**A synthesis of Saudi Arabian Devonian palynological data generated from the scientific cooperation between CIMP and Saudi Aramco.**

Philippe Steemans1, Sa’id Al-Hajri2, Pierre Breuer1, John Marshall3, Charlie Wellman4, Marco Vecoli2

*1EDDy Lab/Palaeopalynology, allée du VI Août, B-18, Sart Tilman, 4000 Liège, Belgium.p.steemans@ulg.ac.be*

*2Saudi Aramco, Dhahran, Saudi Arabia*

*3Ocean and Earth Science, University of Southampton, NOC, SO14 3ZH, Southampton, U.K.*

*4Department of Animal and Plant Sciences, University of Sheffield, Alfred Denny Building, Western Bank, S10 2TN, Sheffield, U.K.*

We present a review of Devonian palynology in Saudi Arabia based on the study of palynological samples from the subsurface of northern and central Saudi Arabia collected from the Tawil, Jauf and Jubah formations.

Saudi Arabian Devonian palynological assemblages are dominated by abundant, well preserved, and diverse miospores characterized by low thermal maturity (translucent yellow to brown in colour). Marine palynomorphs such as acritarchs and chitinozoans occur only rarely in these Devonian assemblages, and have not been studied taxonomically. Early Devonian (Lochkovian to Emsian) miospore assemblages are characterized by an abundance of endemic species; as a consequence, a regional biostratigraphic scheme applicable to Saudi Arabia has been developed. In the Middle and Upper Devonian, Saudi Arabian miospore assemblages become more and more dominated by cosmopolitan taxa, allowing close comparison with previously established zonations from the Old Red Sandstone continent.

The present miospore-based biostratigraphy shows that the upper half of the Tawil Formation is Lochkovian to early Pragian in age. The Jauf Formation spans an age from mid Pragian to late Emsian. The boundary between the Jauf and the Jubah formations is latest Emsian in age, while the top of the Jubah Formation extends beyond the Famennian, into the early Tournaisian (Early Carboniferous). These boundaries do not appear to be diachronous across the entire study area.

The taxonomic analysis of these abundant, diverse, and exceptionally well-preserved palynological assemblages also has enabled to gain insights into the biodiversity, palaeoenvironment, and palaeophytogeography of the Devonian vegetation of Saudi Arabia. For example, the observed breakdown of bioprovincialism may be attributed to a narrowing Rheic Ocean between Gondwana and Euramerica and/or to homogenization of climatic conditions. Interestingly, booms of leiospheres occur in association with flooding events in the Emsian (Jauf Formation), and can be used to track maximum flooding events in sequence stratigraphic studies.