

THE SURAT AND EROMANGA BASINS:
A PALYNOSTRATIGRAPHICAL PERSPECTIVE

M.E. Dettmann, J. Filatoff and P.L. Price

CSR Oil and Gas Division,
AMP Place,
10 Eagle Street,
BRISBANE, QLD. 4000

BIOGRAPHIES

Mary Dettmann is a graduate of the Universities of Melbourne and Canberra. Her research work has been centred on Australian Mesozoic and Cainozoic palynofloras, and she has undertaken applied palynological work for the petroleum industry. Currently she is working for CSR Oil and Gas Division on the Eromanga Basin Mesozoic.

John Filatoff obtained his B.Sc. (Hons.) from the University of Queensland and his Ph.D. from the University of Western Australia. Postgraduate research at the W.A. University was concerned with the Jurassic palynology of the Perth Basin. John has worked with the oil industry in Western Australia, Iran and Venezuela and has been involved in the study of palynological sequences ranging in age from Permian to Tertiary. He joined CSR Oil and Gas Division in 1981 as Senior Palynologist and has been involved primarily with palynological studies of the Surat Basin.

Peter Price graduated from the University of Sydney and was engaged initially in coal exploration within Queensland and N.S.W. He later joined AAR Ltd. as a palynologist working dominantly on the biostratigraphy of Queensland and South Australian Palaeozoic and Mesozoic sections.

SUMMARY

With the detailed exploration of the Eromanga Basin since 1978, it is perhaps timely to review the palynostratigraphy of the non-marine and near-shore marine Mesozoic section of eastern Australia. The last comprehensive review was that of Evans in 1966 although several studies of more localised geographical and stratigraphical extent have been published on parts of this section since then.

There has been little interest in developing a biostratigraphy for the early to mid Triassic "red-bed" and sandstone sequence beneath the Surat Basin (Rewan and Clematis Formations) or for the Nappamerri Formation underlying the Eromanga Basin. This is a reflection of the previously perceived poor petroleum prospectivity of these sediments.

Although the hydrocarbon potential of the mid Triassic of the Roma area is established (gas is produced from the Showgrounds Sandstone, and the Moolayember Formation has source potential) this section is generally thin and has not been subdivided palynologically.

Sediments of Late Triassic age are limited in their extent in eastern Australia. They are almost entirely absent from the Surat Basin region, and the eastern and central Eromanga Basin area. In the western Eromanga Basin region Late Triassic microfloras have been described in Leigh Creek and, more recently, have been identified overlying the Pedirka Basin sequence. The best known microfloras of Late Triassic age in eastern Australia are those of the Ipswich Coal Measures and basal Bundamba Group of the Clarence-Moreton region. Neither of these sections completely spans the late Middle Triassic to the earliest Jurassic and thus the microfloral succession of the Late Triassic in eastern Australia is incomplete.

The non-marine Jurassic sediments mark the beginning of *bona fide* Surat-Eromanga Basin sedimentation and to date have proved to be the most oil productive of the Australian onshore successions. The palynostratigraphy applied to this section is a modification of Evans' 1966 units. With the more extensive sample coverage now available, they have proved difficult to apply and further subdivide because of the vagaries of the interrelationship of facies and plant ecology.

The Early Cretaceous witnessed the onset of nearshore marine conditions in both the Surat and Eromanga Basins. The spore-pollen palynostratigraphy has proved to be more stable and consistent, suffering less from variation in plant geography. In the more marine sections (especially in the Eromanga Basin) the miospore zonation is complemented by a subdivision defined on phytoplankton (dinoflagellates and acritarchs).

The mid Cretaceous section (that above the Toolebuc Formation and its equivalents) has little representation in the Surat Basin, and has been subject to only limited palynological investigation in the Eromanga Basin.

Palynology still has a significant contribution to make in prospecting for hydrocarbons in the largely non-marine Mesozoic sequence of the Surat and Eromanga Basin regions by the detailed refinement and application of palynostratigraphy and palynofacies studies.