A Middle Cambrian age for the Ediacara-type fauna from the Booley Bay Formation, County Wexford, Ireland: new acritarch data and their implications.

[Un âge Cambrien moyen pour la faune de type Ediacara de la Formation Booley Bay, Comté de Wexford, Irlande : nouvelles données sur les acritarches et leurs implications]

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Key Words: Acritarchs; biochronology; Ediacara; Booley Bay Formation; Ireland; Middle Cambrian

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Mots-Clefs : Acritarches ; biochronologie ; Ediacara ; Formation de Booley Bay ; Irlande ; Cambrien moyen

Ten years ago a well-preserved Ediacara-type fauna was recorded for the first time in sediments at the type section of the Lower Palaeozoic Booley Bay Formation in County Wexford, Ireland (CRIMES *et alii*, 1995). Four microfossil samples were collected from mudstones intercalated in sandstone beds. These yielded an acritarch fauna that (MOCZYDLOWSKA & CRIMES, 1995) considered to indicate a late Late Cambrian age for the Ediacara-type fauna. They proposed that this find extended the known stratigraphic range of Ediacara-type fauna from the Neoproterozoic to the Late Cambrian, rather than to the Middle Cambrian as had been indicated previously (CONWAY MORRIS, 1993).

The current study examines these microfossils in great detail, with eighteen more samples collected, all of which were productive. One additional sandstone bed with an Ediacara-type fauna approximately 100m above those recorded earlier was also found. The exceptionally well-preserved acritarch assemblages in contiguous mudstones indicate unequivocally a Middle Cambrian age for the uppermost bed with an Ediacara-type fauna, thus confirming that the range of this biocoenose is restricted to the Middle Cambrian. Consequently, the late Late Cambrian age suggested by MOCZYDLOWSKA & CRIMES (1995) must be rejected.

Four lines of argument are developed in support of this rejection:

1. The identification by these authors of so-called Upper Cambrian-Lower Ordovician acritarch markers is questioned or rejected as (a) probably an artifact (*Aryballamorpha albertana*), (b) possibly technical contamination (*Trichosphaeridium hirtum*), (c) misidentifications (*Cristallinium randomense* and *Polygonium martinae*), (d) meaningless short spined acanthomorphs (*Heliosphaeridium* sp. B) or (e) an unfigured species (*Stellechinatum uncinatum*). The ranges of all of the other taxa they recorded include the Middle Cambrian;
2. Most of the studied samples exhibit the same characteristic assemblage dominated by *Cristallinium cambriense*, *Eliasum llaniscum* and *Timofeevia lancarae*. This assemblage does not at all resemble late Late Cambrian acritarch associations known elswhere where diacromorphitae, oomorphitae and galeate forms are generally abundant;
3. Species such as *Abacum normale*, *Adara alea*, *Eliasum asturicum*, *Eliasum* ? *hutchinsonii*, *Eliasum llaniscum*, *Vulcanisphaera lanugo* indicate a Middle Cambrian age and validate a correlation with Newfoundland mid or mid-late Middle Cambrian acritarch zones (MARTIN & DEAN, 1988);
4. The uppermost sample of the sequence studied, sited well above the highest beds containing an Ediacara-type fauna, yielded a completely discrete acritarch assemblage comprising amongst others

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Cymatiogalea virgulta, *Timofeevia pentagonalis* and *Vulcanisphaera turbata* of early to mid Late Cambrian age.

This re-enforces the fact that the underlying Ediacara-type faunas and the 17 acritarch-bearing horizons associated with them are confined strictly to the Middle Cambrian.

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