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NOTA

QUANTITATIVE DATA ON THE FOREST STRUCTURE OF A SMALL MANGROVE FORMATION IN THE BAY OF NENGUANGE, COLOMBIAN CARIBBEAN

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RESUMEN

Esta nota aporta información cuantitativa sobre la estructura de la pequeña formación de manglar que se encuentra sobre el costado oriental de la Bahía de Nenguange, Parque Nacional Natural Tayrona, con el fin de proporcionar un punto de comparación para eventuales estudios futuros. Se presentan datos sobre zonación, densidad, cubrimiento, altura, diametro a la altura del pecho y área basal.

The small mangrove formation (no more than 4 Ha, estimated from maps of the area) found at the east side of the Bay of Nenguange (11° 20'N; 74°05'W, Tayrona National Natural Park, Colombian Caribbean) has been mentioned several times in the literature dealing with the area, for instance Florez *et al.* (1987), Díaz (1990), etc. To my knowledge, however, a quantitative description of the forest structure of this mangrove formation is nonexistent. Thus the purpose of this note is to contribute such quantitative data in order to permit future monitoring and comparisons with the present situation.

The mangrove formation is surrounding a little coastal lagoon called El Saladal whose existence and depth depends on rainy water thus varying its extension and depth (no more than 2 meters) with the rain patterns (Florez *et al.*, 1987). It is probably the presence of this little flood plane what has made possible the establishment of a mangrove forest, however small, in a place where otherwise there are no, or very little, influence of freshwaters.

The place was visited in May and October, 1993. In the first visit, data on tree height and cover along linear transects were collected. Height (m) was estimated by means of a sextant. Individual cover (m²) was estimated measuring the

diameter of the vertical projection of the tree, assuming circular shape. In the second visit, data on diameter at breast-high (D.B.H., cm) and tree density were collected inside plots of known dimensions, the plots running from the sea border to the lagoon. In order to give estimates of density, the area covered by the plots in the second visit was added up to a total sampled area of 2000 m², and so was the number of trees (449), and the results expressed as number of trees by 0.1 Ha. Results are shown in table 1.

Table. 1 Basic statistics of forest estructural characteristics of a small mangrove formation in the Bay of Nenguange, colombian Caribbean. D.B.H= diameter at breast-height.

SPECIES	N		MEAN±1 S.D.
COVER			
<i>Conocarpus erectus</i>	13	420	32.3±25.3
<i>Avicennia germinans</i>	23	899	39.1±48.9
<i>Rhizophora mangle</i>	17	420	24.7±12.9
<i>Laguncularia racemosa</i>	7	135	19.2±20.2
HEIGHT (m)			
<i>Conocarpus erectus</i>	13	83	6.4±3.6
<i>Avicennia germinans</i>	23	162	7.0±7.0
<i>Rhizophora mangle</i>	17	130	7.6±6.4
<i>Laguncularia racemosa</i>	7	41	5.9±6.1
D.B.H (cm)			
<i>Conocarpus erectus</i>	67	1545.8	23.1±15.5
<i>Avicennia germinans</i>	109	2698.3	24.8±19.4
<i>Rhizophora mangle</i>	165	4327.7	26.2±14.6
<i>Laguncularia racemosa</i>	108	1507.4	14.0±10.8
DENSITY			
<i>Conocarpus erectus</i> 33.5/0.1Ha	<i>Avicennia germinans</i> 54.5/0.1Ha	<i>Rhizophora mangle</i> 82.5/0.1Ha	<i>Laguncularia racemosa</i> 54/0.1Ha
BASAL AREA (m ²)			
<i>Conocarpus erectus</i> 2.1/0.1 Ha	<i>Avicennia germinans</i> 4.2/0.1 Ha	<i>Rhizophora mangle</i> 5.8/0.1 Ha	<i>Laguncularia racemosa</i> 1.3/0.1 Ha

Figures 1, 2 and 3, respectively, show the frequency distribution of cover, height and D.B.H. in the forest. Table 1 includes statistical information which is extractable from the frequency distributions but is not obvious.

Four mangrove species are present in the area: *Conocarpus erectus*, *Avicennia germinans*, *Rhizophora mangle*, and *Laguncularia racemosa*. The trees of these species are not evenly distributed but a general zonation can be distinguished with *R. mangle* facing the marine shore to the north of the formation (or in its absence a

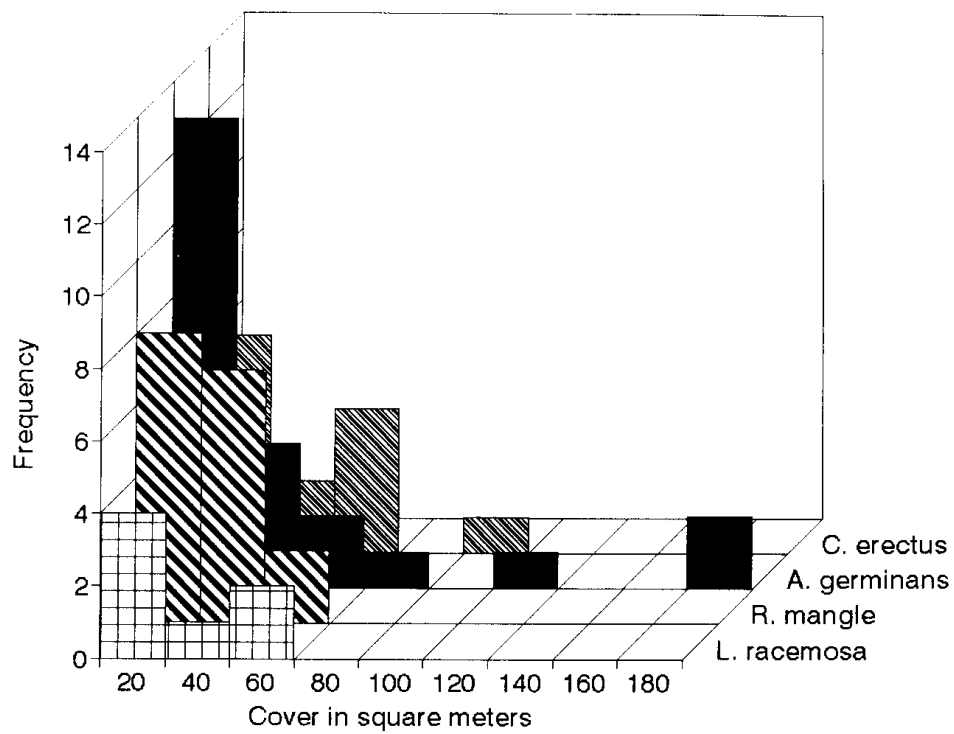


Figure 1. Tree cover frequency distribution of a small mangrove formation in the Bay of Nenguange, Colombian Caribbean. See text for acronyms.

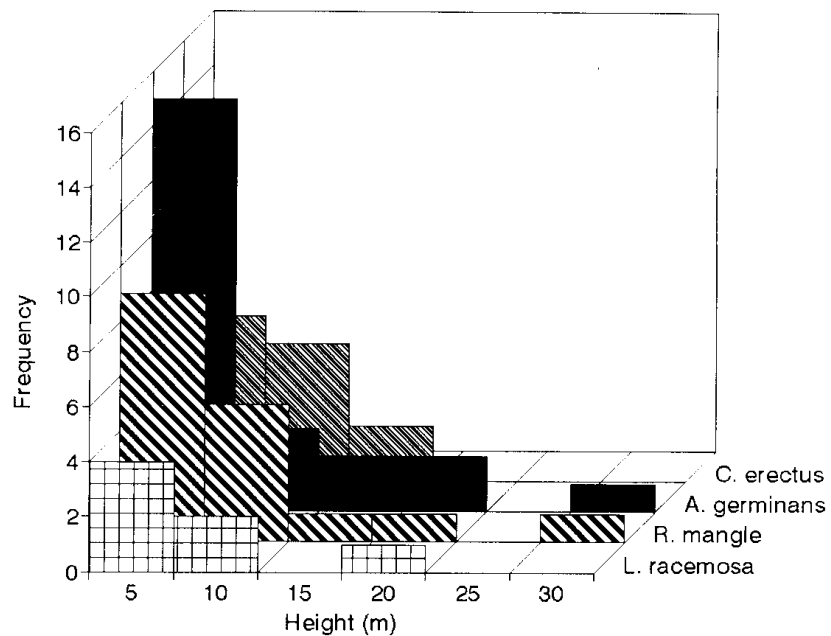


Figure 2. Tree height frequency distribution of a small mangrove formation in the Bay of Nenguange, Colombian Caribbean. See text for acronyms.

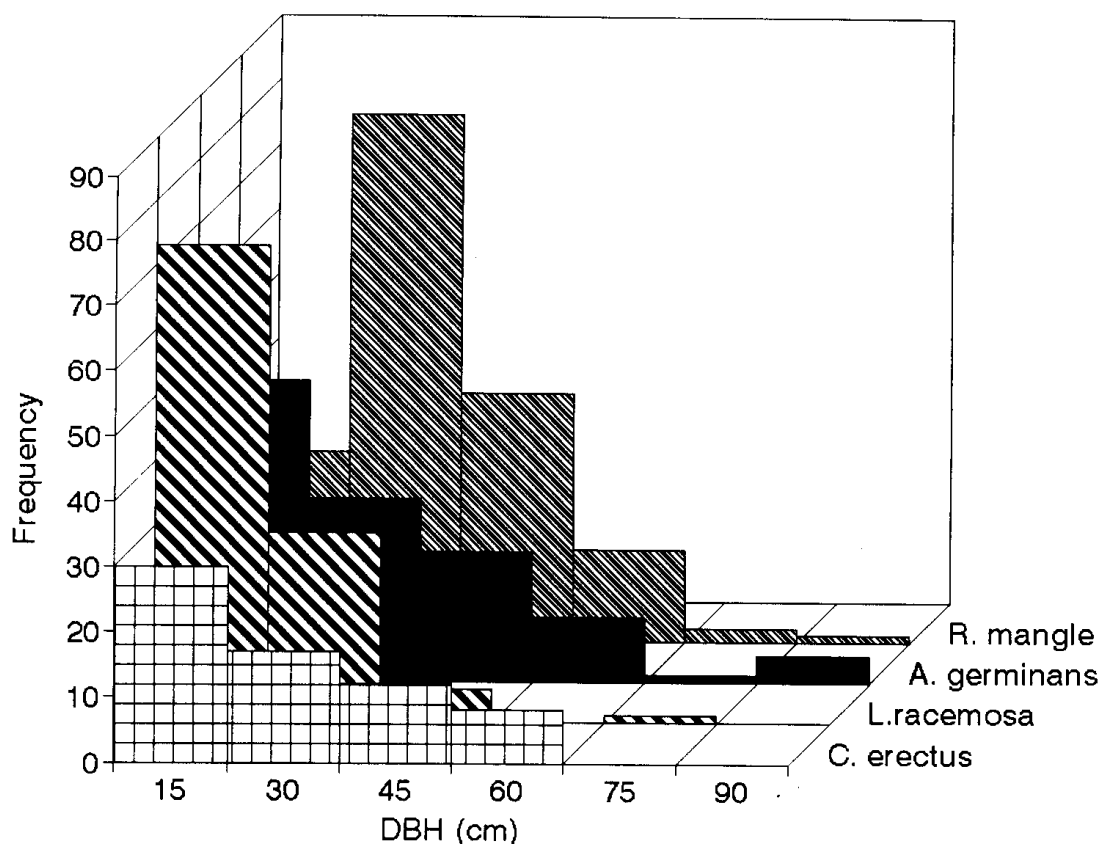


Figure 3. Diameter at breast-height (D.B.H.) frequency distribution of a small mangrove formation in the Bay of Nenguange, Colombian Caribbean. See text for acronyms.

sandy beach), followed by a mixture of *C. erectus* and *A. germinans*, than a mixture of *L. racemosa* and *A. germinans* with some trees of *C. erectus* and, to the lagoon border, a mixture of *L. racemosa* and *R. mangle*.

When a comparison is done with the results in Araujo and Polania (1985) for the Canal del Dique delta (their Table 2) it is possible to say that this mangrove formation is a mature one. It shows lower tree density and higher basal area (but lower height), which are indicatives of maturity. The lower height, however, suggests some physiological constrain.

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