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Foraminiferal, ostracode and radiolarian biostratigraphy of the Campanian–Maastrichtian and K/P boundary of synorogenic basins of Cuba

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Late Cretaceous (Campanian – Maastrichtian, main subject of this study) and Paleogene microfaunal assemblages from synorogenic basins of central and western Cuba have been investigated on the basis of 133 samples from 9 outcrop sections. Foraminifera and ostracodes are scarce and/or poorly preserved in these strata. Nevertheless, systematic analyses in this study reveal 50 genera and 65 species of foraminifera. Ostracodes are particularly rare, with only 13 genera and 11 species determined. The main biohorizons evidenced by microfossil successions are characterized, and biostratigraphic, paleoecological and biogeographic implications of the various microfaunas are re-evaluated, thus contributing to the overall update of Cuban micropaleontology. In spite of their low diversity (13 genera and 15 species identified), radiolarians are frequent in most sections. They permit to erect a regional biozonation of the lower to possibly middle Eocene (*Stylosphaera coronata* Taxon Range Zone) at La Conchita section, western Cuba, where the Paleocene-Eocene boundary is recorded. Occurrences of Late Cretaceous larger foraminifera are documented, and correlated with FADs and LADs of Tethyan zonal taxa described in the international literature. Three Maastrichtian planktonic foraminiferal biozones of regional applicability are identified (in ascending order): *Globotruncanella minuta* (new), *Trinitella scotti* and *Racemiguembelina fruticosa* Interval Zones. Planktonic foraminifera also permit recognition of the undifferentiated P0/P α -P1b zonal succession within an interval less than 4 m thick at Loma Capiro (Santa Clara Formation), central Cuba, thus confirming the correlation of these strata with the K/P boundary global event. Micropaleontological results from another K/P boundary section in western Cuba (Miraciolo locality, Cacarajícara Formation) point to the regional prevalence of shallow neritic paleoenvironments and inextricable mixing of pre-Campanian and Maastrichtian shallow water assemblages (*e.g.*: larger and smaller benthic foraminifera, rudists and calcareous algae). These have been partly remobilized from coeval end-Cretaceous sediments, and partly reworked

from older Cretaceous carbonate platforms exhumed at that time. The occurrence of an important earliest Danian unconformity in the synorogenic basins of Cuba is once again demonstrated. A probable late Campanian – early Maastrichtian age span is inferred for the end of Cretaceous volcanism in Cuba, based on lithological and paleontological evidence from Loma Capiro locality (micropaleontological dating of Late Cretaceous marine deposits associated with tuffitic materials, tectonically recurrent onto Danian strata). The remarkable endemism and restricted geographic distribution of some western Tethyan marine ostracode genera during the Senonian permit to distinguish a coeval biogeographic unit (the Caribbean Subprovince) within the broader American Province. The distribution pattern of Late Cretaceous larger foraminifera also supports the endemism of Caribbean benthic microfaunas in the Campanian – Maastrichtian.