669
Correlation of the Kaş Formation (Permian, SE Turkey) with the Ga'ara Formation (North Iraq) – a contribution to Arabian Plate stratigraphy

Ellen Stolle

Westfälische Wilhelms-Universität Münster, Germany, e.stolle@uni-muenster.de

The approximately 50 m thick upper part of the Permian Ga'ara Formation is exposed mainly as sandstones at the type locality in the Ga'ara Depression in western Iraq. From the subsurface of the same area, intercalations of sand- and claystones have been reported. The equivalent of the Ga'ara Formation, according to previous studies of Arabian Plate stratigraphy, is missing in southeastern Turkey, c. 450 km northward from the Ga'ara Depression. In this study, however, relatively contemporaneous strata are now recognized in the Kaş Formation. The Kaş Formation in southeastern Turkey consists of grey to black organic-rich claystones and yellow sandstones. The palynological assemblages from the lowermost beds of these dark, fine-grained clastics can be correlated palynologically with assemblages previously reported from claystones of the upper Ga'ara Formation at a depth of 55 m - 60 m in the B.H.100/B/85 well. Biostratigraphically significant taxa for the correlation of the lowermost Kaş Formation with the fossiliferous interval in the B.H.100/B/85 well include among others *Verrucosisporites* sp. cf. *V. planiverrucatus* Imgrund 1960 (*sensu* Balme 1970), *Diaphanospora rutbaensis* Nader, Khalaf and Yousif 1993 and ?*Florinites balmei* Stephenson and Filatoff 2000 (in Iraq as *F. millotti*). The Kaş Formation is assigned to the middle to late Wordian, based on foraminiferal age control. Recent studies of the stratigraphy of Iraq consider the Ga'ara Formation to be Late Carboniferous to Middle Permian, as young as middle Wordian. According to these age assignments, *V.* sp. cf. *V. planiverrucatus* and *D. rutbaensis* have, in southeastern Turkey and Iraq, their last occurrences in strata of middle Wordian age. No major unconformities nor evidence for other stratigraphic gaps have been recognized during palynological investigations of both, the outcrop and subsurface sections of the Kaş and overlying Gomaniibrik formations (middle Wordian to Changhsingian), from various southeastern Turkey localities. Comparison of the palynological assemblages from southeastern Turkey with those from the Ga'ara Formation and the overlying Chia Zairi Formation show a similar, relatively continuous succession of Permian strata of Iraq. This is contrary to some previous studies, which interpreted the presence of a major unconformity between the Ga'ara and the Chia Zairi formations.

670
Palynostratigraphy and environment of "Strunian" and Visean diamictites from South America (Western Gondwana)

Maurice Streel

University of Liège, Belgium, Maurice.Streel@ulg.ac.be

Diamictites and other associated sediments from the "Strunian" Cabeças Formation and from the Visean Poti Formation in the Parnaiba Basin (Brazil), from the "Strunian" to Visean Toregua Formation in the Madre de Dios Basin (Bolivia) and from the "Strunian" to Visean Itacua (Saipuru) Formation of the Tarija Basin (Bolivia) contain very abundant and well preserved palynomorphs, most being reworked from older sediments. The Western European miospore stratigraphy linked to the conodont stratigraphy allows dating these diamictites. The acritarch stratigraphy being almost always based on assemblage definition is not suitable for comparison with the conodont scale. Only the youngest recorded miospores in the diamictites allow their dating. The delay between the glacial deposition and the melting process accumulating diamictites is investigated. The comparison with miospores from varved sediments and from sediments laterally associated with the diamictites provides evidence for their almost contemporaneousness. Quick changing and alternating climatic conditions are established in Western Europe at the end of the Famennian and in the late part of the Visean. They allow explaining, for instance, the delusive simultaneity of Late Visean warm climate based on macroplants (The Paraca Flora, Iannuzzi & Pfefferkorn, Palaios 17, 2002) and Late Visean cold climate dated by miospores in diamictites. The polycyclic character of the diamictites examined in Bolivia explains also the divergence of age given to the Itacua (Saipuru) Formation (latest Devonian according to Wicander *et al.*, CIMP Symposium Prague 2006, Visean according to di Pasquo, Rev. geol. Chile 94, 2007). The absence of Tournaisian diamictites and sometimes absence of Tournaisian sediments in Bolivia are confirmed, Tournaisian diamictites being restricted to the Solimões Basin in Brazil. Interruptions in the Mississippian miospore versus sediment record in South America is tentatively explained by cold and dry period with poor vegetation cover and poor soil development alternating with less cold but wetter period allowing richer vegetation cover and ice sheet reaching sometimes coastal marine environments. Largely reworked acritarchs into the Mississippian sediments cast some doubt on the reality of the recent assertion (Mullins & Servais, Rev. P. P., 149, 2008) that the obvious Carboniferous decrease in acritarch diversity should be searched for near the end of the Tournaisian rather than at the end of the Famennian (Riegel, Rev. P. P.,148, 2008).

671
The ecological role(s) of grasses in the Eocene

Caroline A. E. Strömberg

Department of Biology & Burke Museum, University of Washington, U.S.A., caestrom@u.washington.edu

The early evolution of grasses (Poaceae) has long been a subject of debate, due mainly to the group's poor fossil record. Pollen and macrofossils indicate that grasses inhabited several parts of Gondwana and Eurasia by the Eocene; however, it is not clear from these data what grass lineages were present, what their ecology was, and how abundant they were. The use of fossil plant silica (phytoliths) is starting to shed light on these questions. Recent phytolith work has shown that bambusoid and ehrhartoid grasses had evolved by the Eocene, and plant silica records from the Great Plains of North America and Turkey show that closed-habitat grasses formed important parts of Middle-Late Eocene forest vegetation in these areas. Phytoliths from grasses are also diverse and well represented in phytolith assemblages from the Late Eocene of Patagonia, South America, but published data