characters completed. In addition, the species determination was carried out using:

Flora (Hutchinson & Dalziel, 1954, 1963, 1972 ; Hutchinson & *al.*, 1958 ; Friedmann, 2011; LEjoly & *al.*, 2010).

The results of the work of the Botany and Biodiversity laboratory (BA & Noba, 2001);

Other textbooks such as: (Graf, 1963 ; Bärtels, 1994 ; Arbonnier, 2002 ; Quintana, 2013).

Samples of herbaria from the Department of Plant Biology of the Faculty of Sciences and Techniques of the University Cheikh Anta DIOP in Dakar.

The nomenclature used follows the database managed at the Conservatoire et Jardin Botanique (CJB) in Geneva; this database is based on the important work of Lebrun and Stork (1991-1997) and is accessible on the following regularly updated site:

<http://www.ville-ge.ch/musinfo/bd/cjb/africa/index.php?langue=fr>

The classification used is that of APG III (2009).

2.3. Analysis of the structure of the Pteridological flora

To analyze the Pteridological flora, the taxonomic spectrum, the specific richness by family and the Chorological Spectrum were determined.

➤ The taxonomic spectrum

For each species listed and identified, its scientific name (genus name + specific epithet) and its family have been attributed to it. Thus, the total number of species, genera and families of ornamental flora could be studied.

➤ The distribution of species by family

The distribution was made according to the formula below :

$$\text{Proportion (\%)} = \frac{\text{Number of species per family}}{\text{Total number of species}} *100$$

➤ The chorological spectrum

For the development of the chorological spectrum, the species were classified according to their geographical origin. To do this, the information mainly comes from the flora of Hutchinson and Dalziel (1972), the illustrated flora of Berhaut (1971-1991). There are African Species (Af), Afro-American Species (Am), Afro-Asian Species (As), Afro-Malagasy Species (Ma), Afro-Malagasy and Asian Species (Mas), African and Mediterranean (Af-Me), African tropical species (AfT), and Pantropical species (Pt).

For the evaluation and interpretation of the results, the percentage proportion of each biogeographic affinity is calculated by the following formula:

$$\text{Proportion (\%)} = \frac{\text{Number of species of each biogeographic affinity}}{\text{Total number of species}} *100$$

3. RESULTS AND DISCUSSION

➤ Taxonomic spectrum

Table 1 gathers the list of ornamental ferns from Dakar. For each species, its presence or not in the flora of Senegal, its biological type and its geographical distribution were mentioned.

This work made it possible to identify in Dakar 11 species of ornamental ferns, belonging to 5 genera and 3 families (Tab1). Among these ferns, none has been recorded in the flora of Senegal.

Table 1. List of ornamental ferns identified with indications on their presence or not in the flora of Senegal (Berhaut, 1967), their biological type (T.B), their geographical distribution (R.G) and their decorative aspect (A.D)

Family	N G	N E	Species	F. S	T B	RG	A. D
Dryopteridaceae (Pt)	2	8	<i>Dryopteris aemula</i> (Aiton) Kuntze.	-	G	Af- Me	Fe
			<i>Nephrolepis biserrata</i> (Sw.) Schott	-	G	Pt	Fe
			<i>Nephrolepis cordifolia</i> (L.) C. Presl	-	G	Pt	Fe
			<i>Nephrolepis duffii</i> T. Moore	-	G	Mas	Fe
			<i>Nephrolepis exaltata</i> (L.) Schott. 'hillii'	-	G	Pt	Fe
			<i>Nephrolepis exaltata</i> (L.) Schott 'Rooseveltii'	-	G	Pt	Fe
			<i>Nephrolepis falcate</i> (Cav.) C. Chr.	-	G	As	Fe
			<i>Nephrolepis undulata</i> (afzel. Ex Sw) J. Sm.	-	G	Af	Fe
Marsilaceae (Pt)	1	1	<i>Marsilea quadrifolia</i> L.	-	Hy	Cosm	Fe
Polypodiaceae (Pt)	2	2	<i>Microsorium punctatum</i> (L.) Copel.	-	G	Pt	Fe
			<i>Polypodium scolopendria</i> Burm. f.	-	G	Am	Fe
Total	5		11				

➤ Specific wealth by family

Table 2 represents the specific richness by family of ornamental ferns recorded in Dakar.

This flora is dominated by the Dryopteridaceae family which brings together 72.72% of the fern species recorded, i.e. 8 species in total, followed by Polypodiaceae and Marsiliaceae with 18.18% (2 species) and 9.10% (1 species respectively (Tab. 2).

Table 2. Specific wealth by family of species

Family	Number of species	Proportion (%)
Dryopteridaceae (Pt)	8	72,72
Polypodiaceae (Pt)	2	18,18
Marsilaceae (Pt)	1	9,10
Total	11	100,00

➤ **Distribution of species by genus**

The distribution of species by genus is shown in Table 3.

The most diverse genus is the *Nephrolepis* genus, which includes 63.64% of the species listed, or 7 species in total (Tab. 3). On the other hand, the genera with one (1) species group together in total 36.36% of the species.

Table 3. Distribution of species by genus

N°	Genus	Number of species	Proportion (%)
1	<i>Nephrolepis</i>	7	63,64
2	<i>Dryopteris</i>	1	9,10
3	<i>Marsilea</i>	1	9,10
4	<i>Microsorium</i>	1	9,10
5	<i>Polypodium</i>	1	9,10
Total species		11	100,00

➤ **Chorological spectrum**

The representation of species according to their biogeographic affinities is grouped together in Table 4.

Our analysis shows that this flora is dominated by pantropical species which represents 45.45% of the flora, ie 5 species. The six (6) other biogeographical affinities together group together 54.55% of the flora (Tab. 4).

Table 4. Distribution of species according to their biogeographic affinity

Biogeographic affinity	Number of species	Proportion (%)
Pantropical species (Pt)	5	45,45
African species (Af)	1	9,09
Afro-Asiatic species (As)	1	9,09
Cosmopolitan species (Cosm)	1	9,09
Afro-Malagasy and Asiatic species (Mas)	1	9,09
African and Mediterranean species (Af-Me)	1	9,09
Afro-American species (Am)	1	9,09
TOTAL	11	100,00

4. DISCUSSION

This work made it possible to identify in Dakar 11 ornamental ferns, belonging to 5 genera and united in 3 families. Compared to the Togolese ornamental flora, Radji & al., (2010) identified 20 species of ferns belonging to 6 genera and united in 4 families. This difference in the number of species could be explained by the fact that in the context of this work, only 84 nurseries were visited in Dakar, while in Togo Radji & al., (2010) made an exhaustive inventory in all the nurseries in Togolese towns. However, these results are similar to the work of Péne (2018) who identified 11 species belonging to 5 genera united in 3 families. This could be explained by the fact that the two studies were carried out in the same city. On the other hand, Baldé (2017) identified in the Kédougou zone 14 species divided into 8 genera and 6 families. Among the species identified by Baldé (2017), 9 are cited in the flora of Berhaut, unlike this present work where no species has been cited in the flora of Senegal. This could be explained by the fact that this study focuses on floriculture, which is one of the main vectors for the introduction of exotic plants throughout the world. This flora is dominated by the Dryopteridaceae family which includes 72.72% of the species listed. Unlike the Togolese ornamental flora where the Polypodiaceae family was predominant with 35% (Radji & al., 2010). Similarly, these results do not corroborate those of Baldé (2017) and Péne (2018) who showed that the dominant families are respectively those of the Pteridaceae (35.71%) and Davaliaceae (63.63%). The most diverse genus is the genus *Nephrolepis* which includes 63.64% of the listed species. This corroborates the work of Radji & al., (2010) who also showed that the genus *Nephrolepis* was more diverse with a rate of 25%. Among the species of this genus, we have *Nephrolepis biserrata* which is valued as a medicinal plant in Ivory Coast (Adou & al., 2014). Indeed, *Nephrolepis biserrata* is used as a medicinal plant in various forms of medicinal preparations in the fight against various pathologies such as: whitlow, wounds, boils, extracting thorns, fontanel, malaria, sickly and nonchalant baby and the reduction of large navels in children (Adou & al., 2014). *Nephrolepis exaltata*, on the other hand, is considered to be an ornamental houseplant capable of absorbing formaldehyde and xylene (Langis and Kerry, 2012). The results also showed that this flora is dominated by pantropical species which represents 45.45% of the flora. This dominance of these pantropical species could be explained by the continental position and probably by the adaptation of these species to the bioclimatic conditions of the area (Noba & al., 2004).

5. CONCLUSION

This study, the aim of which is to contribute to a better knowledge of the ornamental Pteridological flora of Senegal, made it possible to identify 11 ornamental ferns, belonging to 5 genera united in 3 families. Among these species, none has been mentioned in the flora of Senegal.

The Dryopteridaceae family is predominant with 72.72% of the species recorded. The genus *Nephrolepis* is the most diverse with 63.64%. In addition, this flora is dominated by pantropical species which represents 45.45% of the flora or 5 species in total.

RECOMMENDATION

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