

**SIMPÓSIO INTERNACIONAL
SOBRE OS
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NA AMÉRICA DO SUL**



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THE PARANÁ BASIN UPPER PERMIAN AND LOWER MESOZOIC STRATIGRAPHIC SUCCESSION

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The Paraná sedimentary basin stratigraphic column has undergone through a series of revisions recently concerning the limits of certain specific stratigraphic units and their depositional environments (Rocha-Campos, 1967; Northfleet et al., 1969; Landim, 1970; Fúlfaro, 1970; Mendes, 1967 and 1971; Fúlfaro and Landim, 1972). From the analysis of these new concepts the old ideas concerning the regional unconformities could be redefined. Strata of the Paraná basin here considered comprise the Passa Dois Group which has been considered to be older than late Permian, on the basis of the occurrence of certain fossils. These fossils occur below a supposed regional unconformity and near the top of the group as currently defined. The unconformity has been used to separate the Passa Dois Group from the overlying Botucatu Formation; the latter unit has been considered to range from Late Jurassic to Early Cretaceous in age.

A breccia conglomerate is placed at the base of the Botucatu Formation. This breccia conglomerate in a more detailed analysis shows more close relationships to depositional environment changes than to a final process of a long period of erosion and reworking. In many places the breccia is more accurately described as a fossil soil horizon. In others a gradual passage seems to be rule between the two units. The stratigraphic position of this breccia is not always the same, sometimes occurring between the Passa Dois siltstones and in others already in the Botucatu sandstones, above the supposed regional unconformity.

Environmental analysis of the Passa Dois Group indicates an evolution from lacustrine to

fluvial conditions suggesting the gradual filling of the basin. The introduction of red beds high in the Passa Dois section may be interpreted as indicating increasing aridity climaxing in Botucatu deposition by intermittent streams and sand dunes. Thus Botucatu sedimentation follows naturally after Passa Dois deposition without a significant hiatus. This contention is supported by the discovery of *Lycopodiopsis derbyi* (similar to forms occurring in the Passa Dois Group) in Botucatu strata (Souza et al., 1971).

The 130-140 m.y. radiometric age for Botucatu derives from misinterpretation of intrusive sills as flows (Melfi et al., 1962; Fúlfaro et al., 1967; Fúlfaro, 1970).

Previous work has not identified discontinuities in sedimentations from the initiation of glacial deposition represented by late Carboniferous Tubarão Group to the close of Passa Dois deposition, except at the margins of the basin. Consideration of the periglacial environments of deposition of the Tubarão Group suggest that a number of local unconformities may be present (Fúlfaro and Landim, 1972; Landim and Fúlfaro, 1972; and Soares, 1972); significant abrupt changes in Tubarão sedimentation suggest the presence of one or more regional unconformities within the group. Such regional unconformities are not necessarily related to shifting depositional sites of glacial sedimentation, but may be response to basin-wide tectonic events, one of which may have terminated the glacial phase while causing uplift and emergence of the eastern margin of the basin. A similar relatively short term event is here considered to be represented by the previously accepted top of the Passa Dois Group greatly dimi-

nishing the time gap believed to exist at this point in the stratigraphic succession.

The flood plain conditions existing in the basin margins at the close of Passa Dois sedimentation (Rio do Rasto Formation) gradually move to the basin center with the diminishing of subsidence conditions and represents the basin filling at this time with great changes in the depositional environment. The uplift of marginal areas in some regions were relatively strong with the removal of entire parts of the Permian section as in Mato Grosso State. A shift of depositional sites was the start of the Botucatu basal section deposition (Pirambóia facies), following the Rio do Rasto deposition in a increasing aridity. The age of the Botucatu basal section would be at least Lower Triassic.

The thesis of this paper is that the breccia conglomerate previously placed at the base of the Botucatu Formation and considered to mark the beginning of Mesozoic deposition is more accurately considered to represent a less significant discontinuity with Late Jurassic accumulation marked by the basaltic flows of the Serra Geral Formation.

Acceptance of these points would suggest a close age relationship of Passa Dois — Botucatu deposition spanning Permo-Triassic time. These revised age assignments would bring the history of the Paraná basin into conformity with other Gondwana areas.

RESUMO

A discordância entre o Grupo Passa Dois (Permiano Superior) e a Formação Botucatu (Jurássico Superior-Cretáceo Inferior) é aqui considerada como representando uma discontinuidade de menor significado, seguida no Jurássico Superior pelos derrames basálticos da Formação Serra Geral. Um evento tectônico de curta duração teria ocorrido após a deposição do Grupo Passa Dois, envolvendo, contudo, um intervalo de tempo de menor monta. Essas conclusões são baseadas nos seguintes dados: a) descoberta de *Lycopodiopsis derbyi* (similar a formas que ocorrem no Grupo Passa Dois) em estratos da Formação Botucatu; b) análises ambientais do Grupo Passa Dois indicam uma evolução de condições lacustres para fluviais, sugerindo um assoreamento gradual da

baía. A presença de camadas vermelhas primárias no topo do grupo pode ser interpretada como um aumento progressivo das condições de aridez que teve o seu clímax na deposição Botucatu. A sedimentação Botucatu (fácies basal Pirambóia) seria a sequência natural da deposição Passa Dois, sem um hiato significativo; c) A idade radiométrica de 130-140 milhões de anos para a Formação Botucatu deriva de erro na interpretação de sills intrusivos como derrames. Esses fatos sugerem uma relação de idade muito próxima entre as deposições Passa Dois-Botucatu através do intervalo que abrange o limite Permo-Triássico.

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