PALAIOSPHAERIDIUM, A NEW ACRITARCH GENUS FROM THE TREMADOC OF ENGLAND

by

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Summary

A new acritarch genus, *Palaiosphaeridium* gen. nov. is recorded from the Shineton Shales of the Wrekin district, Shropshire, England, where it occurs throughout the Tremadoc succession. The genus is represented by the two new species, *P. kamax* sp. nov. (type species) and *P. mikram* sp. nov.

Introduction

The present investigation is based on fifty-two samples collected from Tremadoc rocks exposed in the Wrekin district of Shropshire, England, where the representative formation is the Shineton Shales. A detailed geological account of this area was given by Stubblefield and Bulman (1927). The type area of the Tremadoc Series exposed in North Wales is highly metamorphosed and consequently unsuitable for acritarch study. However, the stratal equivalents of the Tremadoc Slates of North Wales are well represented in the Wrekin district and are largely undeformed. The general succession of the Shineton Shales and the macrofossil contents of individual beds are as follows:

General succession	Macrofossils
Arenaceous Beds	*Lingulella nicholsoni* and *Acrotreta sabrinae*
Shumardia Pusilla Beds	*Shumardia pusilla*. *Agnostos calvas* var. *latemarginalis*, *A. callavei* and *A. dux*. *Euloma monile*, *Parabolina triarthra*, *Asaphellus homfrayi*, etc.
Brachiopod Beds	*Obolus quadratus*, *Lingulella nicholsoni*, etc.
Clonograptus Tenellus Beds	*Clonograptus tenellus*, *C. tenellus* var. *callavei*, *Leptoplastus salteri*, *Broggeria salteri*, etc.
Transition Beds	*Clonograptus tenellus* and *C. tenellus* var. *callavei* *Shumardia curta*, *Dictyonema flabelliforme*, etc.
Dictyonema Flabelliforme Beds	*Dictyonema flabelliforme*, *Acrotreta nicholsoni*, *Bellerophon*, etc.

In general, the highest beds of the Shineton Shales tend to be arenaceous with decline of acritarch species but with this exception, the thick mass of shales is homogeneous in character and rich in acritarchs. The rocks are usually bluish-grey in colour but occasionally weathered to olive-green. For an outline account of the acritarchs, *Mercian Geologist* readers are referred to Sarjeant (1967), and to Downie (1973).

In general, assemblages of acritarchs observed in the Shineton Shales are in excellent state of preservation (Rasul, 1974). Downie (1958) calculated that about 100,000 individuals are

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present in each gram of rock from the *Shumardia Pusilla* Beds. The present author has discovered some new forms of acritarchs which are assigned to two species of a new genus, *Palaiosphaeridium*. All type specimens described in this paper are in the collections of the micropalaeontology laboratory, Department of Geology, University of Sheffield.

Systematic description

Group ACRITARCHA Evitt, 1963
Subgroup ACANTHOMORPHITAE Downie, Evitt and Sarjeant 1963
Genus *Palaiosphaeridium* gen. nov.
Plate 5, figs. 1-3.

Derivation of name: Greek, *palaios*, ancient and Greek, *sphaira*, ball.

Diagnosis: Body spherical, single walled, thin, smooth; wall ornamented with distinct, hollow, cylindrical processes, variable in length and width and nature of the tips; the tips are usually round, sometimes flat, rarely pointed; tips of a few processes are occasionally forked. The inner space of the processes communicates with the body cavity.

Type species: *Palaiosphaeridium kamax* sp. nov., Brachiopod Beds, Tremadocian, Wrekin district, Shropshire, England, described below.

Remarks: The genus which most closely resembles *Palaiosphaeridium* is *Archaeohystrichosphaeridium* (Timofeyev 1959), but the new genus is distinguishable from the latter by its typical cylindrical processes. Timofeyev included many dissimilar forms in *Archaeohystrichosphaeridium* and no type species was designated for the genus. It is therefore invalid according to the International Code of Botanical Nomenclature. Leoblich and Tappan (1976) chose a type species making *Archaeohystrichosphaeridium* a junior synonym of *Cymatiogalea* Deunff 1961. *Baltisphaeridium* (Eisenack) Eisenack 1969 differs from *Palaiosphaeridium* gen. nov. in having processes not communicating with the body cavity and possessing a larger size range of central body.

Palaiosphaeridium kamax sp. nov.

Plate 5, figs. 1 and 2.

Derivation of name: Greek, *kamax*, pole, post, shaft.

Diagnosis: Body spherical, may appear ellipsoidal on being collapsed; wall is thin, smooth; processes are numerous, hollow, cylindrical, pillar like; tips are usually rounded, rarely angular or forked; sometimes they are flat; the processes are quite variable in width.

Holotype: Slide ref.: B12/1-267.1187, Brachiopod Beds, Tremadocian, Wrekin district, Shropshire, England. (Grid Ref.: SJ 589038).

Dimensions: Body diameter 21 (min). - 44 μm (max).; length of processes 11 - 45% of body diameter; width of processes 1.5 - 9.5 μm; number of processes in optical section 9 - 20.

Holotype: Body diameter 25.5 μm; length of processes 11 - 24% of body diameter; number of processes in optical section 11.

Remarks: Specimens of this species shows great variability in width of their processes.

Palaiosphaeridium mikrum sp. nov.

Plate 5, fig. 3

Derivation of name: Greek, *mikras*, small, little, referring to smaller size of the test.

Diagnosis: Body spherical, small, smooth and thin walled; processes are hollow, cylindrical; their tips are rounded or sometimes pointed.

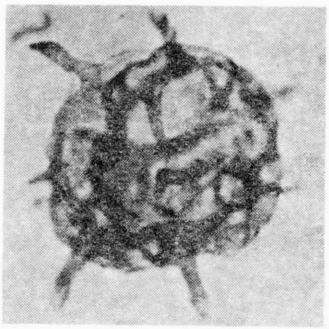

Fig. 1. *Palaiosphaeridium kamax* sp. nov (holotype) × 1250. Slide ref.: B12/-267.1187.

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March 1977

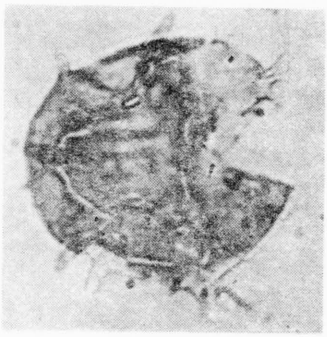

Fig. 2. Another specimen of *P. kamax* showing a partial equatorial split. × 1250. Slide ref. B 14/1 - 572.138.

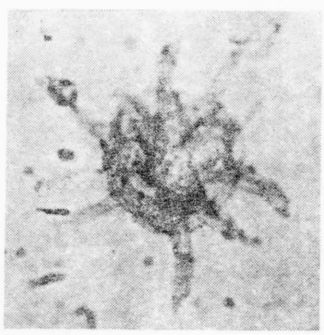

Fig. 3. *P. mikram* sp. nov. × 1250 (holotype). Slide ref.: B3/1 - 49.1279.

Holotype: Slide ref.: B3/1-49.1279, Brachiopod Beds, Tremadocian, Wrekin district, Shropshire, England.

Dimensions: Body diameter 11 (min) - 16 μm (max); length of processes about 25-60% of body diameter; number of processes in optical section 7-15.

Holotype: Body diameter 16 μm; length of processes about 50% of body diameter; number of processes in optical section 15.

Remarks: *Palaiosphaeridium mikram* sp. nov. can be distinguished from *P. kamax* by its smaller size. Although this species comes within the size range of genus *Micrhystridium* Deflandre, it is more closely related to the genus *Palaiosphaeridium* in respect of its cylindrical processes.

Acknowledgements

The present investigation, a part of doctoral thesis, was carried out at the University of Sheffield under the supervision of Processor C. Downie.

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