First Report of *Rhizophora racemosa* (Rhizophoraceae) in the Wider Caribbean Region

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Introduction

The genus *Rhizophora* is the most common of the three genera found in coastal mangrove ecosystems. Ten *Rhizophora* taxa have been recognized worldwide in two bio-geographical regions: the Indo-West-Pacific (IWP) and the Atlantic-Caribbean-Eastern-Pacific (ACEP) (Duke *et al*. 2002).

In the ACEP region, three species of the genus *Rhizophora* have been recognized: *R. mangle* (L.), *R. harrisonii* Leechman and Leechman, and *R. racemosa* G.F.W. Meyer (Figure 1).

ACEP *Rhizophora* distribution

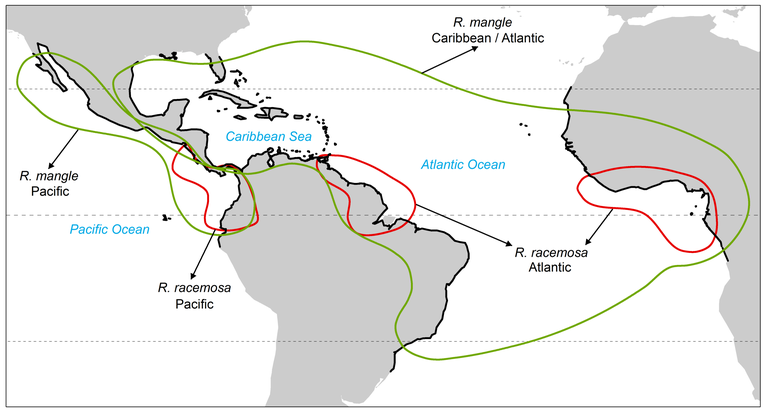

Figure 1. Distribution of the taxa *Rhizophora* throughout the Atlantic-Caribbean-Eastern-Pacific (ACEP) biogeographical region.

Sampling areas

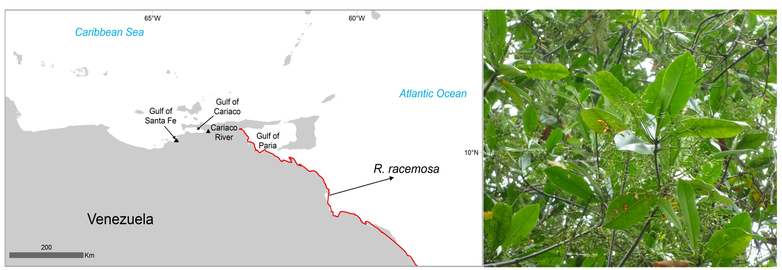

Figure 2. Cariaco River and Gulf of Santa Fe in the Caribbean coast of Venezuela where the specimens were collected. The distribution of *R. racemosa* along the Venezuelan Atlantic coast is shown.

Results

The presence of *R. racemosa* in the Cariaco River and the Gulf of Santa Fe reported here represents a new finding for the Venezuelan Caribbean coast and broadens the distribution of the species in the ACEP region (Figure 2).

The number of sequential bifurcations in the inflorescence was the diagnostic character used to determine the species in the samples examined, both those deposited in the herbariums and those collected in the Gulf of Santa Fe and the Cariaco River, which had inflorescences with 6 to 10 bifurcations. The number of flowers per inflorescence counted *in situ* was 47 to 100 (Figure 3).

Figure 3. *Rhizophora racemosa* Meyer. Inflorescence of a specimen collected in the mangrove forests of the Gulf of Santa Fe. The order of the bifurcations is indicated.

Acknowledgements

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Discussion

The restricted distribution of *R. racemosa* along the more humid areas along South America's eastern coast from Brazil to Venezuela (Gulf of Santa Fe) can be explained by the reduction of its range during the Miocene-Pliocene, and more recently during the last glacial period.

We can postulate two possible pathways for the recent dispersal and colonization of *R. racemosa* throughout Venezuela's eastern Caribbean coast. First, through an ancient channel (The Humboldt Channel) connecting the gulfs of Paria and Cariaco, and second, by means of migration and dispersal along the northern coast of the Paria Peninsula and Araya.

It could also be proposed that populations of *R. racemosa* in the Gulf of Santa Fe acted as areas of refuge, and dispersed by long-distance dispersal LDD (Cerón-Souza *et al*., 2010) to the Gulf of Cariaco at the end of the Quaternary. This colonization, however, may have occurred more recently due to the step-by-step process of LDD from the Atlantic coasts of southern Venezuela (Orinoco River), to the Gulf of Paria, Trinidad and the gulfs of Cariaco and Santa Fe, as a result of The Guiana Current.

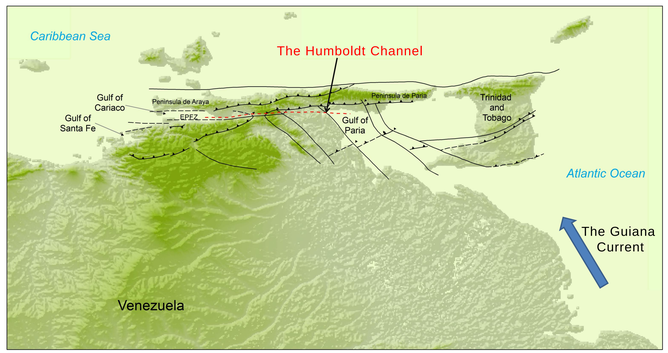

Figure 4. Map of NE Venezuela. Location of geographical features referred to in the text, showing The Humboldt Channel and The Guiana Current. EPFZ: El Pilar Fault Zone.

Research into the genetic variability of *R. racemosa,* with the purpose of assessing if colonization or re-colonization processes originated in the populations located along the Atlantic coast, and determining the direction of colonization on the South American Atlantic coast, will allow to answer some of the questions regarding the diversification and dispersal of *R. racemosa,* and to establish if extinction processes can account for the current disjunction in parts of the Caribbean region and the western Atlantic.

References

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