

PALYNOLOGY IN COLOMBIA, ADVANCES IN THE CENOZOIC FROM THE CARIBBEAN AREA

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AN OVERVIEW OF PALYNOLOGY OF COLOMBIA

In Colombia, the study of palynology began in the 1950s. Present a substantial number of palynological publications exist in Colombia, approximately 111 articles in indexed journals, most are concentrated in areas related to petroleum exploration (Plata *et al.* 2023, Pardo-Trujillo *et al.* 2022). In a temporal summary, Paleozoic has been studied and reported in Eastern Llanos basin. The palynology of Mesozoic shows for the Triassic-Jurassic a unknown palynological evidence, however Cretaceous has been studied in Eastern Cordillera, the Upper Magdalena Valley, and Catatumbo basins. In the Cenozoic, the Paleogene palynology is documented in a lot of locations mainly in Llanos, Llanos foothills, the Eastern Cordillera, the Middle Magdalena Valley, Catatumbo, and in some isolated spots in La Guajira and recent contributions for Caribbean. Finally, the Neogene has been document in several basins such as Eastern Cordillera and the Llanos foothills, however, Amazon being notable (Plata *et al.* 2023). Despite this volume of data published, much palynological information cannot be disclosed due to the confidentiality inherent in the industry, resulting in areas of the country with restricted or limited information. As is the case of Sinú-San Jacinto Basin in the Colombian Caribbean (NW South America), where the last Cenozoic publications were made in the 1980s by Duenas (1980, 1983, 1986).

PALYNOLOGY OF THE CENOZOIC FROM CARIBBEAN REGION – NEW DATA

In the Colombian Caribbean region, the Sinú-San Jacinto basin (SSJB) has been considered a frontier basin and has undergone thorough study over the past decade, presenting a unique opportunity to fill the knowledge gap. The University of Caldas, the Instituto de Investigaciones en Estratigrafía (IIES), the Agencia Nacional de Hidrocarburos (ANH), and the Ministry of Science and Technology of Colombia, has designed a special program of scholarships, allowing the publication of a significant portion of the data obtained in the last decade of research in this region.

Plata-Torres *et al.* (2024), from of a composite section of 14 cores drilled from SSJB (NW South America), and the palynological study of 716 samples, provides for the first time a Cenozoic palynostratigraphic zonation scheme for this region (Figure 1). Twelve palynological zones spanning Late Paleocene to Plio-Pleistocene are proposed for the Caribbean, some of which differ from those proposed for the Llanos and Llanos Foothills basins (Figure 1).

The simultaneous study of calcareous nannofossils and planktonic foraminifera allowed an independent calibration of the palynomorph assemblages to the international chronostratigraphic chart. Some of the calcareous microfossil results have been published in a special issue for the Caribbean (Vallejo *et al.* 2023, Celis *et al.* 2023, Dominguez *et al.* 2023, Duque-Castaño *et al.* 2023, Plata-Torres *et al.* 2022).



Main spores and pollen used as biostratigraphic markers in the zonation of Caribbean. 1. Cicatricosisporites dorogensis, 2. Cyatheacidites annulatus, 3. Crassoreticulites vanraadshoovenii, 4. Polypodiaceoisporites usmensis, 5. Bombacacidites muninaneorum, 6. Cyclospheera Scabrate, 7. Fenestrites spinosus, 8. Foveotricolporites etayoi, 9. Foveotriporites hammenii, 10. Grimsdalea magnaclavata, 11. Malvacipolloides maristellae, 12. Mauritiidites franciscoi minutus, 13. Multiareolites formosus, 14. Perisyncolporites pokornyi, 15. Perfotricolporites digitatus, 16. Psilatricolporites pachydermatius, 17. Proteacidites triangulatus, 18. Rettistephanoporites crassiannulatus, 19. Rugosyncolpites macrocaribiensis, 20. Spirosyncolpites spiralis, 21. Striatopollis catatumbus

Figure 1. A summary of Colombian Caribbean palynozonation supported by calcareous microfossil assemblages (Vallejo et al. 2023, Celis et al. 2023, Dominguez et al. 2023, Duque-Castaño et al. 2023, Plata-Torres et al. 2022, ANH-Ucaldas, 2020) and their comparison with the Llanos and Llanos Foothills zonation (Jaramillo et al. 2011).

Plata-Torres et al. (2024) suggests variations in the biostratigraphic ranges of some palynomorphs, and described new species with stratigraphic value. In addition, shows evidence of reworking in some stratigraphic intervals suggesting makes it necessary to be careful about the last appearance record if microfossils in exploration and geological mapping. Finally, the high diversity and abundance of dinoflagellates cyst in some stratigraphic intervals require more detailed study.

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