

# CYCLAGELOSPHAERA WIEDMANNII NEW SPECIES, A MARKER FOR THE CALLOVIAN

Viviana Reale and Simonetta Monechi, Dipartimento di Scienze della Terra Via La Pira 4, 50121 Firenze, Italy.

During a biostratigraphic study of Middle-Upper Jurassic calcareous nannofossils, several circular placoliths with a circular central area were observed. These placoliths are similar to *Cyclagelosphaera deflandrei* (Manivit, 1966) Roth 1973 in shield structure and optical properties, but are not as large, and have a different stratigraphic range (Callovian). Because of the different stratigraphic range and morphological features it is described here as a new species: *Cyclagelosphaera wiedmannii*.

Moshkovitz & Ehrlich (1987) in a short note summarize and elucidate the taxonomic problems and distribution of *Watznaueria manivittae* Bukry 1973; they define a neotype for *W. manivittae* and describe it as an elliptical to sub-elliptical placolith with an elliptical or sub-elliptical central area. In the light microscope, between crossed nicols, the species is easily recognized by its high birefringence colours. Large high birefringence circular placoliths with a circular central area are instead referred to *C. deflandrei*. Unfortunately, due to systematic confusion, the stratigraphic ranges of these forms is not well known; Moshkovitz and Ehrlich (1987) suggested from literature data and their observations a range from Callovian to Berrasian for *W. manivittae* and ?Kimmeridgian/Tithonian - upwards for *C. deflandrei*. Recent biostratigraphic studies in France and Italy show that the FO of *W. manivittae* is older than Callovian: this event has been recognized in the Lower Bajocian in the Digne area (Erba 1990) and in the Aalenian in the Umbria Marche Basin (Reale *et al.* 1992). The last occurrence of *W. manivittae* is still uncertain.

During the examination of DSDP Hole 534A (Blake-Bahamas Basin), we found in the lower samples circular placoliths with circular central areas and high birefringence colours, that could be related to *C. deflandrei*. However, these placoliths have a smaller size (8-9 µm) compared with the original description of Manivit (1966); total diameter 12 µm; diameter of proximal shield 10 µm. Also they have a restricted stratigraphic range, being confined to the Callovian. The different morphological features and the different stratigraphic range has allowed us to define the new species *C. wiedmannii*.

In order to constrain the stratigraphic range, well-dated ammonite samples have been investigated. In the Quissac section, SE France (Bouder *et al.*, 1993), the FO was found at the base of the *macrocephalus* Zone in the Lower Callovian.

The first occurrence of *C. wiedmannii* has been also recognized in the lower part of DSDP Hole 534A (127-2, 30-31 cm). This event allows us to assign an Early Callovian age to the base of the Hole 534A, an older age than previously reported by Roth (1983). The LO was recognized at DSDP Hole 534A just before the FO of *Stephanolithon bigotii maximum*, an event calibrated to the Upper Callovian by Bown *et al.* (1988) and Gardin, (1993 *pers. comm.*).

The FO and LO of *C. wiedmannii* have been also found in other sections: in the Bihendula section, Somalia (Monechi & Reale, in prep.) and in the Valdorbis section, Italy. The stratigraphic range of *C. wiedmannii* is quite distinctive; because of its resistance to dissolution, it can be recognized in unfavourable lithologies, where delicate specimens are not preserved.

In our work we have also given attention to the stratigraphic range of *C. deflandrei* in order to characterize its first occurrence. The preliminary results (Monechi & Reale in prep.) show the presence of few specimens in the Tithonian of Valdorbis and DSDP Site 105.

## Systematic taxonomy

*Cyclagelosphaera wiedmannii* sp. nov.

Pl. I Figs. 1-18

**Diagnosis:** A large (8-9 µm) circular, concavo-convex bi-shield placolith with a small circular central area

**Description:** A circular placolith with a rim composed of two shields: a bicyclic distal shield and a monocyclic proximal shield. The outer cycle of the distal shield is the broadest of the two and is composed of 32 sub-rectangular elements joined along counterclockwise inclined sutures. The inner cycle is composed of elements joined along near-radial sutures and surrounds a small circular central perforation sometimes closed by calcite crystals. In the light microscope, between crossed nicols, this species is easily recognized by its high birefringence.

**Size:** Diameter 8-9 µm.

**Differentiation:** *C. wiedmannii* is distinguished from *C. deflandrei* by its smaller size, from *C. margerelii* (Noel 1965) by its high birefringence colours and from *C. argoensis* Bown (1992) by the lack of the third inner wall cycle in the distal shields.

**Derivation of name:** In honour of Prof. Jost Wiedmann

**Holotype:** 204/91 (Pl. I Fig. 1) IGF 2912P: figures refer to film/frame number, they are stored in the Geological and Palaeontological Museum of the University of Florence.

**Isotypes:** 510/91, 220/24, 25, 506/91, 220/18, 19 (Pl. I Figs. 2, 3, 4, 7, 8, 9, 10).

**Type locality:** DSDP Hole 534A, Blake Bahamas Basin, NW Atlantic Ocean.

**Type level:** 534A-25-3, 50-51 cm; Callovian.

**Occurrence:** DSDP Site 534A (NW Atlantic), Valdorbis

section (Italy), Quissac section (SE France), Bihendula section (Somalia).

**Range:** Callovian.

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Species	Author	Type size	Type age	Other features	Age range	Size Range
<i>C. magerelii</i>	Noel 1965	3.1 µm	Oxfordian		Baj-Maas	<?8 µm
<i>C. argoensis</i>	Bown 1992	8.8 µm	Tithonian	broad inner cycle	Tith-Val	6-11.5 µm
<i>C. deflandrei</i>	(Manivit 1966) Roth 1973	12 µm	Valanginian		Tith-Haut	>?9 µm
<i>C. wiedmannii</i>	Reale & Monechi 1994	9 µm	Callovian		Callovian	8-9 µm
<i>W. manivatae</i>	Bukry 1973	13 µm	"U. Jurassic"	(sub)-elliptical	Aal-Berr	>9 µm

Tabular Summary of *Cyclagelosphaera* species

#### PLATE 1

All Light Microscope figures at 2800X

All SEM Microscope figures at 4850 X

**Figs. 1-18:** *Cyclagelosphaera wiedmannii* sp. nov. 1. Holotype SEM distal view 204/91 IGF 2912P; sample DSDP 534A-125-3, 50-51cm. 2, 7-8. (2) Isotype SEM distal view 510/91; (7-8) LM cross-polarized (Xp) and bright-field (Bf) 220/24-25; sample 534A-125-3, 50-51cm. 3, 9-10. (3) Isotype SEM distal view, 506/91; (9-10) LM Xp and Bf, 220/18-19, sample DSDP 534A-125-3, 50-51cm. 4. Isotype SEM distal view 208/91, sample DSDP 534A-125-3, 50-51cm. 5. SEM distal view 310/91, sample DSDP 534A-125-6, 84-85cm. 6. SEM distal view 410/91, sample DSDP 534A-125-6, 84-85cm. 11-12. LM Xp and Bf, 220/10-11, sample DSDP 534A-125-6, 84-85cm. 13-14. LM Xp and Bf 220/4-5, Bihendula section sample F13. 15-16. LM Xp and Bf, 220/8-9, Bihendula section sample G1. 17-18. LM Xp and Bf, 218/24-25, Valdorbia section sample CV74.



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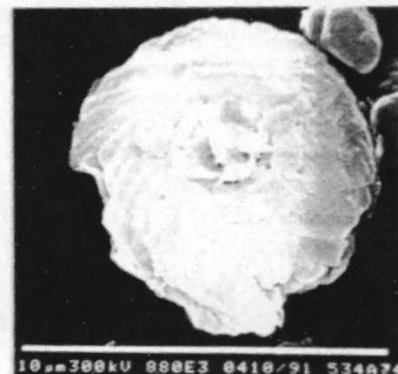
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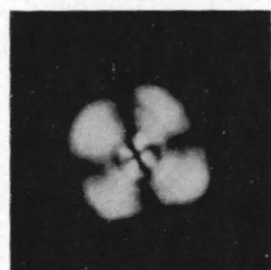
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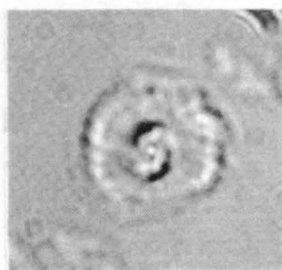
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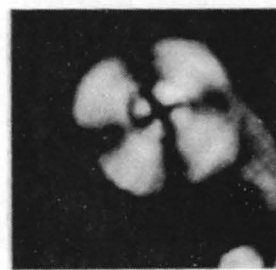
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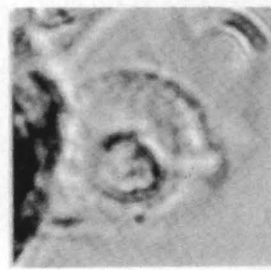
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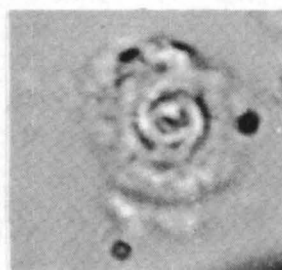
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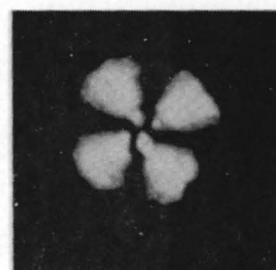
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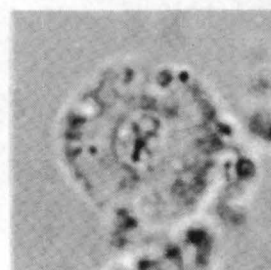
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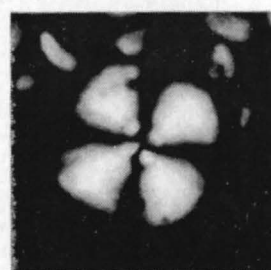
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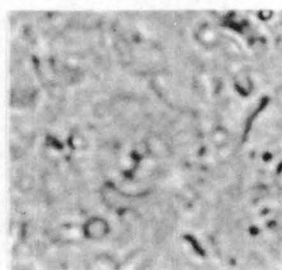
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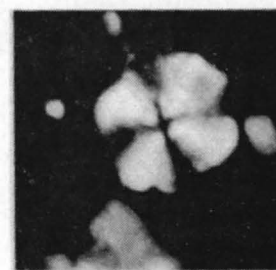
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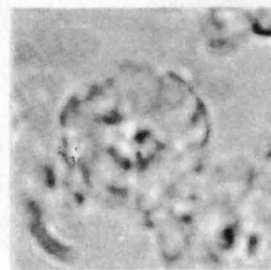
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