



New data of the Ordovician glaciation in Paraná basin - Brazil

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The record of the Ordovician-Silurian glaciations in the South-America is widely observed in different basins. In the Brazilian intracratonic basins three glacial events are attributed to Silurian, and one event is recorded to Ordovician. These events are marked by diamictites. Normally, marine shale and siltstones overlain the diamictites. The diamictites aren't direct dated and its ages are obtained by correlation with similar events in the others basins and by stratigraphic positions in the sedimentary record. In the Paraná basin, the Vila Maria and Iapó formations are associated to the Ordovician-Silurian glacial event. The Vila Maria Formation crops out in the north and northwest border of Paraná basin, named Alto-Garças sub-basin. These units is composed by four facies associations: (I) massive diamictite with sandstone interbeds; (II) massive argillite and shale; (III) interstratified siltstone, and (IV) stratified sandstone. The facies characteristics indicate that unit was deposited in environment evolution from an initial glacial conditions, which are progressively substituted by glaciomarine conditions (eustatic and isostatic post-glacial phases). The Iapó Formation is recorded in the Ponta Grossa structural arc in the east border of Paraná basin (Apucarana sub-basin). This unit is composed by diamictite and thin beds of siltstone and shale. The diamictite shows a polimitic gravel and blocks, poorly sorted, supported by a silty to clay matrix. The siltstone and shale present a laminated aspect. The faceted and striated clasts show the glaciation influence in the deposition. This faciologic framework permits to infer that the sediments were deposited close an ice cap. In literature, both units are considered as coeval and the diamictites observed in the base of the units are defined as a glacial mark. The new ages of the diamictites obtained in this research from Vila Maria and Iapó units permit to propose that there is a diachronism between the north and south record of the glacial episode, in the Paraná basin. The fresh diamictite matrix samples taken from two section of the Iapó Formation have been analyzed for radio-

metric age determination using the Rb-Sr analysis techniques. The Rb-Sr age value has been calculated from an isochron diagram. The isochron age obtained from the diamictite matrix of the Iapó Formation was 456,4 +/- 6,4 Ma. The age was interpreted as the minimum depositional age of the Iapó Formation. This age is in accordance with the Hirnantian glaciation observed in the north Gondwana. The diamictite of the Vila Formation has been dated using the palynological standard method. The matrix samples collected in Vila Maria diamictite show a diverse cryptospore assemblage composed by *Tetraedraletes medinensis*, *Rimosotetras problemática*, *Velatitetras rugosa* e *Velatitetras* sp. This assemblage is very similar with those described from Vila Maria shale and it yielded a compatible Rhuddanian-Aeronian age. This result is comparable to the early Silurian glacial episode described in the north intracratonic Brazilian basins and the adjacent Peru, Bolivia and Argentina basins. The new data presented herein permit to refine the palaeogeographic and palaeoclimatic model to Ordovician-Silurian time interval and support the polar wander of the southern pole.