

A NEW SIDEROLITID FROM THE LATE MAASTRICHIAN OF ITALY

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ABSTRACT

During the latest Cretaceous, many representatives of the larger benthic foraminifera (LBF) community reached a high level of “maturation”, developing large-sized shells with complex architectures. Increasing size and complexity in a relatively short period of time can be interpreted as a rapid response to biologic competition for space and resources with other LBF (like for instance fabularids, lacazinids, alveolinids, rotaliids, orbitoidids) in the shallow carbonate to mixed carbonate-clastic platforms.

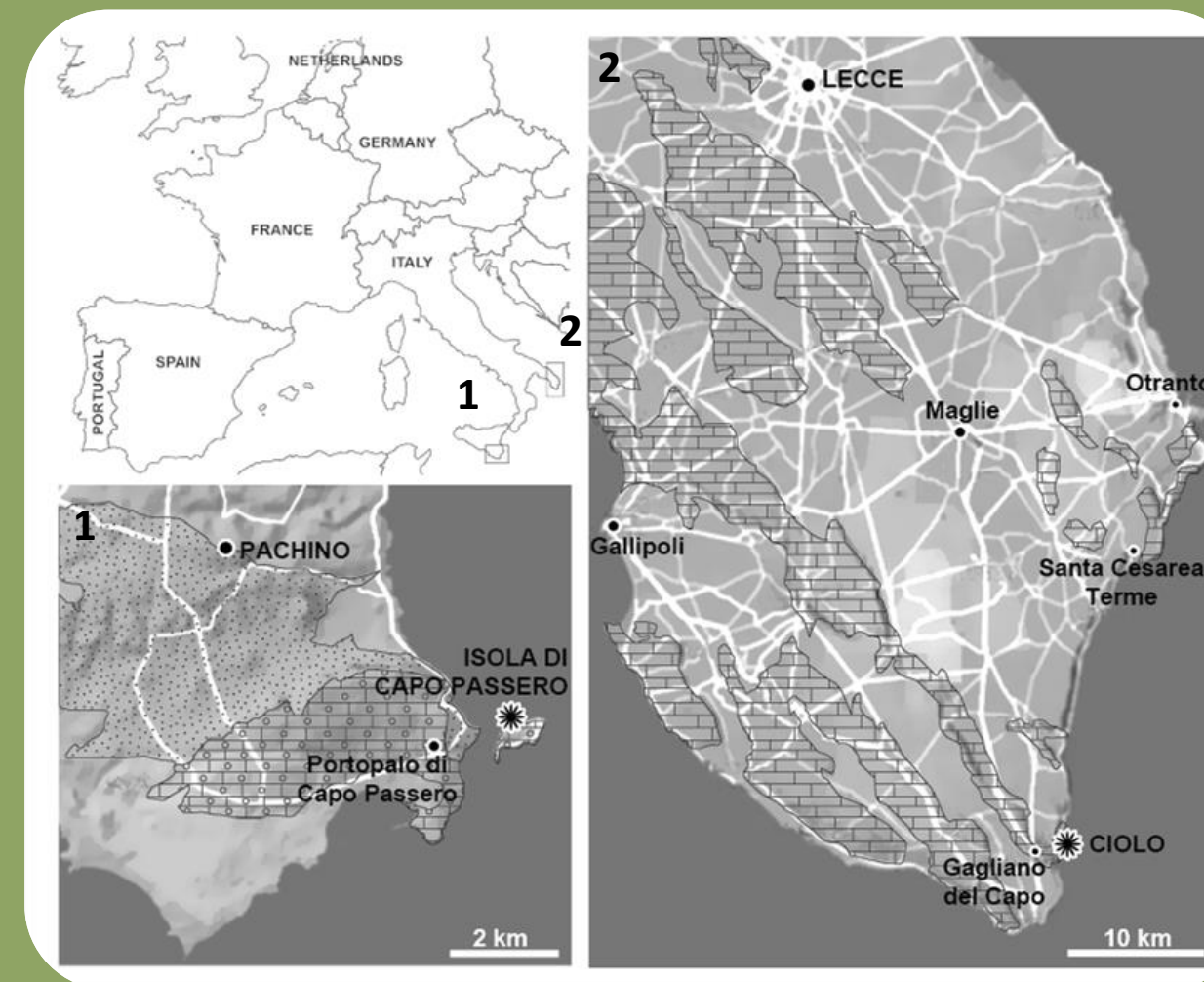
A paradigm of this type of fast evolution is the group of the Siderolitidae, lamellar-perforate LBF with a complex canal system that were abundant in shallow-water platforms during the late Cretaceous (Campanian-Maastrichtian). Five genera have been described up to now that represent five different steps of evolution in terms of complexity: *Arnaudiella*, *Praesiderolites*, *Pseudosiderolites*, *Wannierina* and *Siderolites*. In broad terms, the species ascribed to these genera replace each other in time, offering a good tool for high resolution biostratigraphy. Recent studies on material from the late Maastrichtian of Italy have yielded a siderolitid with a singular architectural pattern that differs from its relatives. The new morphotype has a very large test with large canaliferous spines and a very complex enveloping canal system. This new morphotype is the youngest siderolitid known so far. Strontium isotope stratigraphy indicates a late Maastrichtian age of 66.4 ± 1.5 Ma, very close to the K-Pg boundary. The large size and very high complexity shown by the new morphotype are in accordance with the general evolutionary trends of LBF.

GEOLOGICAL AND STRATIGRAPHICAL SETTING

The material studied from the Salento Peninsula was sampled in the type locality of the lithostratigraphic unit called Ciolo Limestone, il Ciole Cove (Parente, 1994). This unit consists of 50 m of alternating floatstone-rudstone and grainstone rocks with rudists debris, red and dasycladaceans algae and larger foraminifera.

The studied samples from the Sicily Island were collected in Capo Passero Island in the lithostratigraphic unit of Portopalo Limestone of Maastrichtian age (Colacicchi, 1963).

The new genus is associated to other larger benthic foraminifera such as *Omphalocyclus macroporus*, *Orbitoides gensacicus*, *Orbitoides sp.*, *Hellenocyclina beutica?*, *Lepidorbitoides socialis*, *Sirtina ornata* and *Solenomeris ogormani*.

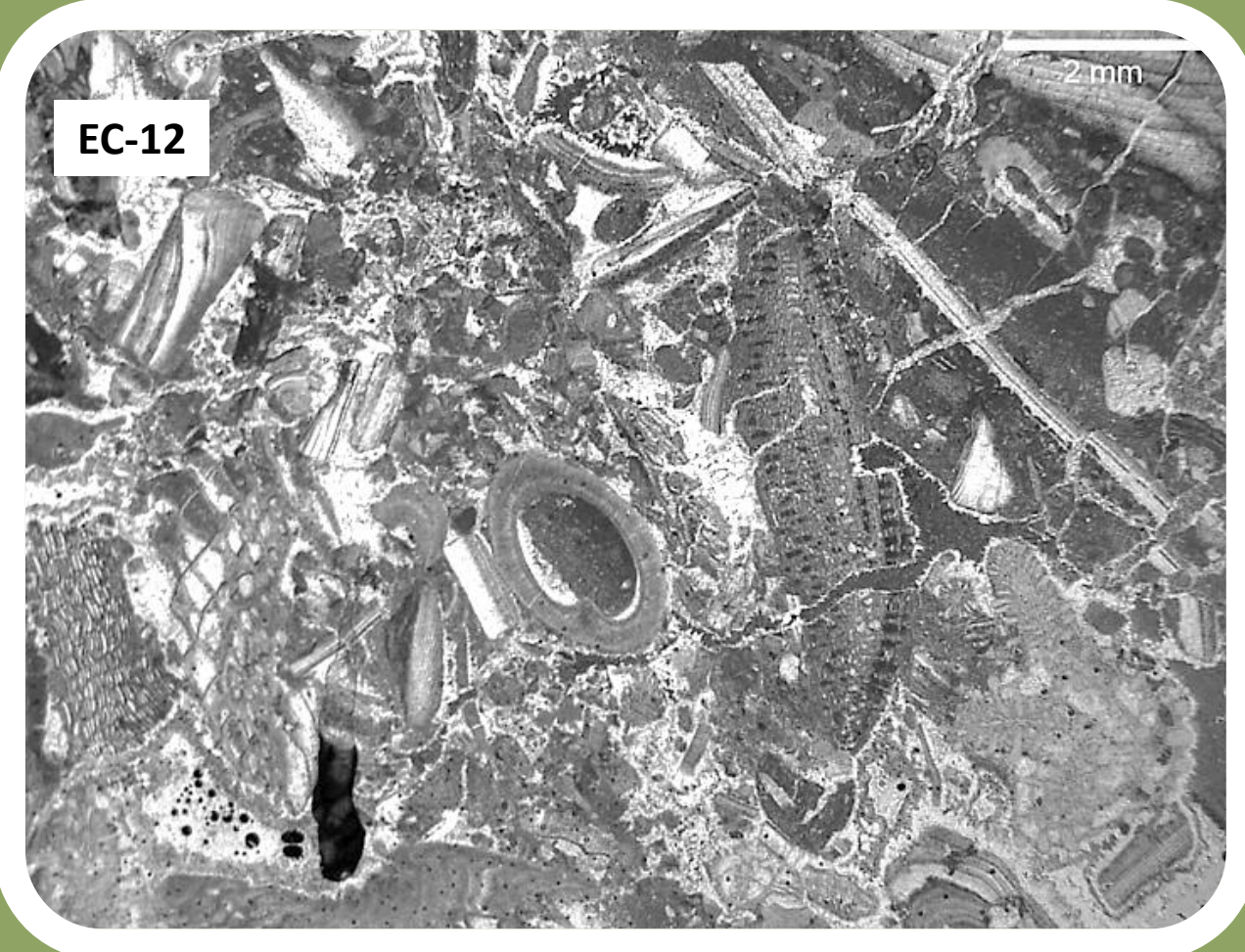
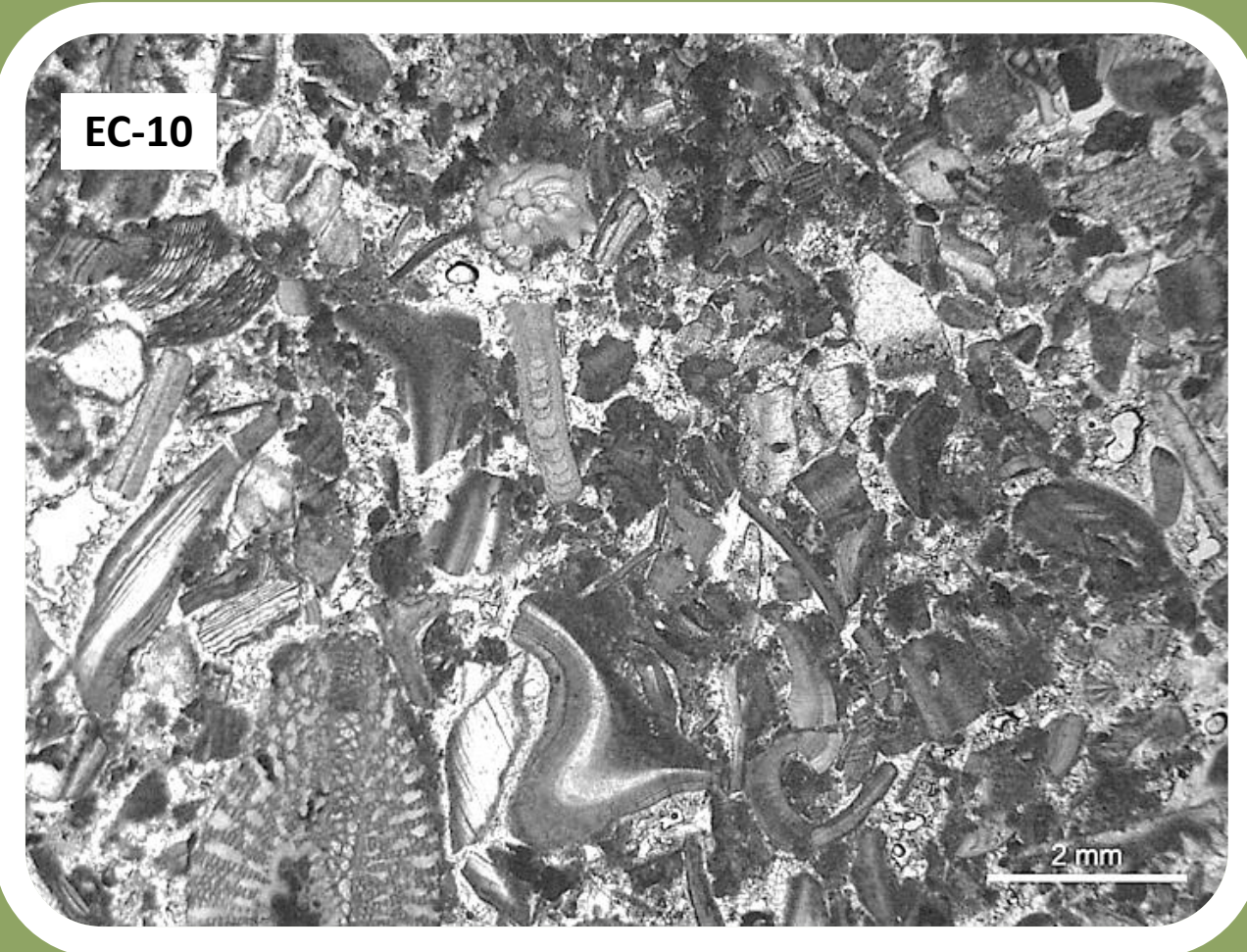
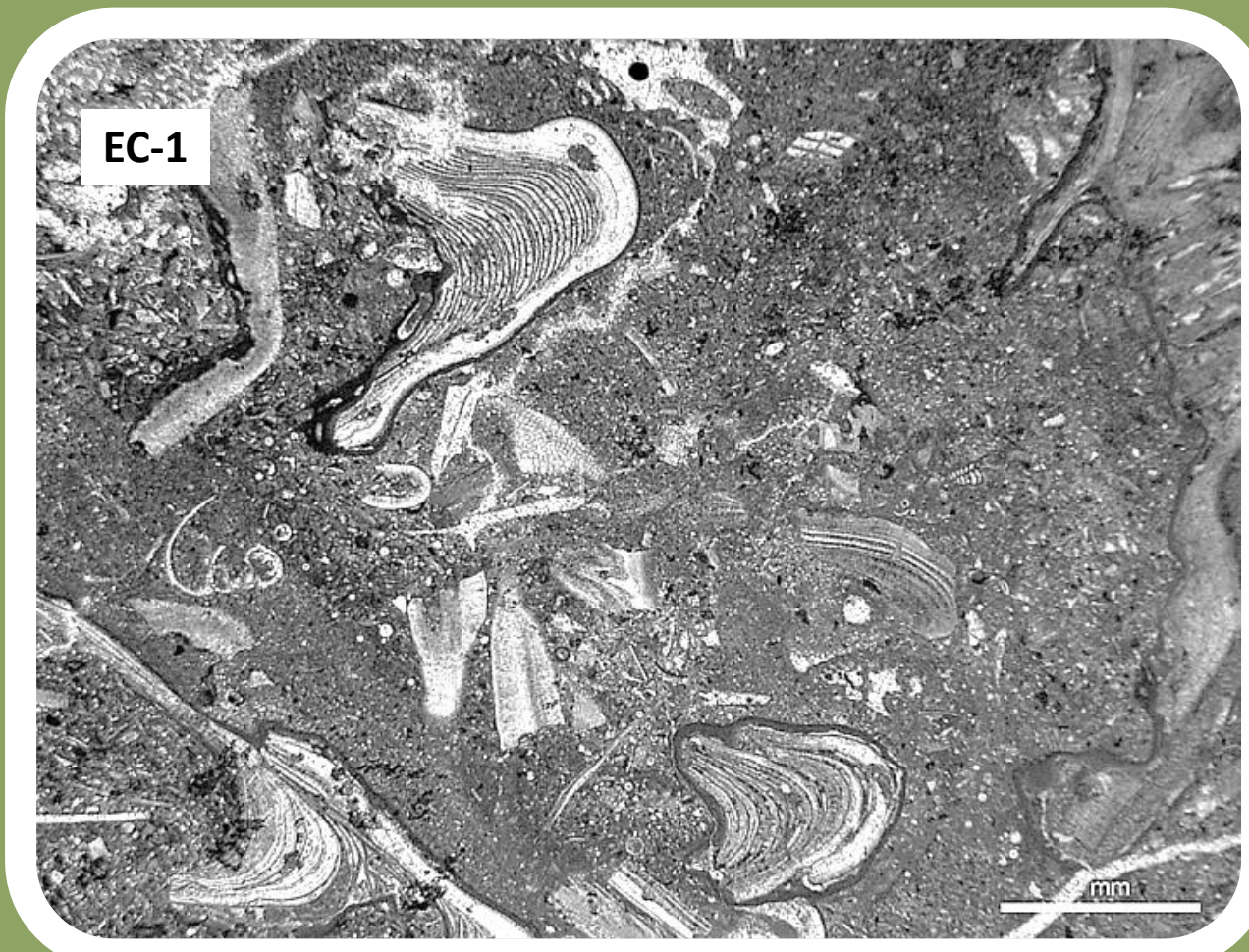


Geographical location of the studied outcrops: (1) *Capo Passero* and (2) *Il Ciole*. Note the distribution of the upper Cretaceous limestone in the detailed schematic location.

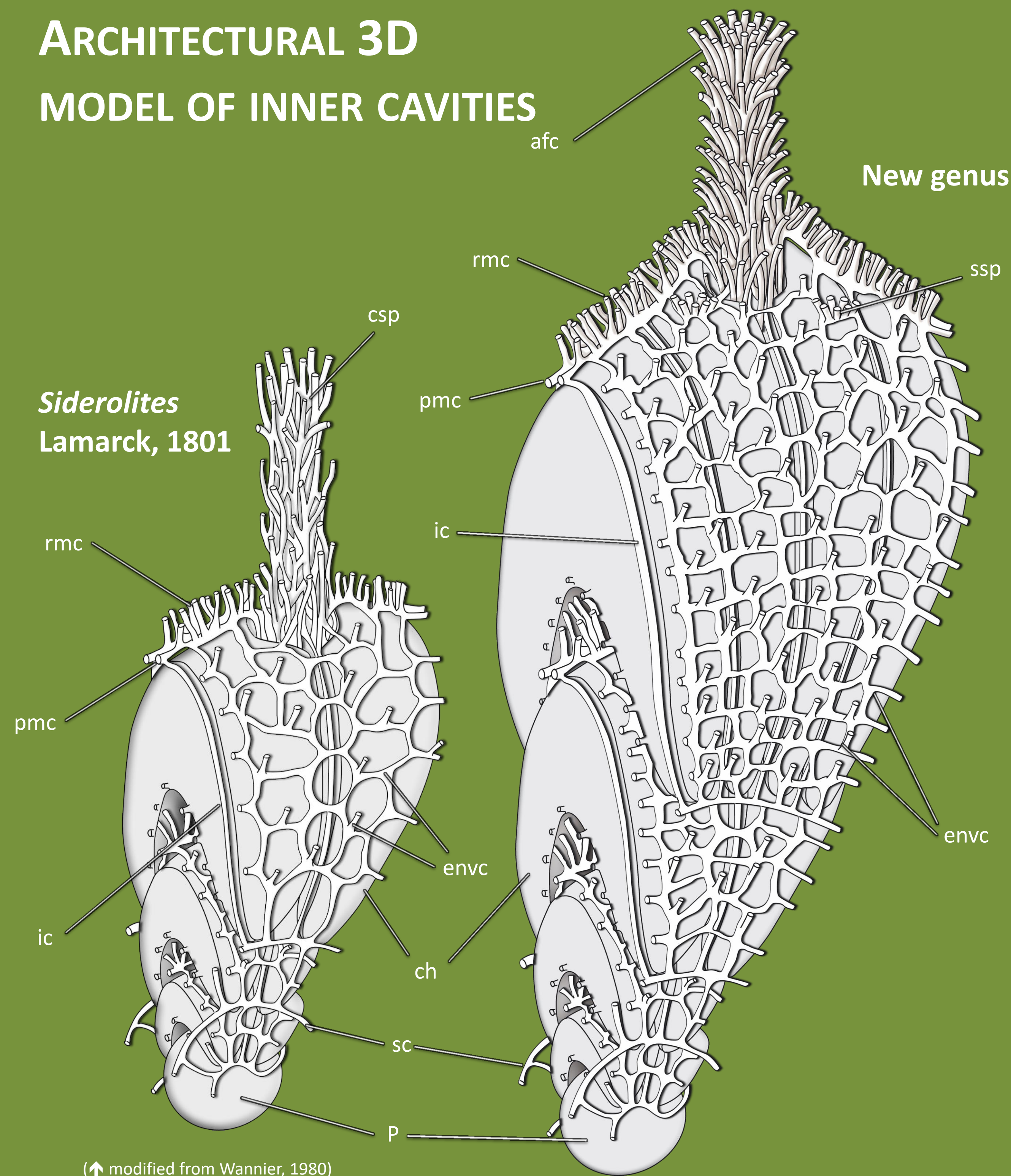
Stratigraphic section in *Il Ciole*, Salento Peninsula (Italy). Note the samples position.



MICROFACIES



ARCHITECTURAL 3D MODEL OF INNER CAVITIES



(↑ modified from Wannier, 1980)

THE NEW GENUS, MAIN CHARACTERISTICS

The new genus is characterized by the presence of the following structures:

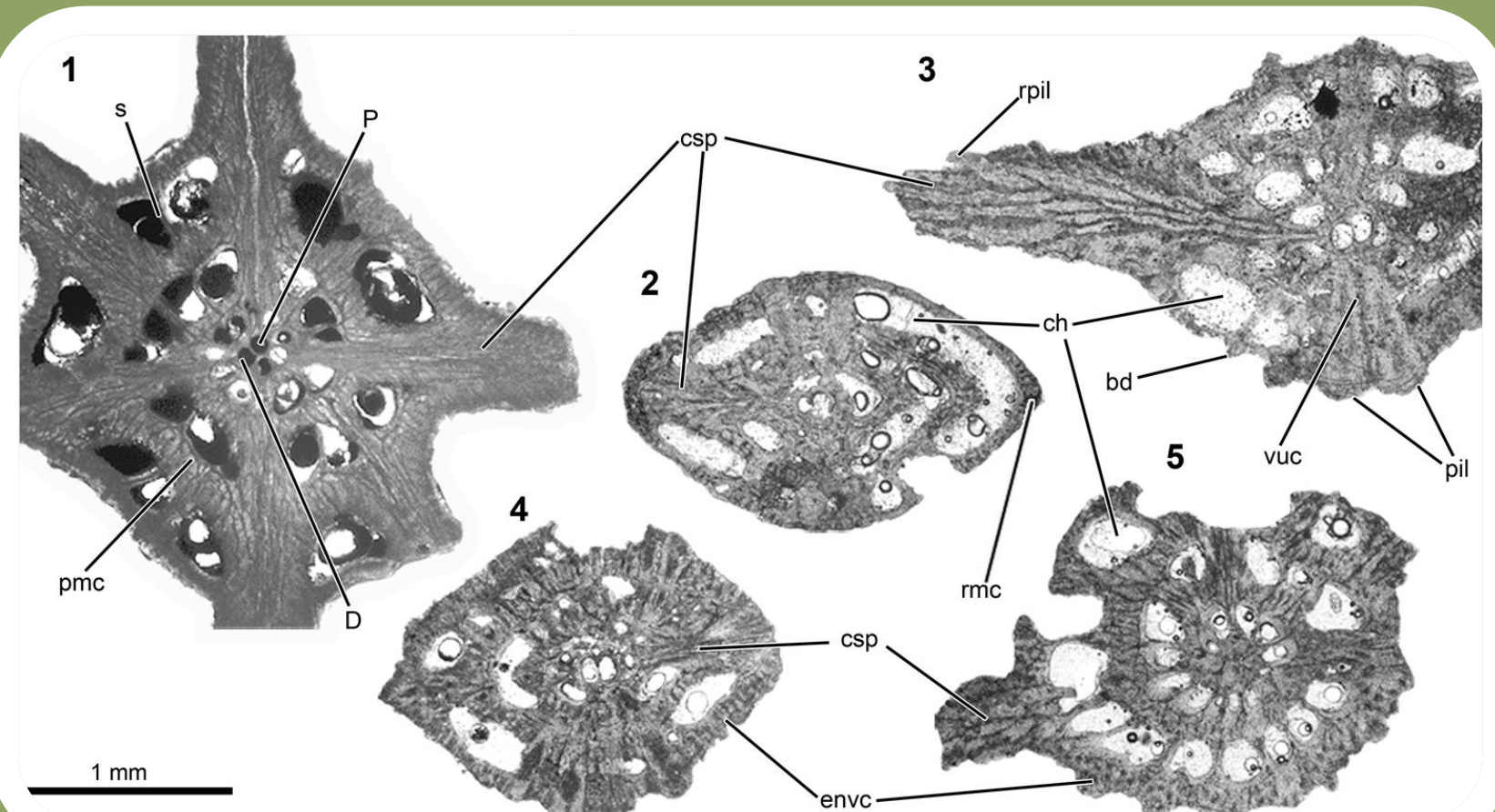
- Umbilico-spiral, intraseptal, enveloping and marginal canal systems.
- Main spines, which are big and have a complex spinal canal system consisting of asymptotic feathered and enveloping spinal canals.
- Small secondary spines.
- Chambers with squared morphology in equatorial section. They cover partially the spines giving triangular shape in oblique section.

Differences and similarities: the new genus is different from *Praesiderolites*, *Arnaudiella*, *Pseudosiderolites* and *Wannierina* by the presence of canaliferous spines. *Siderolites* and the new genus show many similarities, including the presence of spines. However, the main difference between these two morphotypes is the different architectural pattern of the enveloping and spinal canal systems (see **Architectural 3D model of inner cavities**).

NEW GENUS

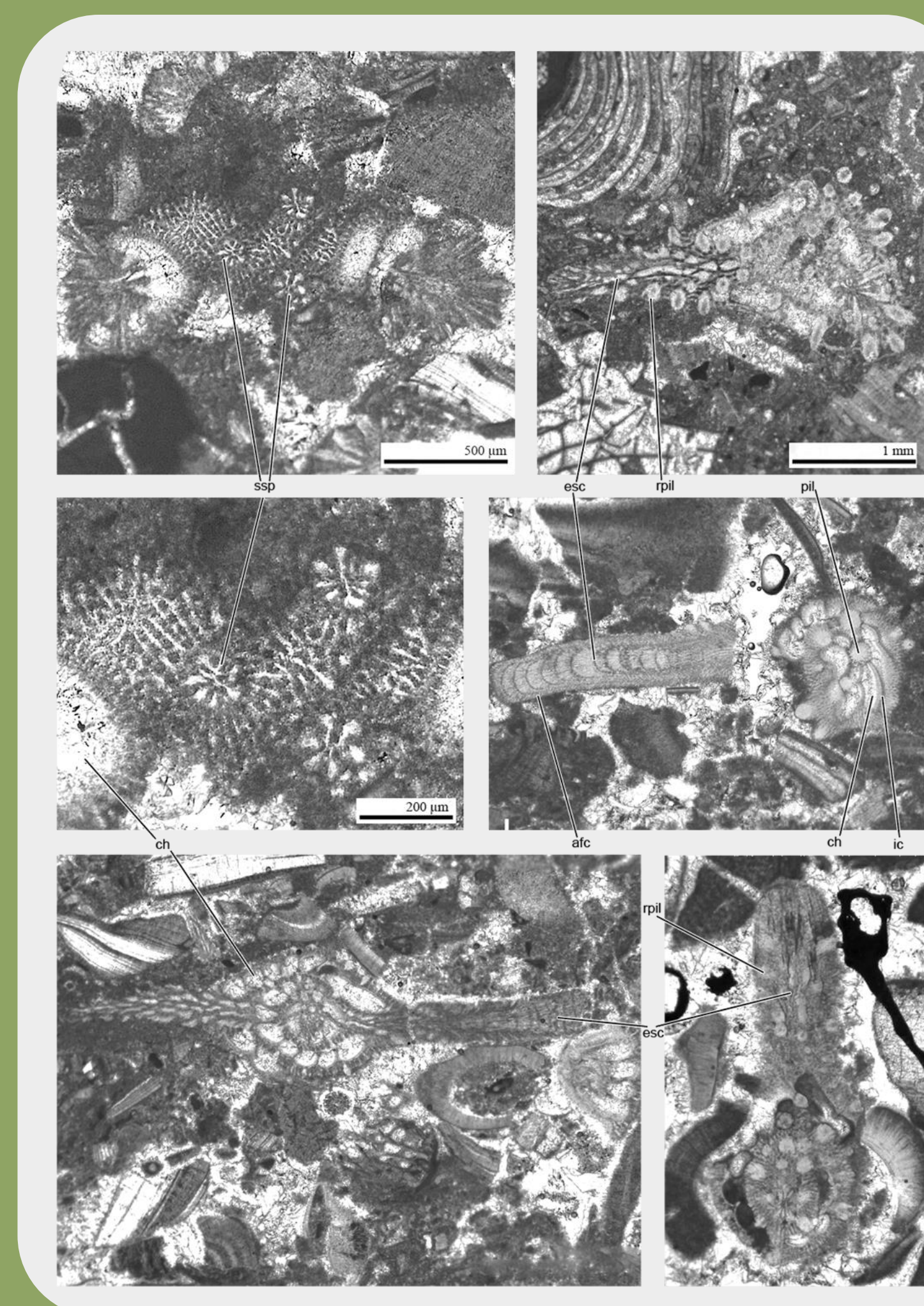
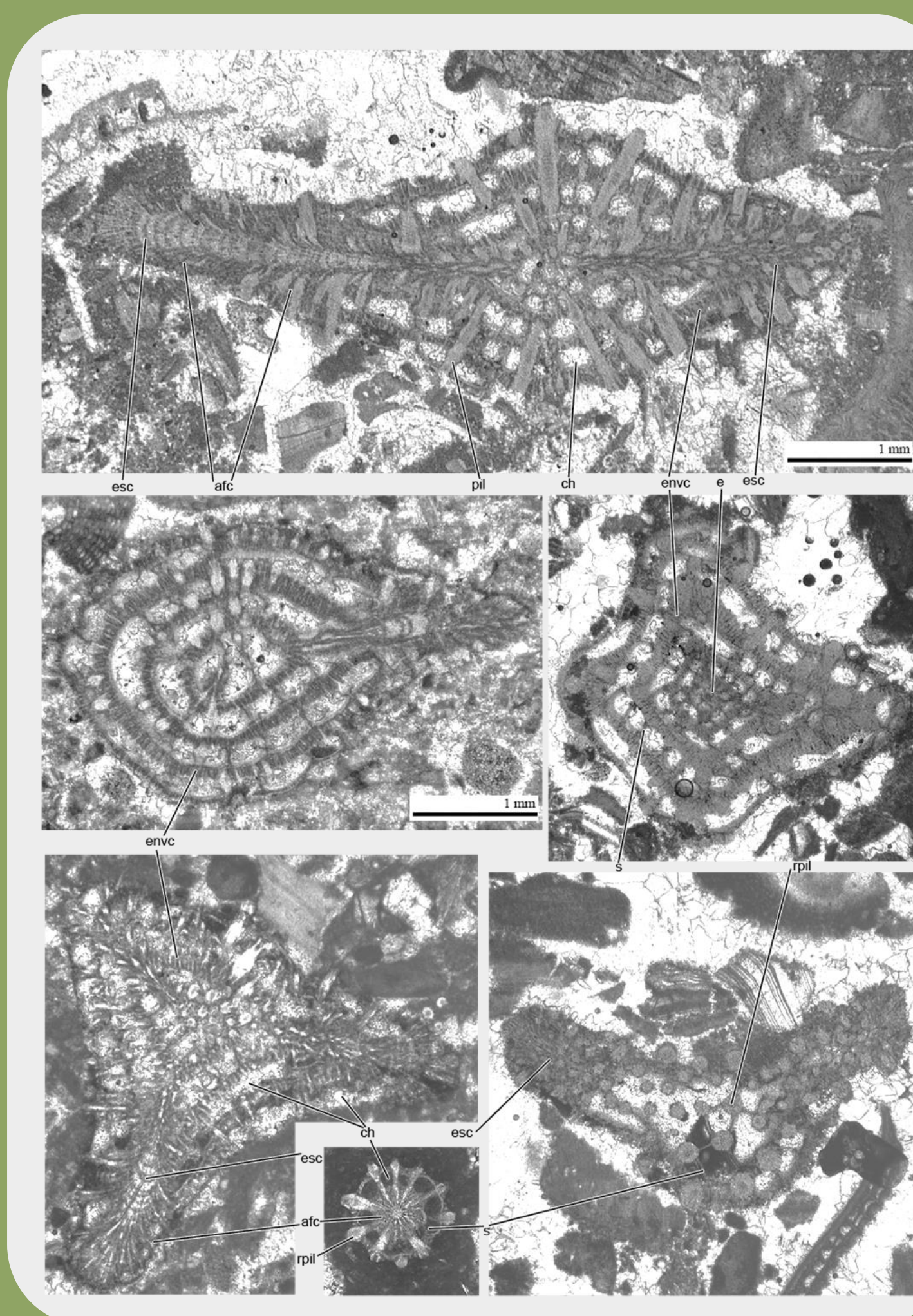
Thin sections of new genus from Il Ciole and Capo Passero (Italy), latest Maastrichtian.

SIDEROLITES CALCITRAPOIDES LAMARCK, 1801



Thin sections of isolated specimens from the ENCI quarry, Maastricht (Netherlands), upper Maastrichtian. Type locality of *Siderolites calcitrapoides* Lamarck, 1801.

Abbreviations: afc: asymptotic feathered canal; bd: bead; ch: chamber; csp: canalculated spine; D: deuteroconch; envc: enveloping canals; esc: enveloping spinal canal; ic: intraseptal canal; P: protoconch; pil: pile; pmc: parallel marginal canal; rmc: radial marginal canal; rpil: ridge pile; s: septum; sc: spiral canal; ssp: secondary spine; vuc: vertical umbilical canal



ACKNOWLEDGEMENTS

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