

to consolidate the priority of the Russian science. During the last decade, many versions of the General Scale of the Carboniferous system (Harland, et al., 1982, 1990; Cowie, Basset, 1989; Wagner, Winkler Prins, 1994), utilised the Carboniferous horizons of the unified scale of the Russian Platform (fully or partly) as stages. Most of these horizons correspond to several foraminiferal, conodont and other fossil zones and do not principally differ from the Lower and Upper Carboniferous stages of Western Europe, distinguished in England and Belgium.

Taking into account the appeal of RISC of Central regions and the results of previous questioning, the Enlarged Bureau of the Carboniferous Commission of

the ISC took the resolution to distinguish, as an exception, substages with their own names within the Moscovian stage of the General Scale of the Carboniferous, using names of regional horizons: (in ascending order): Vereyan substage, Kashirian substage, Podolskian substage, Myachkovian substage. The RISC of the Central regions were required to submit material on stratotype sections of units of the Moscovian to the Carboniferous Commission.

The word SUBSTAGE should be used in the English translation of the names of horizons of the Bashkirian and Upper Carboniferous for the sake of mutual understanding.

4. In connection with the ISC Bureau Resolution of March 2,

1992, the position of the Carboniferous/Permian boundary in the General Scale has been changed and, thus, the position of the upper boundary of the Gzhelian in the regional scale of the Russian Platform. The Melekhov Horizon was approved as the upper horizon of the Gzhelian in the regional scale of the Russian Platform; its stratotype is in the Melekhov-Fedorov Quarry and exposures of the Moshechikhin Ravine, as well as near the Klyazmensky Gorodok village. The range of the fusulinid corresponds to the fusulinid zone *Daixina bosbytauensis*, *D. robusta* (M. Kh. Makhлина, T.N. Isakova, in press).

CARBONIFEROUS OF BRAZIL

A.C. Rocha-Campos and L.E. Anelli, Instituto de Geociências, Universidade de São Paulo, e-mail: acrcampo@usp.br

Contribution to the Late Paleozoic stratigraphy of the Parnaíba Basin

Lima Filho, F.P.¹

Anelli, L.E.²

¹ Departamento de Geologia - Universidade Federal do Rio Grande do Norte - UFRN, Campus Lagoa Nova, Cx. Postal 1639, CEP 59072-970 - Natal - RN, Brazil; e-mail: pinheiro@geologia.ufrn.br

² IG/USP, anelli@usp.br

The late Paleozoic-Triassic stratigraphic sequence of the Parnaíba Basin, Northeastern, Brazil, represents a transgressive-regressive cycle bounded by strong unconformities. The lower one occurs between the Poti (Mississippian) and Piauí (Pennsylvanian) formations and

the upper one separates the Sambaíba formation (Triassic) from the overlying Passos Bons formation. Marine regression at the end of the Mississippian has been assigned to the eohercianian orogeny (Goes et al., 1990) as well as to the Gondwana glaciation in Southwestern Brazil (Lima Filho, 1991). This orogeny resulted in extensive erosion and disconformity between the Poti and Piauí formations. Wide sea connection between the Parnaíba and Amazonas basins became discontinuous during the Pennsylvanian. Analysis of depositional systems in the Piauí Formation allowed reconstruction of the Pennsylvanian paleogeography (Lima Filho, 1991). The lowest beds of the Piauí Formation were deposited in a desert environment associated with secondary fluvial and lacustrine systems (Lima Filho & Rocha-Campos, 1992; Lima Filho & Rocha-Campos, 1993). In the middle portion of the section eolian sands pass transitionally to mudstones and evaporites. Rising of sea level and resulting transgression led to development

of an extensive evaporite basin around 400 km in length, containing thicknesses of up to 15 m of sediments associated with marine carbonate platforms at the northeastern part of the Parnaíba Basin. On the northeastern portion of the basin the eolian coastal sands intercalate with marine carbonate, small deltaic fans reworked by storms and beach sands constituting shallowing upward cycles (Lima Filho et al., 1995, Fig. 1). Towards the top of Piauí Formation, eolian sediments and evaporites expand in areal extent but form thinner sequences. Carbonates yielded a rich marine invertebrate fauna comprising bivalves, gastropods, cephalopods, brachiopods, trilobites, crinoids, forams and other microfossils of Morrowan-Atokan age (Kegel, 1951, Campanha & Rocha-Campos, 1979; Lima Filho, 1991; Anelli et al., 1992; Anelli et al., 1993; Anelli, 1994). They represent the latest marine environment in the basin. A subsequent regressive phase in the Permian is record by the deposition of evaporites,

sand seas, tidal flats and small deltas of the Pedra de Fogo Formation. The paleogeographic evolution was accompanied by a climate change towards arid conditions during the Permian that culminates with extensive desert environments in the Triassic.

References

Anelli, L.E. 1994, São Paulo, 148p. (Dissertação de Mestrado, Instituto de Geociências/USP).

Anelli, L.E.; Rocha-campos, A.C. & Lima Filho, F.P. 1992, 37th Congr. Bras. Geol., São Paulo, Boletim de Resumos Expandidos, 1, Sessões Temáticas, p.502.

Anelli, L.E.; Simões, M.G. & Lima Filho, F.P. 1993, Cong. Bras. Paleontol. São Leopoldo, Sociedade Brasileira de Paleontologia. Resumos, p. 108.

Campanha, V.A. & Rocha-Campos, A.C. 1979. Boletim do Instituto e Geociencias da Universidade de São Paulo, 10:57-67. Kegel, W. 1951, Boletim. Divisão de Geologia e Mineralogia, 153, p.1-38.

Goes, A.M.O.; Souza, J.M.P. & Teixeira, L.B. 1990. Boletim de Geociencias da Petrobras, 4:55-63. Lima Filho, F.P. 1991, XII Cong. Bras. Paleont. São Paulo, Sociedade Brasileira de Paleontologia, Resumos, p.44.

Kegel, W. 1951, Boletim. Divisão de Geologia e Mineralogia, 153, p.1-38.

Lima Filho, F.P.; Rocha campos, A.C. 1992, Bol. IG_USP, Instituto de Geociências, Universidade de São Paulo, Pub. Especial 12 p. 67-68.

Lima Filho, F.P. & Rocha Campos, A.C. 1993, Resumos. Acad. Bras. Ci., 65(3) p.324-325.

Lima Filho, F.P.; Machado, M.F.; Córdoba, V.C. & Souza, D.C. 1995, XVI Simpósio de Geologia do Nordeste. Recife, 1995. Boletim 1, p. 370-373.

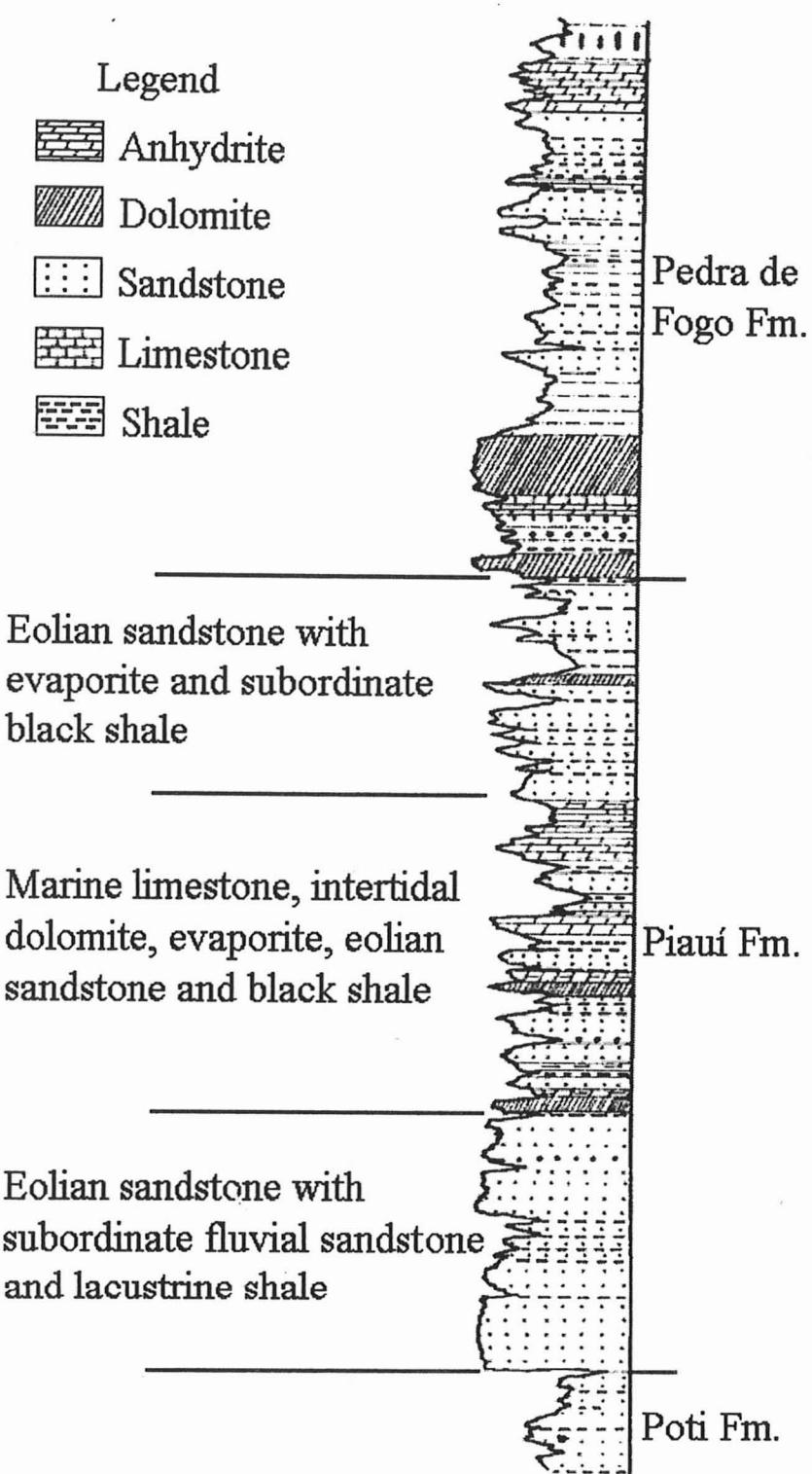


Fig. 1. Schematic lithostratigraphic section of the Piauí Formation (Pennsylvanian), Parnaíba basin, Brazil.