

Taxonomic note: *Watznaueria okadai*, a new species of calcareous nannofossil from the Vocontian Basin, southeastern France

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Abstract: A new species of *Watznaueria*, *W. okadai*, is described from the Goguel Level of the Les Sauzeries section in southeastern France (Vocontian Basin). The species occurs in Nannofossil Zones NC6A-NC7A (Early Aptian) and is presently known only from the study area.

Keywords: *Watznaueria okadai*, Aptian, Goguel Level, Vocontian Basin, southeastern France

Introduction

A calcareous nannofossil biostratigraphic study of the Goguel Level in the Vocontian Basin, southeastern (SE) France revealed a new species of *Watznaueria*, which is described herein. The samples were collected from the Goguel Level ('Niveau Goguel') of Core 2003-GOG-1, drilled in Les Sauzeries in the southern part of the Vocontian Basin (Figure 1A). The material was collected in connection with the 21st Century Center of Excellence Program "The Neoscience of Natural History" of Hokkaido University.

The Goguel Level is a regional equivalent of the globally-distributed Oceanic Anoxic Event 1a (OAE1a), and is represented in the core by a ~6.2m-long interval between the Bedoulian Limestone (Core 17-4) and an overlying marl (lower 30cm of Core 15-3; Figure 1B). The interval is composed of alternating sequences of strongly- to weakly-bioturbated, non-laminated to well-laminated, light to dark grey mudstones, siltstones and marls. These alternations are punctuated by several black shale intervals, labeled GO1-GO6 on Figure 1B. The new species was recorded in Core 16-1, in the GO6-I shale. The investigated interval was assigned by Fernando (2006) to NC6A-NC7A (of Roth, 1978; Bralower *et al.*, 1993, 1995), equivalent to CC7a (of Perch-Nielsen, 1985, modified from Sissingh, 1977). These zones suggest an Early Aptian age, which is more or less consistent with the widely accepted age of OAE1a (e.g., Bralower *et al.* 1994).

Taxonomy

The cores used in the present study are stored at Hokkaido University (Sapporo, Japan) and IFREE, JAMSTEC (Yokusaka, Japan). Smear slides and original digital images of the new species

are stored at the Nannoworks Laboratory of the National Institute of Geological Sciences, University of the Philippines (Quezon City, Philippines).

Order **WATZNAUERIALES** Bown, 1987

Family **WATZNAUERIACEAE**

Rood, Hay & Barnard, 1971

Genus *Watznaueria* Reinhardt, 1964

***Watznaueria okadai* sp. nov.**

Plate 1, Figures 6-8

Derivation of name: Named after Prof. Hisatake Okada (Hokkaido University, Sapporo, Japan), noted nannofossil palaeontologist and biostratigrapher. **Diagnosis:** Medium-sized, broadly-elliptical placolith coccolith (axial ratio ~1.1), with a sub-axial, asymmetrical cross occupying the central area. The short-axis arms are short and straight, whilst the long-axis bar is sigmoidal. **Remarks:** This species was originally illustrated in Fernando (2006) as *Watznaueria* sp. A (Pl. 18, figs 18-20). *W. okadai* is different from *W. quadriradiata* and *W. bybelliae*, both

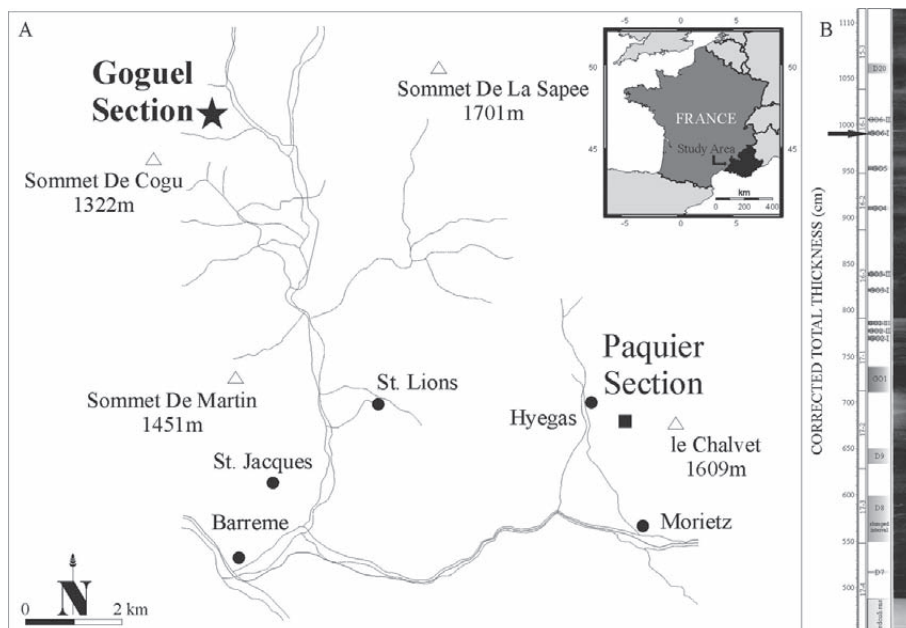


Figure 1 (A) Location of the Les Sauzeries section (Goguel core) in the Vocontian Basin, SE France. (B) Composite image of the cores drilled in the study area showing the black shale level, labeled GO6-I (indicated by arrow) wherein the new species was observed.

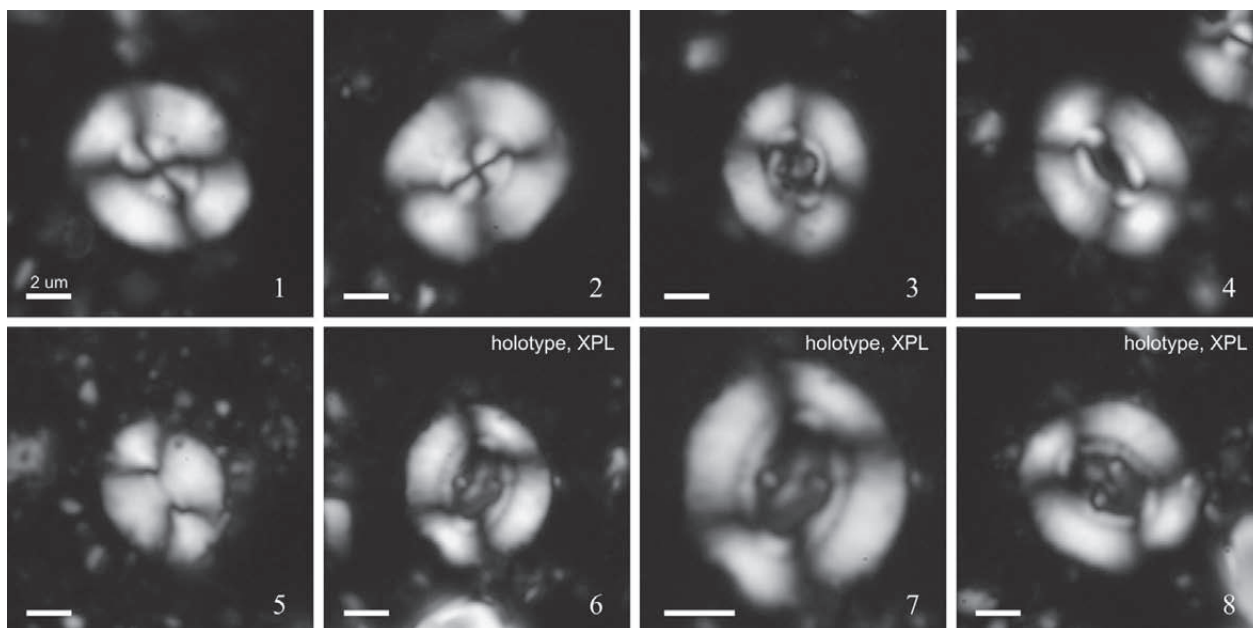


Plate 1 *Watznaueria* species from the Goguel core (all images taken in cross-polarised light - XPL). **1-2.** *W. barnesiae*, GO-029 (1), 15-3 no. 16 (2); **3.** *W. britannica*, 15-3 no. 16; **4.** *W. fossacincta*, 16-1 no. 15; **5.** *Watznaueria* sp., GO-027; **6-8.** *Watznaueria okadai* sp. nov. (holotype), 16-1 no. 15.

Watznauerias with a central-area cross, in several aspects. The central areas of *W. quadriradiata* and *W. bybelliae* are spanned by axial crosses with straight bars, whilst *W. okadai* has a subaxial, asymmetrical cross. The geological ranges of the taxa are also different: *W. okadai* is, at present, only known from the Early Aptian, while *W. quadriradiata* and *W. bybelliae* are known from the Santonian to Maastrichtian (e.g. Burnett *et al.*, 1998; Self Trail, 1999). **Dimensions:** Length = 7 μm; width = 6.5 μm. **Holotype:** Pl.1, figs 6-8. **Type locality:** Les Sauzeries section, Vocontian Basin, SE France. **Type level:** Sample 16-1 no. 15, Core 16-I, GO6-I shale interval, Goguel Level (Lower Aptian). **Occurrence:** NC6A-NC7A in the Les Sauzeries section, Vocontian Basin, SE France (Fernando, 2006). The species was recorded as rare in occurrence.

Acknowledgements

AGSF would like to thank Drs Hisatake Okada, Ken Sawada and Reishi Takashima (Hokkaido University) and Dr. Koichi Iijima (IFREE, JAMSTEC) for collecting the samples. The paper is an offshoot of AGSF's PhD Dissertation at the Division of Earth and Planetary Science, Graduate School of Science, Hokkaido University, Sapporo, Japan.

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