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NEW GYMNOSPERM RELATED WITH GNETALES FROM THE CRATO PALAEOFLORA (LOWER CRETACEOUS, SANTANA FORMATION, ARARIPE BASIN, NORTHEASTERN BRAZIL)

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A new fossil plant related with Gnetales is proposed. This plant occurs in the exposed sedimentary rocks of the Brazilian palaeoequatorial region of northern Gondwana that belong to the Crato Member. This unit of the Santana Formation is dated as Late Aptian and consists of horizontal strata of thin laminated plate-like limestone. Its deposition was under lacustrine flooding conditions, terrigenous to carbonate sedimentation, in a continental lacustrine system with several shallow and wide lakes and that evolved in a palaeoequatorial belt and under warm, semiarid climate. Gnetales has attracted attention because of its potential for understanding the phylogeny of seed plants, despite of to be poorly documented in the fossil record. The gnetalean gymnosperms are a conflicting group being considered the closest living relatives of the angiosperms, associated with conifers, or even derived from them or yet controversial group. Their palynological record begins and becomes widespread in the Triassic of the northern Hemisphere and decreases in the Jurassic. A second radiation occurs in the mid-Cretaceous when they reach low-palaeolatitudes being, with angiosperms, one of the most characteristic components of the African-South Province, after their register becomes scarce. The fossil record of pollen documents that the three extant genera are the relictual living remnants of a group of plants that was once more widespread and much more diverse. Previously, diverse plant mega and microfossils with gnetalean affinities were noted to the Araripe Basin record, but only polyplicate pollens are broadly described. Recent studies of the Lower Cretaceous sedimentary rocks in Brazil provide important new data about the occurrence of the Gnetales. The specimens here studied are excellently preserved on the morphological and anatomical features. They carry cylindrical and articulate stalks that bear parallel longitudinal grooves. Two opposite branches with oblong parallel-veined leaves (inserted oppositely to pairs in the nodes) emerge from the basal portion stalk. The roots constitute a dense fascicled system and exhibit a central furrow. The surface from the specimens exhibits anatomical details such as epidermic and vascular bundle organization. Thin strobilar structures emerge oppositely from the nodes. The cylindrical and woody morphology of the stalk and branches as well as the general organization (with stalk and dense, fascicled roots) indicate a woody plant while the small size suggests that it was a short shrub. This plant shares with gnetaleans characters, such as woody habit, leaves and branches oppositely inserted, distinct nodes (typical of the Ephedraceae and Gnetaceae families), parallel-veined leaves and also strobilar reproductive structure. This plant would live near of the shallow lacustrine or fluvial environments, maybe in the stream margins, palaeoenvironment already suggested to the Crato Member and other northern Gondwana parts. Contribution to FAPESP Project: 03/09407-4.