**Oligosphaeridium junctum** sp. nov. A Hauterivian dinoflagellate cyst from the North Sea

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**ABSTRACT** – The new species *Oligosphaeridium junctum* is described and illustrated from sidewall core samples in UKCS Well 15/29b-42. This species is considered to be an extremely useful stratigraphic marker in Hauterivian aged marine sediments of the North Sea. *J. Micropalaeontol*. 16(2): 159–162, October 1997.

**INTRODUCTION**

Well 15.29b-4Z was drilled by Conoco (UK) Limited in the South Viking Graben, UKCS North Sea, in 1989 (text Fig. 1). Rich and diverse dinoflagellate cyst assemblages were recovered from sidewall core samples shot through the Lower Cretaceous interval, including a new species, introduced here as *Oligosphaeridium junctum*. This form is restricted to Hauterivian deposits, and occurs in large numbers in Lower Hauterivian strata. The authors have also observed this species from numerous wells in the UK and Norwegian North Sea and it has previously been described informally, as *Oligosphaeridium* sp. 1 by Heilmann-Clausen (1987) from the Danish North Sea. As such, this is considered to be a very useful stratigraphic marker species.

**Material**

Standard palynological preparation techniques were used to produce strew mount slides of the horizons to be studied. All palynological slides examined are housed in the Palynological Collection of the Industrial Palynology Unit, Centre for Palynological Studies, Sheffield university, England.

**SYSTEMATIC PALYNOLOGY**

Division *Pyrrophyta* Pascher, 1914  
Class *Dinophyceae* Fritsch, 1929  
Order *Peridiniales* Haeckel, 1894  
Family *Gonyaulacaceae* Lindmann, 1928  
Genus *Oligosphaeridium* Davey & Williams, 1966 emend. Davey, 1982.

Type Species. *Oligosphaeridium complex* (White, 1842) Davey & Williams, 1966.

*Oligosphaeridium junctum* sp. nov.  
pl.1, figs 1–4; pl. 2, figs 1–4; text Fig. 2.

1987 *Oligosphaeridium* sp. 1, Heilmann-Clausen, p. 50, pl. 15, fig. 3.  

**Derivation of name.** Latin junctus, a connection; with reference to the distally linked processes of this species.

**Diagnosis.** Chorate gonyaulacoid cyst with a subspherical body and plate centred tubiform processes on the apical, precingular, postcingular and antapical paraplates. Endophragm and periphragm more or less smooth and closely appressed, except where the periphragm separates to form the processes. Processes expanded distally, with complex terminations, comprising elongated, flexuose spines which thin to thread-like trabeculae that often link adjacent processes. Apical archaeopyle, type (TA).

**Holotype.** Slide EH1(2). England finder reference E37. Plate 1, figs 1–3.

**Type locality.** Conoco Well 15/29b-4Z, 14636 feet (from RKB).

**Dimensions.** Inner body 43(52)61μm (12 specimens measured), overall diameter 78(91)104μm (12 specimens measured). Dimensions of holotype; inner body 48μm, overall diameter 96μm. Specimens measured from samples EH1 and EH2.

**Remarks.** The process formula corresponds to that of the type species *O. complex*. The distal trabecula are thin and irregular, sometimes branching and often connecting with adjacent processes. However, they are very delicate and prone to breakage and often do not interconnect. Distally, the main trunk of some of the larger processes may be deeply furcate (see text Fig. 2).
Explanation of Plate 1

**Fig. 1.** Oligosphaeridium junctum sp. nov. Holotype. Oblique apico-dorsal view in high focus. UKCS Well 15/29b-4Z, EH1(2), EF E37 (x650). **Figs 2-3.** Oligosphaeridium junctum sp. nov. Holotype. UKCS Well 15/29b-4Z, EH1(2), EF E37. Detail of distal trabecula (x1000). **Fig. 4.** Oligosphaeridium junctum sp. nov. UKCS Well 15/29b-4Z, EH1(1), EF R41/3. Detail of distal trabecula on a free operculum (x650).
Explanation of Plate 2

All specimens displaying both broken and unbroken distal trabecula. Fig. 1. Oligospheridium junctum sp. nov. UKCS Well 15/29b-4Z, EH2(2), EF P41/1. Fig. 2. Oligospheridium junctum sp. nov. UKCS Well 15/29b-4Z, EH2(2), EF D31. Fig. 3. Oligospheridium junctum sp. nov. UKCS Well 15/29b-4Z, EH2(1), EF N15. Fig. 4. Oligospheridium junctum sp. nov. UKCS Well 15/29b-4Z, EH2(1), EF T46/3. All figures ×650.
Compared with previous reports, O. junctum has been observed by the present authors in numerous North Sea wells. It has also been reported in many unpublished palynological reports by various biostratigraphic contractors and oil companies (usually under the informal name of *Oligosphaeridium 'amplexum*'). In all published and unpublished cases, this taxon is restricted to sediments of Hauterivian age and is a very widespread, often numerous and extremely useful stratigraphic marker species. However, to the authors' knowledge *O. junctum* has not been reported from outcrop material and so age interpretations are based on associated assemblages and stratigraphic relationship to previously published ranges of other dinoflagellate cysts. No information is available as to the relationship of *O. junctum* to other microfossil groups.

In the 15/29b-4Z well, dinoflagellate cysts associated within the overall range of *O. junctum*, include:

- *Coronifera oceanica*, *Oligosphaeridium perforatum*, *Phoberocysta neocomica*, *P. tabulata*, *Cassiculosphaeridia magna*, *Cteniodinium elegantulum*, *Spiniferites dentatus*, *Gonyaulacysta perforobusta*, *G. ordocava*, *Heslertonia pellucida*, *Cribroperidinium septimentum*, *Nelchinopsis kostromiensis*, *Sirmiodinium grossi*, *Endoscrinium campanulum*, *Muderongia simplex*, *Achomosphaera neptuni*, *Dingodinium albertii*, *Pseudoceratium pelliferum* and *Cymososphaeridium validum*.

Based on the above criteria it is possible to recognize three distinct biostratigraphic events within the overall range of *O. junctum*; range top: late Haueterivian, top acme event: intra-early Haueterivian, range base: intra early Haueterivian.

**REFERENCES**

Davy, R. J. 1982. Dinocyst stratigraphy of the latest Jurassic to Early Cretaceous of the Haldager No. 1 borehole, Denmark. *Danmarks Geologiske Undersogelse, Serie A;* 1-57.

Evitt, W. R. 1985. *Sporopollenin Dinoflagellate Cysts: Their Morphology and Interpretation.* AASP Foundation, Austin, Texas, 1-333.

Glennie, K. W. (Ed.) 1986. *Introduction to the Petroleum Geology of the North Sea.* Blackwell, Oxford, 1-278.

Heilmann-Clausen, C. 1987. *Lower Cretaceous dinoflagellate biostratigraphy in the Danish Central Trough.* *Danmarks Geologiske Undersøgelse, Serie A;* 17:173-300.

Lentin, J. K. & Williams, G. L. 1987. *Fossil dinoflagellates: index to genera and species,* 1989 Edition. *AASP Contributions Services,* 20:1-473.

Stover, L. E. & Evitt, W. R. 1978. *Analyses of Pre-Pleistocene organic walled dinoflagellates,* *Stanford University Publication, Geological Science,* 18:1-243.