

REVIEWER'S REPORT

Manuscript No.: IJAR-54504

Title: Comparison of the Floristic Composition of the PNB Biotopes, South of Cote d'A'Ivoire

Recommendation:

Accept as it is

Rating	Excel.	Good	Fair	Poor
Originality		√		
Techn. Quality			√	
Clarity		√		
Significance			√	

Reviewer Name: Dr. Manju M

Date: 26-10-2025

Detailed Reviewer's Report

1. Study Context

Banco National Park, located within Abidjan (Côte d'Ivoire), represents one of West Africa's few remaining dense humid urban forests. The study aims to contribute to its ecological characterization for sustainable conservation.

2. Research Justification

Due to intense urbanization around Abidjan, Banco National Park's wetlands face degradation. Understanding floristic composition and ecological structure is essential for ecosystem protection and management.

3. Objective

The core goal was to compare floristic composition, structure, and ecological characteristics across four forest formations-upland, swamp, riparian, and periodically flooded forests-to inform sustainable management strategies.

4. Site Description

The 3,438.34-hectare park, located between 5°21' - 5°25'N and 4°01' - 4°05'W, plays a critical role in local climate regulation, water purification, and flood control, serving as an ecological buffer for Abidjan.

5. Environmental Threats

Major threats include urban encroachment, pollution, and illegal logging, leading to habitat fragmentation, species loss, and hydrological alteration in the park's wetland ecosystems.

6. Methodological Framework

Two complementary survey techniques were applied:

- **Linear surveys (Gautier method, 1994):** Measured vertical structure and species distribution.

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- **Plot-based surveys:** Conducted within 10×10 m plots to inventory species and assess structure.

7. Sampling Design

In each of the four forest types, a 200 m transect and three 100 m² plots were installed, with 25 m² subplots for regeneration. All individuals ≥5 cm DBH were recorded, measured, and identified.

8. Floristic Inventory and Diversity

A total of 161 species across 50 families were documented.

- Dominant families: Fabaceae and Apocynaceae.
- Most species-rich formation: Riparian forest (80 species).
- Least species-rich: Periodically flooded forest (43 species).

9. Statistical Analysis

A one-way ANOVA indicated no significant differences ($p > 0.05$) in overall species richness among habitats, though riparian forests consistently exhibited the highest diversity.

10. Endemism and Chorological Structure

Guineo - Congolian taxa predominated across formations. Côte d'Ivoire endemics (GCi) varied significantly ($p = 0.0111$), peaking in riparian forests - highlighting their national conservation importance.

11. Species of Conservation Concern

Twelve species with conservation status were recorded:

- **Endangered:** *Hunteria ghanensis*, *Anthostema aubryanum*
- **Vulnerable:** *Carapa procera*, *Laccosperma secundiflorum*, *Acacia kamerunensis*
- **Near Threatened:** *Symphonia globulifera* → 8 out of 12 occurred in wetland habitats.

12. Family-Level Patterns

Fabaceae dominated all formations (11 - 13 species), followed by Apocynaceae. Although inter-habitat differences were not significant, riparian forests maintained the highest floristic variety.

13. Morphological Composition

- Trees dominate all habitats.
- Shrubs show significant variation ($p = 0.00171$), most abundant in upland and riparian zones.
- Lianas thrive in riparian forests, suggesting mild disturbance.
- Herbs remain rare and sparsely distributed.

14. Biological Types

Vegetation comprised mainly megaphanerophytes, microphanerophytes, and lianas.

- Megaphanerophytes highest in riparian zones (7.4 ± 2.23).
- Mesophanerophytes prevalent in upland forests.

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- Some differences were statistically significant ($p < 0.05$).

15. Floristic Richness Trends

Riparian forests' superior species density is linked to rich hydrology and nutrient availability, whereas swamps and periodically flooded areas show reduced richness due to water stress.

16. Anthropogenic Impact

Urban encroachment, logging, and pollution have selectively degraded swamp and flooded forests, favoring disturbance-tolerant species like lianas and altering natural composition.

17. Biodiversity Indices

- Shannon-Weaver Index: High in upland and riparian forests, reflecting structural complexity.
- Pielou's Evenness: Uniform across habitats, suggesting even species distribution.
→ Indicates partial degradation but ecological resilience.

18. Comparative Habitat Dynamics

- Upland forest: Stable, tree-dominated, least disturbed.
- Riparian forest: Highly diverse, liana-rich, dynamic.
- Swamp forest: Moderate diversity, vulnerable to stress.
- Periodically flooded forest: Lowest diversity, heavily impacted by human activities.

19. Conservation and Management Recommendations

- Reinforce buffer zones around wetlands.
- Encourage native species reforestation (Fabaceae, Apocynaceae).
- Conduct regular monitoring of floristic changes.
- Foster community involvement and awareness on wetland conservation.

20. General Conclusion

Banco National Park remains a biodiversity hotspot within an urban matrix, with riparian forests serving as critical refuges for endemic and threatened flora. Despite anthropogenic pressures, the ecosystem retains significant ecological integrity and conservation potential.