



Phytoecological study of dry vegetation in Mohéli island, the only biosphere reserve of Comoros Archipelago

Maoulida Mohamed ABDILLAHI ¹ and ² and Frédéric BIORET ²

1. INRAPE, National Institute of Research in Agriculture Fisheries and Environment, Moroni, Comoros
2. EA 7462 Geoarchitecture Territories, Urbanization, Biodiversity, Environment, UFR Sciences and Techniques, University of Western Brittany, France

INTRODUCTION

The dry vegetation of Mohéli island, the only biosphere reserve of Comoros archipelago, is very rich in biological diversity. However, it is the most threatened and the least known. In Mohéli, the area of natural forest is estimated at 1070 ha. The dry forest is located on the slopes and ridges at the edge of the Crater Lake Dzani Bunduni and on the small hill next to the village of Itsamia. As on many islands of the Indian Ocean, in the Comoros, the lowland dry forest has almost disappeared and is replaced by farmland or urban areas, radically secondarized and forming an impoverished thicket, often open and dominated by savannas. Remnants of poorly disturbed dry forests are reduced to small areas of a few hectares regularly grazed by livestock (Keith et al., 2006) and that dry forests are used for extensive grazing, they are still structured and rich in indigenous and endemic species. It is urgent to identify these remnants of dry forests and thickets, because these types of vegetation are the most threatened.

The present study aims at providing ecological information on the dry vegetation formations of the Mohéli Island and propose solutions for their conservation.

These knowledge should facilitate the definition of ways of managing and conserving the natural and semi-natural habitats of dryland species, especially forests in a context of insularity but also to demographic and urban expansion dynamics.

Our approach is based on the survey of the floristic and structural description, and the determination of threats and pressures on the types of dry vegetation formations existing on Mohéli.

METHOD

Two approaches were adopted for data collection :

1-Braun-Blanquet's method : the vegetation plot, according to the Braun-Blanquet method, used to highlight the floristic diversity and the biological spectrum, according to Dalage & Metaillie (2000) and based on the homogeneity criteria of Gounot (1969) ;

2-Rothe's method of regeneration: the overall natural regeneration was determined according to the formula of Rothe (1964) and the structures of Rollet (1983).

RESULTS

1-Physiognomic characteristics : All these forests are well stratified and the trees do not exceed 15 m in height and are deciduous. The density varies from 450 to 781 individuals per hectare. For example, the Bunduni dry forest (Map 1, Fig. 1) presented 3 strata (Fig. 2), with some emergents with *Adansonia digitata* at a height of up to 20m.

2-Floristic characters : Eighty (80) species, belonging to sixty-six (66) genera and forty (40) families were identified in the all formations, including 62 trees and shrubs. In the floristic composition of the Bunduni Dry Forest shows fifty-nine (59) species in 54 genera and 35 families (Table 1). The most represented families are RUBIACEAE, EUPHORBIACEAE and FABACEAE The density is 781 plants per hectare. Mesophanerophytes (37%), Microphanerophytes (20%) and Nanophanerophytes (15%).

3-Global natural regeneration: Natural regeneration is high for all the plant formations studied without the Bunduni dry forest (53.96%) and the distribution of individuals by class of diameter shows a bell curve (Fig. 3), indicating a regeneration difficulty.

4-Pressures and threats on vegetation formations
 The threats affecting forests in Mohéli fall into two categories : anthropogenic threats (Agriculture, Overexploitation of forest wood for several uses, Invasive species) and natural threats (cyclones).

CONCLUSIONS

The study included Five dry plant formations of Moheli island. The physiognomy are well organized with true layering and deciduous leaves. The biogeography of the flora shows that 25 % of the species are endemic to the Comoros. Natural regeneration is high for all the plant formations studied but it is low for the Bunduni dry forest. Mesophanerophytes, nanophanerophytes and lianas are the predominant biological types. The most common biological traits are foliar deciduousness, pachycaulia and aphyllia. In these plant formations, 96 species are distributed in 40 families, the most abundant of which are FABACEAE, RUBIACEAE and EUPHORBIACEAE. Many of these species are widely used by the local population. The formations are subject to various pressures and threats of two types : anthropic and natural. This article therefore aims at providing objective elements that can support conservation actions.

REFERENCES

- Dalage, A. & Metaillie, G. *Dictionnaire de biogéographie*. Centre Nationale pour la Recherche Scientifique. Paris. **2000**. 579p.
 Gounot, M. *Méthode d'étude quantitative de la végétation*. Masson. 1 ère édition. Paris. **1969**. 224p.
 Keith, P., Abdou, A., & Labat, J.N. *Inventaire faunistique des rivières des Comores et inventaire botanique*. Muséum d'Histoire Naturelle de Pris. Paris. **2006**. 105p.
 Rollet, B., **1983**. La régénération naturelle dans les trouées : Un processus général de la dynamique des forêts tropicales humides. *Bois et forêts des tropiques*, 298p.
 Rothe, P. L.. Régénération naturelle en forêt tropicale, sur le versant cambodgien du golf de Siam. *Bois et forêts des tropiques*, **1964**. 24 : 386-397.

ACKNOWLEDGEMENTS

We would like to thank the SEP 381 project for their financial support. Thank you also to all the people who supported us for the realization of this field study as well as the writing of this article, in particular the SCAC service of the French Embassy in Moroni.

CONTACT INFORMATION

abdillahimaoulida@yahoo.fr/amaoulidaabdillahieco1887@yahoo.com

Tel : +269 335 11 62

Map 2 : Current vegetation of both sites: Bunduni dry forest and dry forest Rocher Hamada Ali (Mohéli)

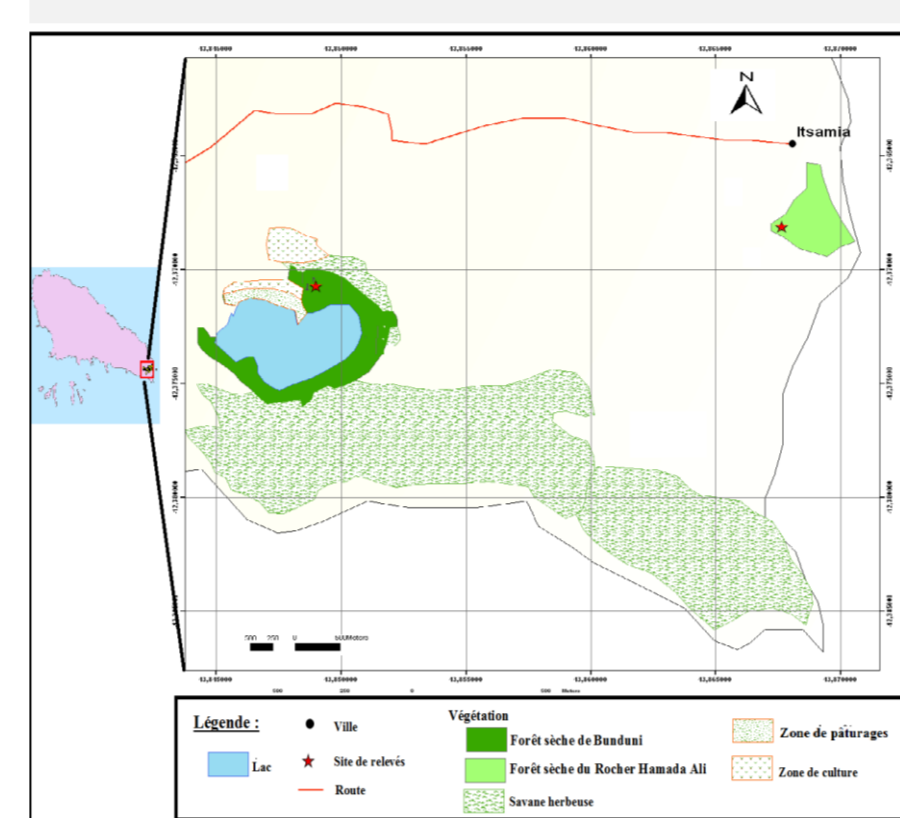


Fig.1 : The Bunduni Dry Forest around Lake Dzani Bunduni



Fig.2 : Recovery diagram of the Bunduni Dry Forest

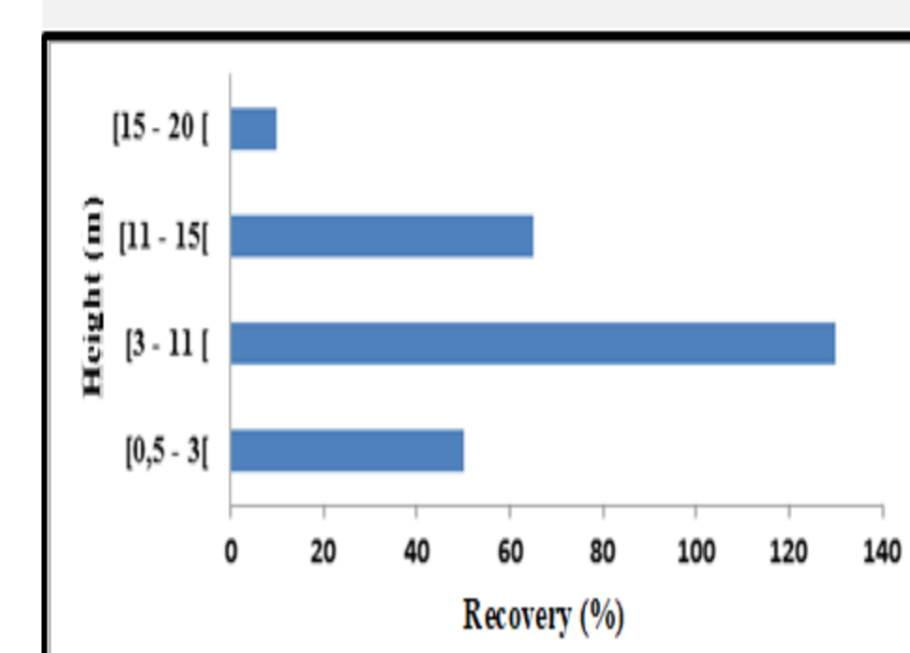


Fig.3 : Population structure of the Bunduni Dry Forest

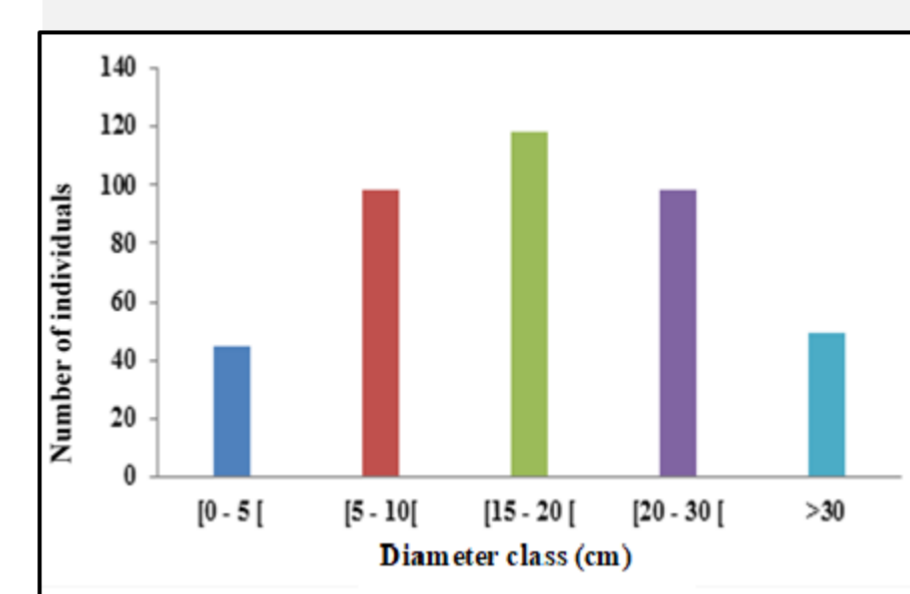


Table : Floristic wealth of studied Bunduni dry forest

| Taxa | Family | Genera | Species |
|---------------|--------------|--------|---------|
| Angiosperms | Monocots | 2 | 2 |
| | Dicotyledons | 32 | 51 |
| Pteridophytes | | 1 | 1 |
| | | 35 | 59 |