

The Permian macroflora from the Bletterbach-butterloch area (N-Italy)

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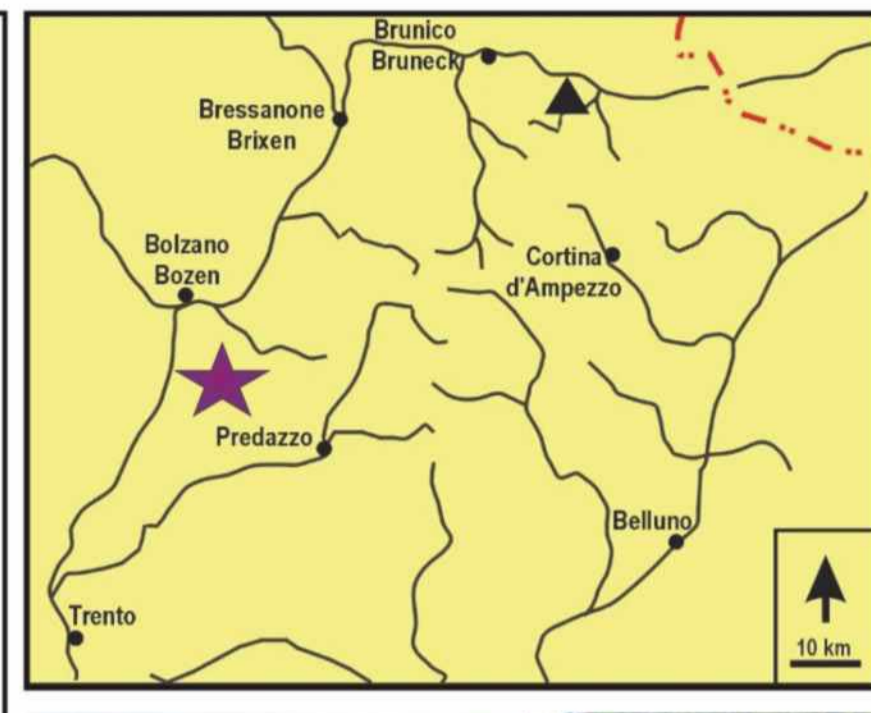
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Plant remains from the Permian of Northern Italy have been reported since the 19th century, although many authors noted that they were often small and poorly preserved. One of the most famous Permian plant localities in the Southern Alps is the Bletterbach locality in South Tyrol.



Palynological studies confirmed the low frequency of hygrophilous taxa and dated the plant-bearing beds in the Bletterbach-Butterloch section to the Middle Permian (?Capitanian) for the lowermost part of the section and a Late Permian (Abadehian to Changxingian) age for the rest of the sequence. Recently, at least two horizons in the Bletterbach/Butterloch area have delivered well preserved macro-remains. These are composed of fossil tree trunk-fragments, some shoots and leaves belonging to various conifer taxa (e.g. *Ortiseia*, *Walchia*). Additionally leaves have been collected attributed to the ginkgophytes (?*Sphenobaiera*) and probably also some leaf fragments of cycads. Relative richness and good preservation at these localities facilitates current excavations and investigations on Permian plants of the Southern Alps.

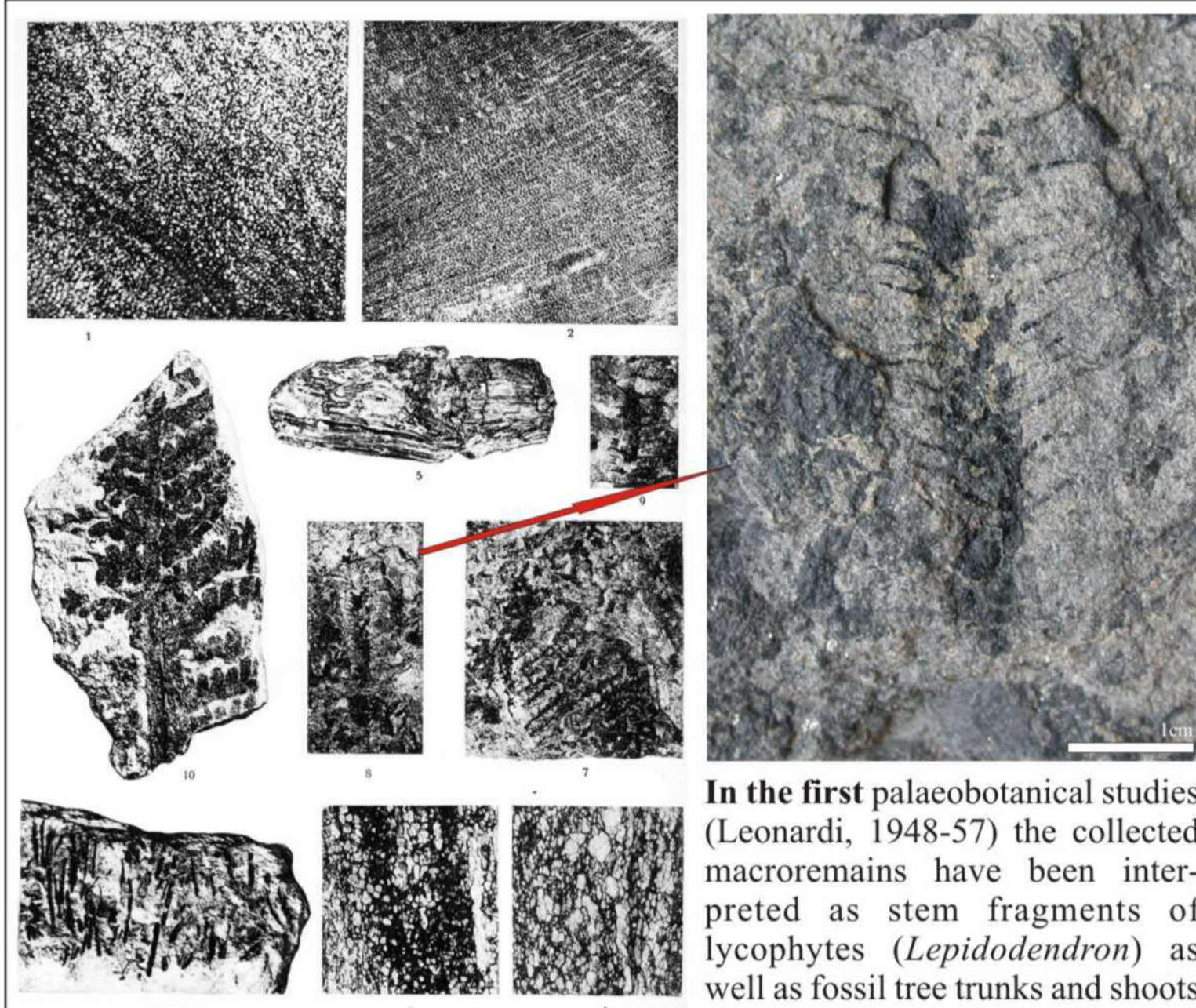
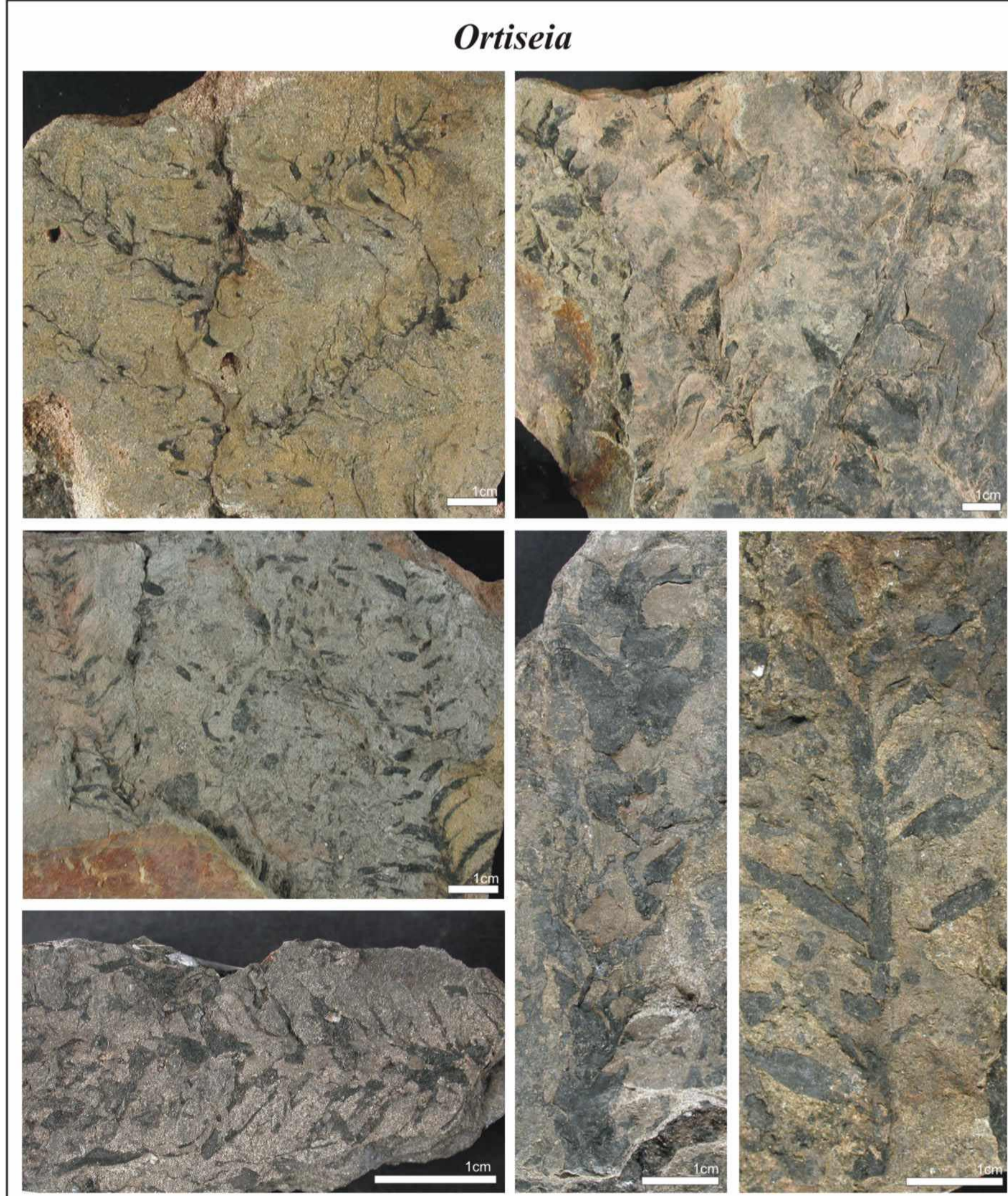
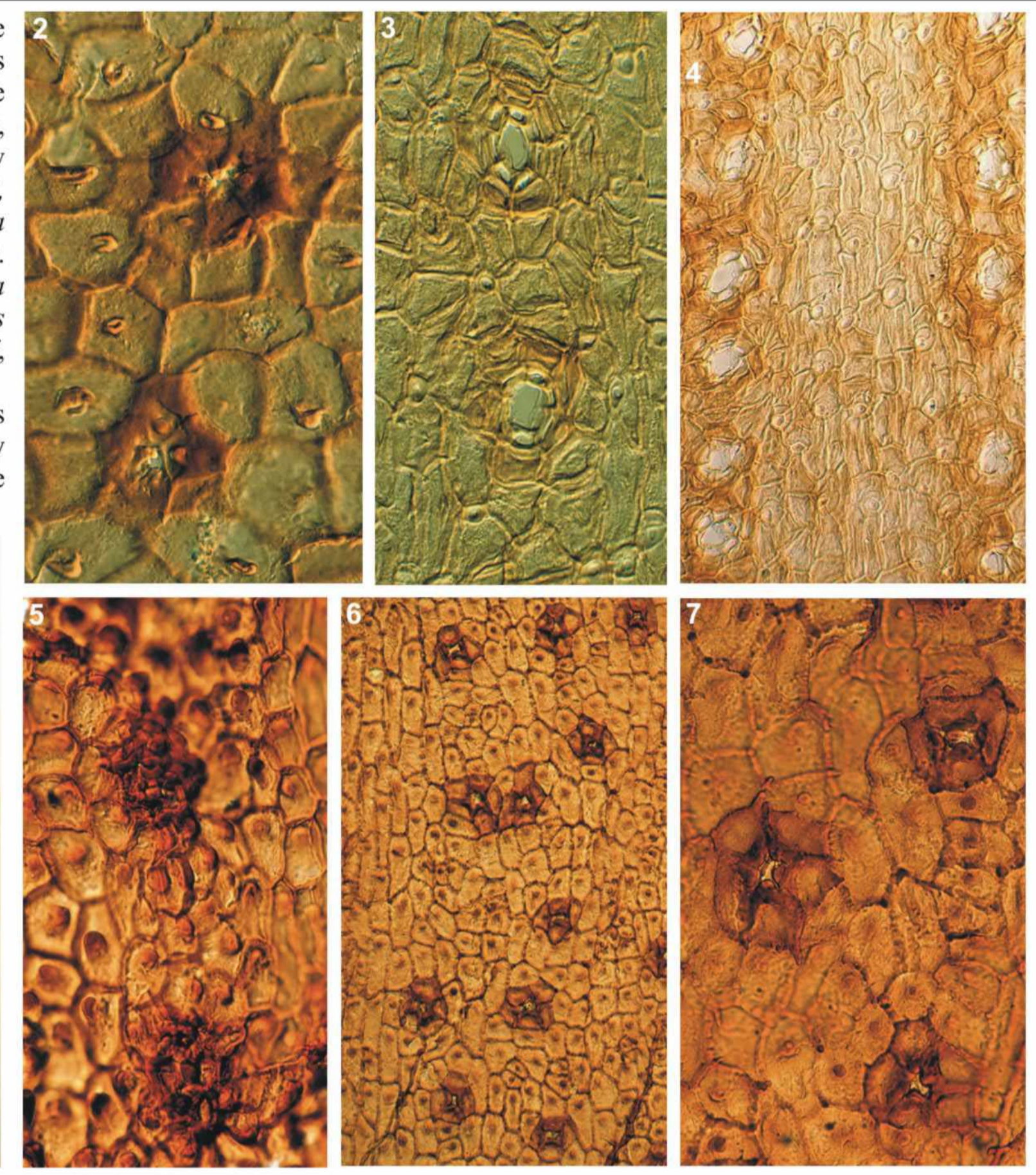
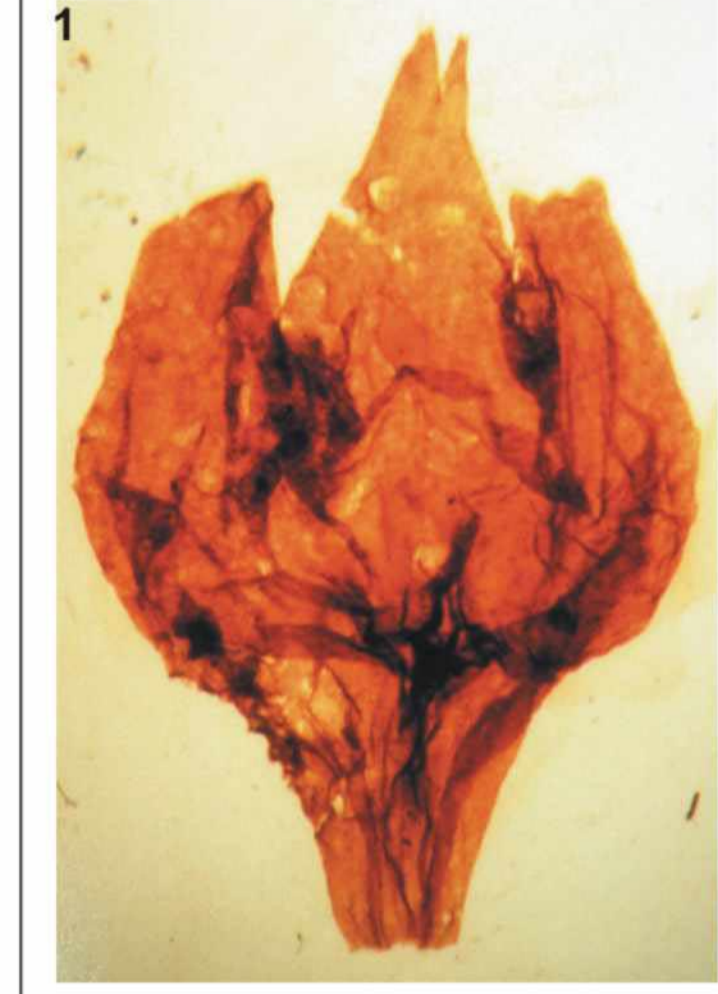


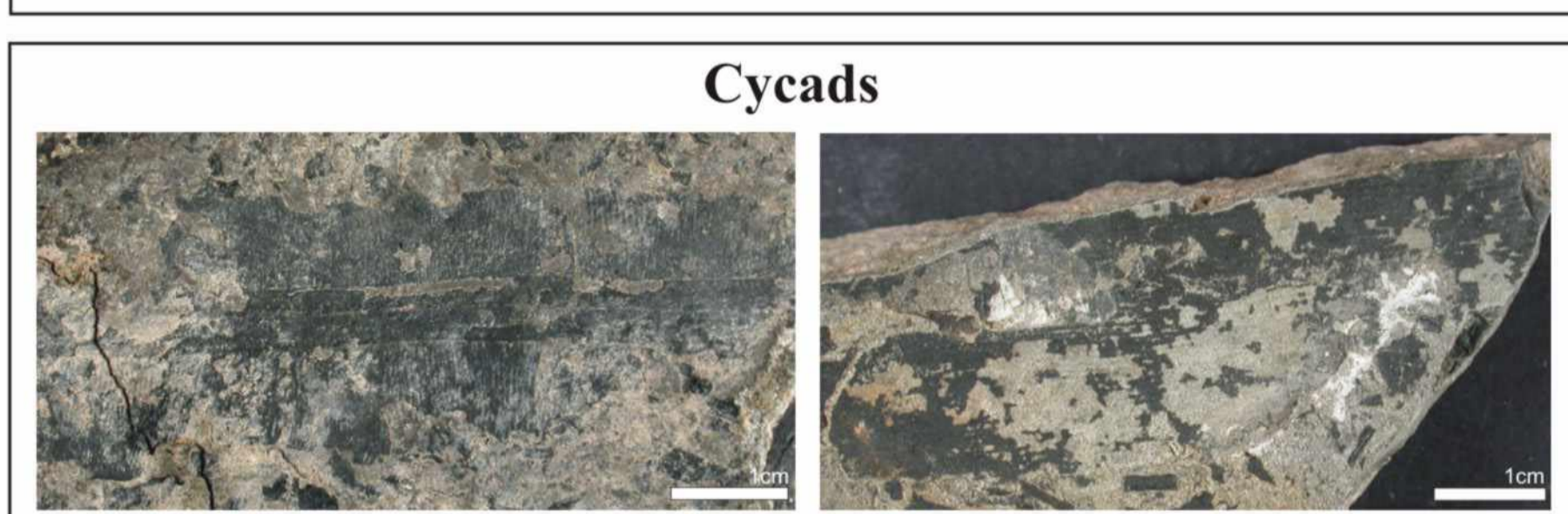
Fig. 15. Plate published by Leonardi (1948, pl. 1) as "1-2. Transversal sections of *Lepidodendron* (x 30, x 11); 3-4. Sections of the cortex (x 4); 5. Stem-fragment of *Lepidodendron* (x 1); 6. Leaf fragment of *Lepidodendron* cf. *sternbergi* Lind e Hutt vel *Schizolepis permensis* Heer (x 1); 7. Shoot of *Lebachia* (= *Walchia* Auct.) *taxifolia* Florin (x 0.7); 8-9. Shoots of *Lepidodendron* vel *Lebachia* (x 0.7, x 0.8); 10. Leaf of *Pecopteris* (*Cyatheetes*) cf. *miltoni* Artis vel *densifolia* Göppert from Neumarkt (Egna) (x 1).

In the first palaeobotanical studies (Leonardi, 1948-57) the collected macroremains have been interpreted as stem fragments of lycophytes (*Lepidodendron*) as well as fossil tree trunks and shoots of conifers (*Lebachia*). Recent studies have shown that these identifications cannot be confirmed. The specimens identified as *Lepidodendron* represent defoliated conifer axes. Their rhomboidal leaf scars may lead to confusion. However, the genus *Lepidodendron* had become extinct in Europe by the end of the Carboniferous.

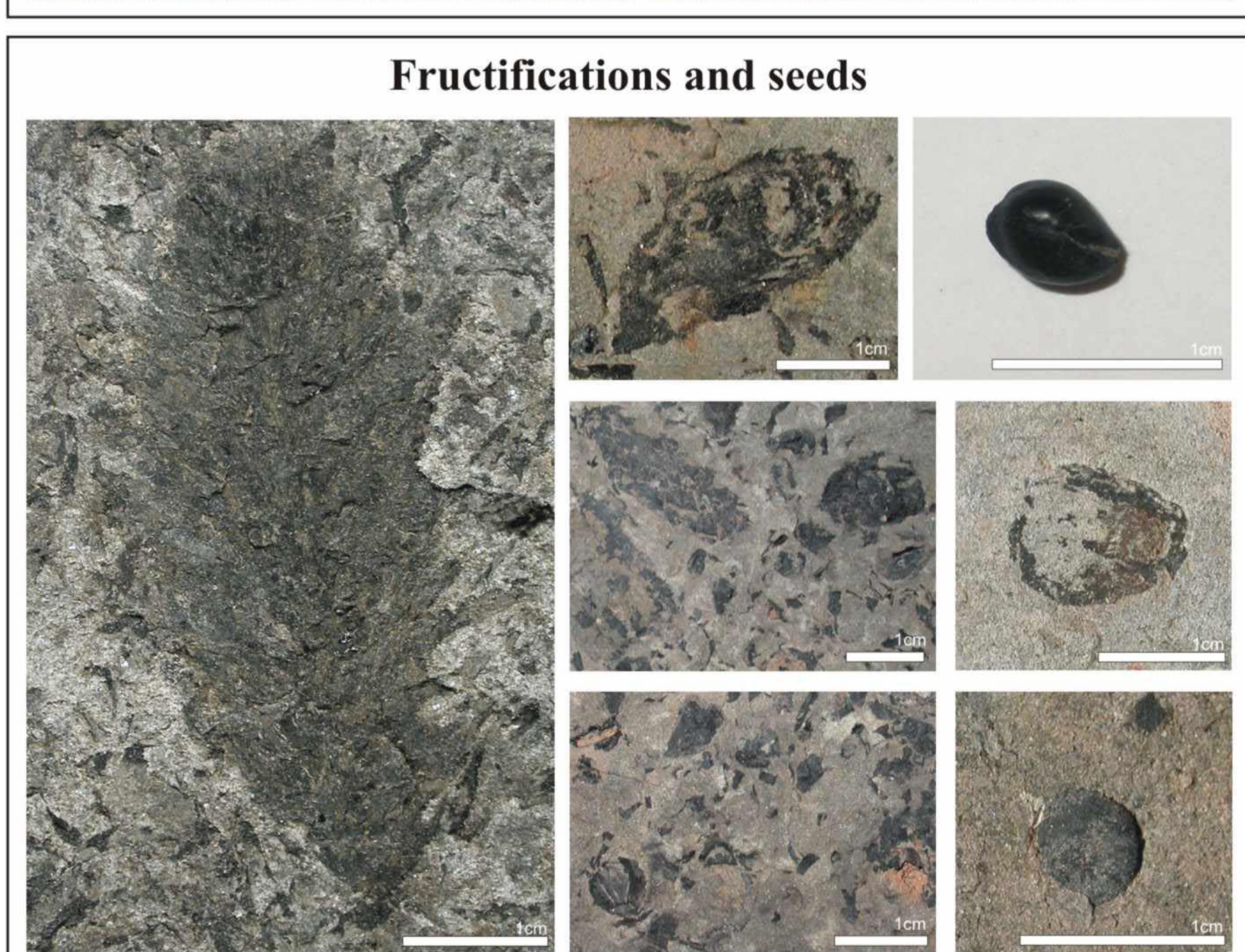
Afterwards (1974-88), studies were primarily focused on coniferous fructifications (Fig. 1) which are excellently preserved in this locality, giving origin also to several new genera and species (*Ortiseia visscheri*, *Majonica alpina*, Fig. 1-2; *Dolomitica citterti*). Other identified taxa are *O. jonkeri* (Fig. 3-4), *Pseudovoltzia liebeana* (Fig. 5) and *Quadrocladus* sp. (Fig. 6-7) (e.g. Clement-Westerhof, 1984). Bulk macerations for fossil cuticles show a flora strongly dominated by conifers; additional elements include pteridosperms and ginkgophytes.



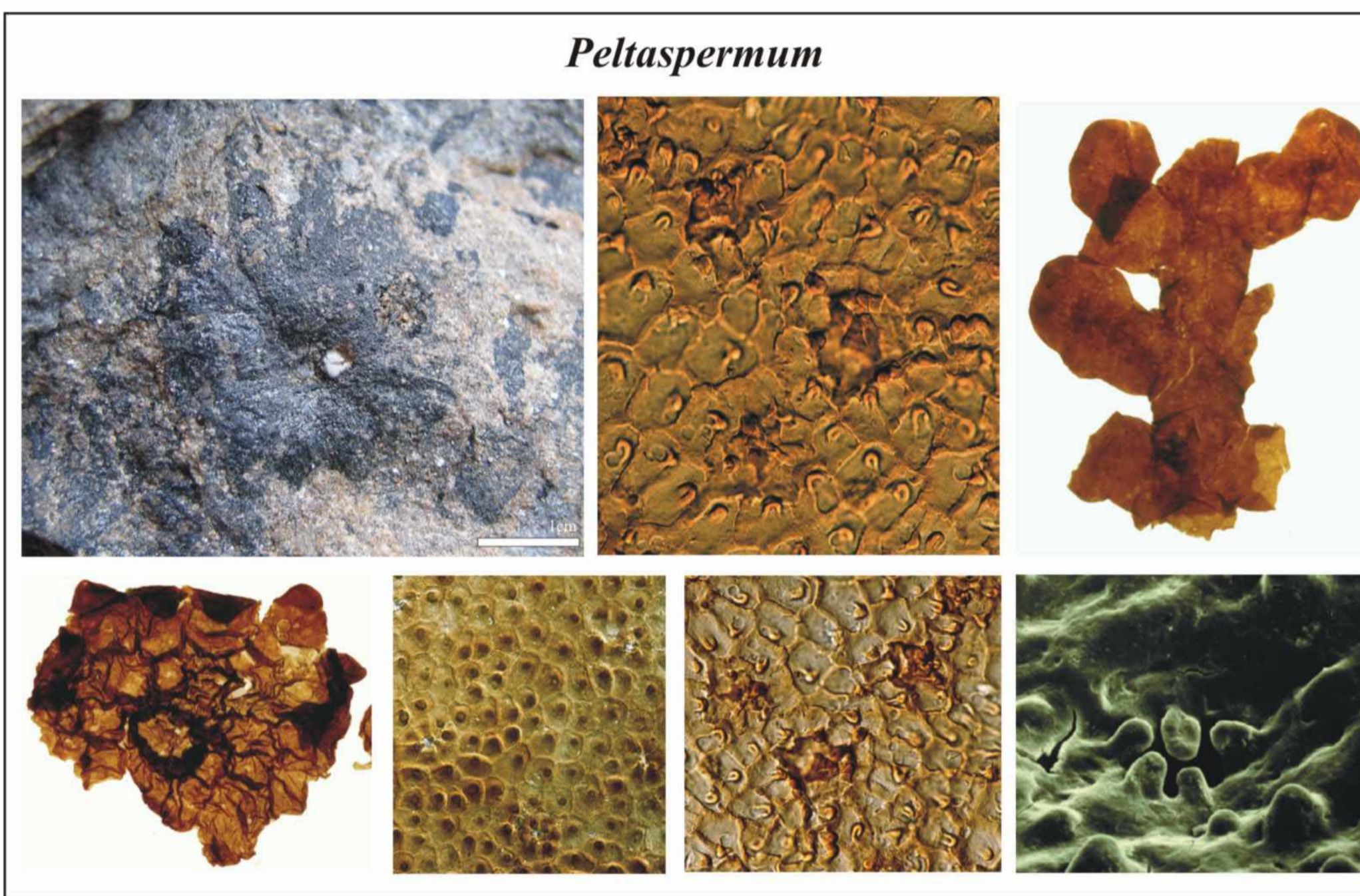
Ortiseia



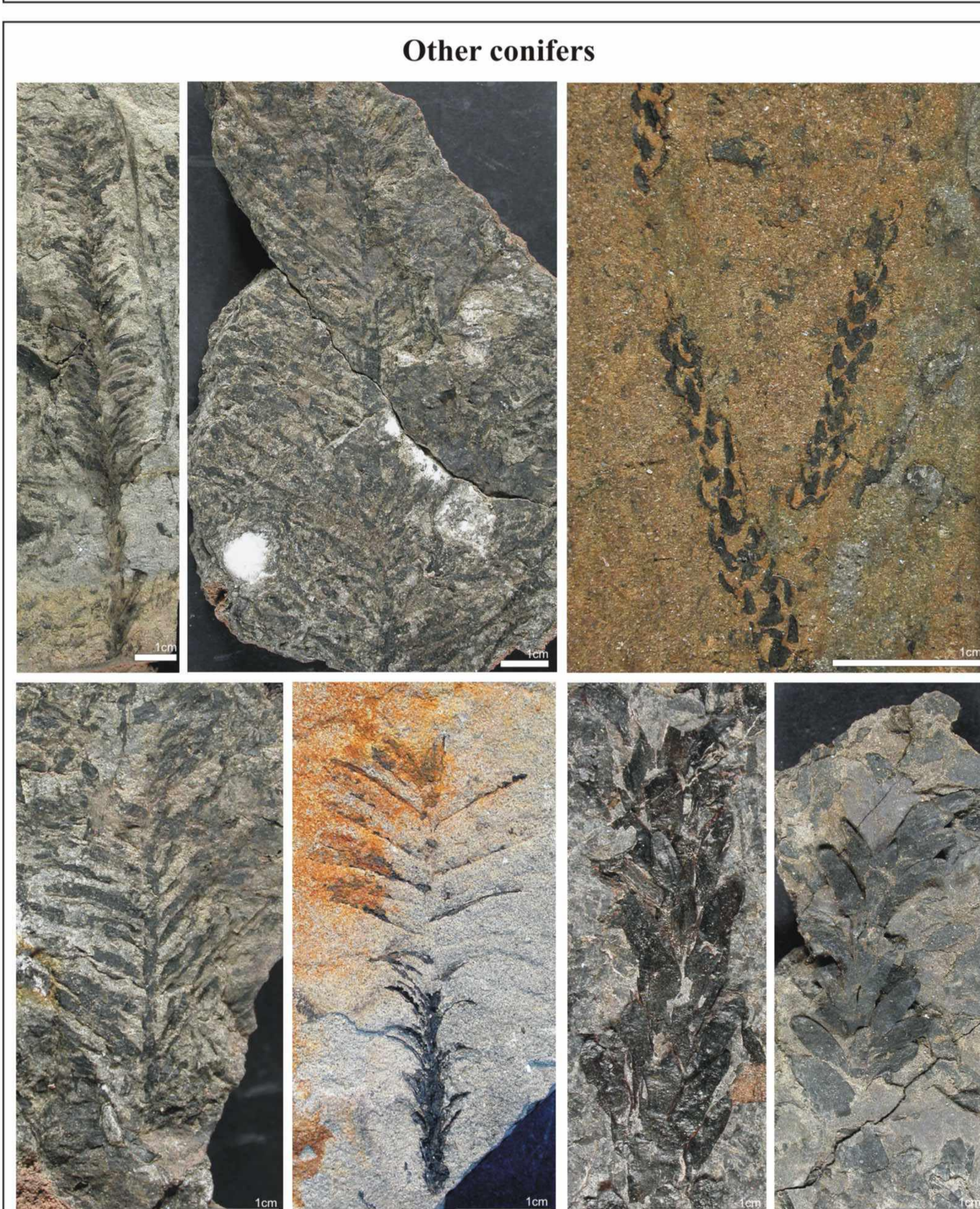
Cycads



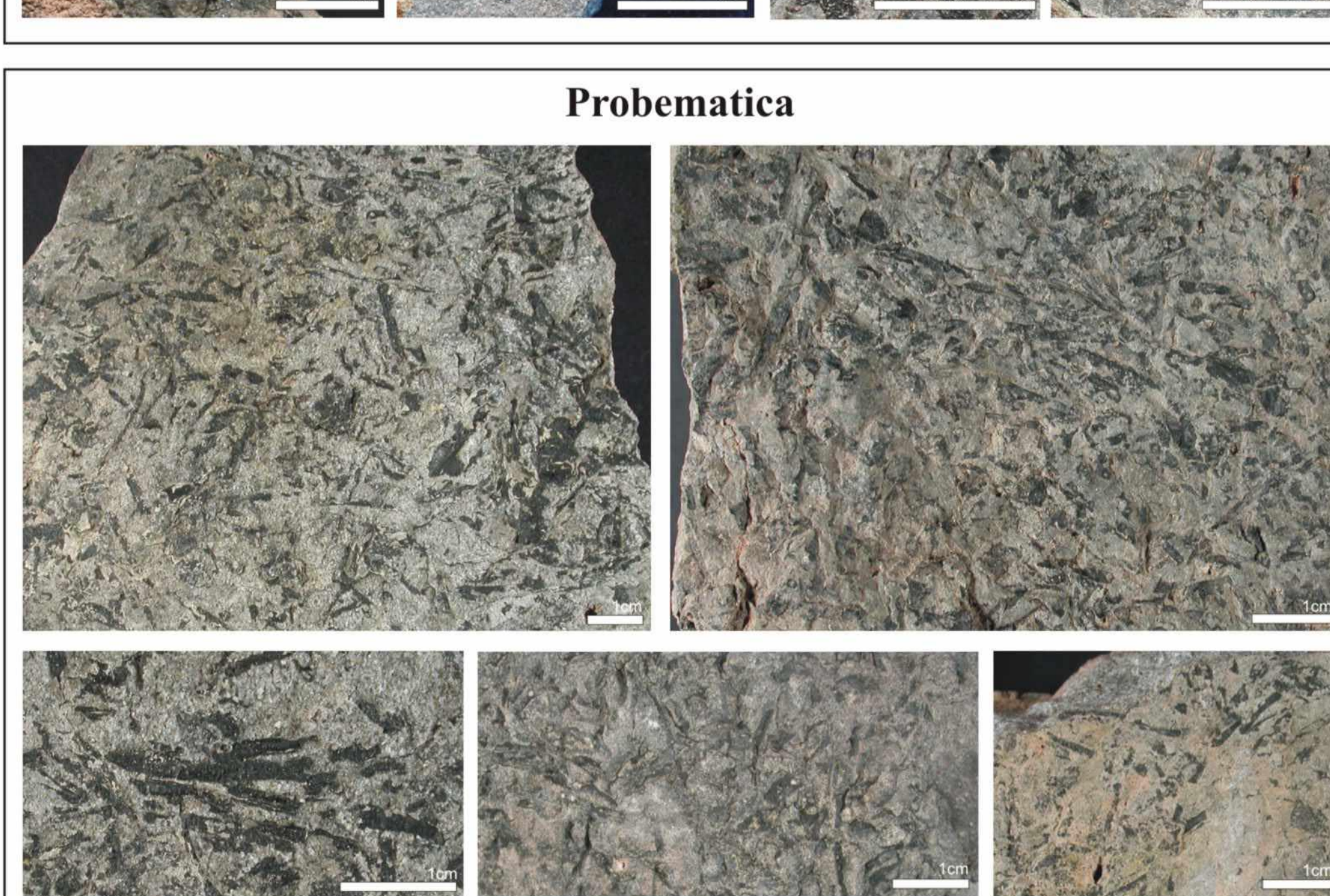
Fructifications and seeds



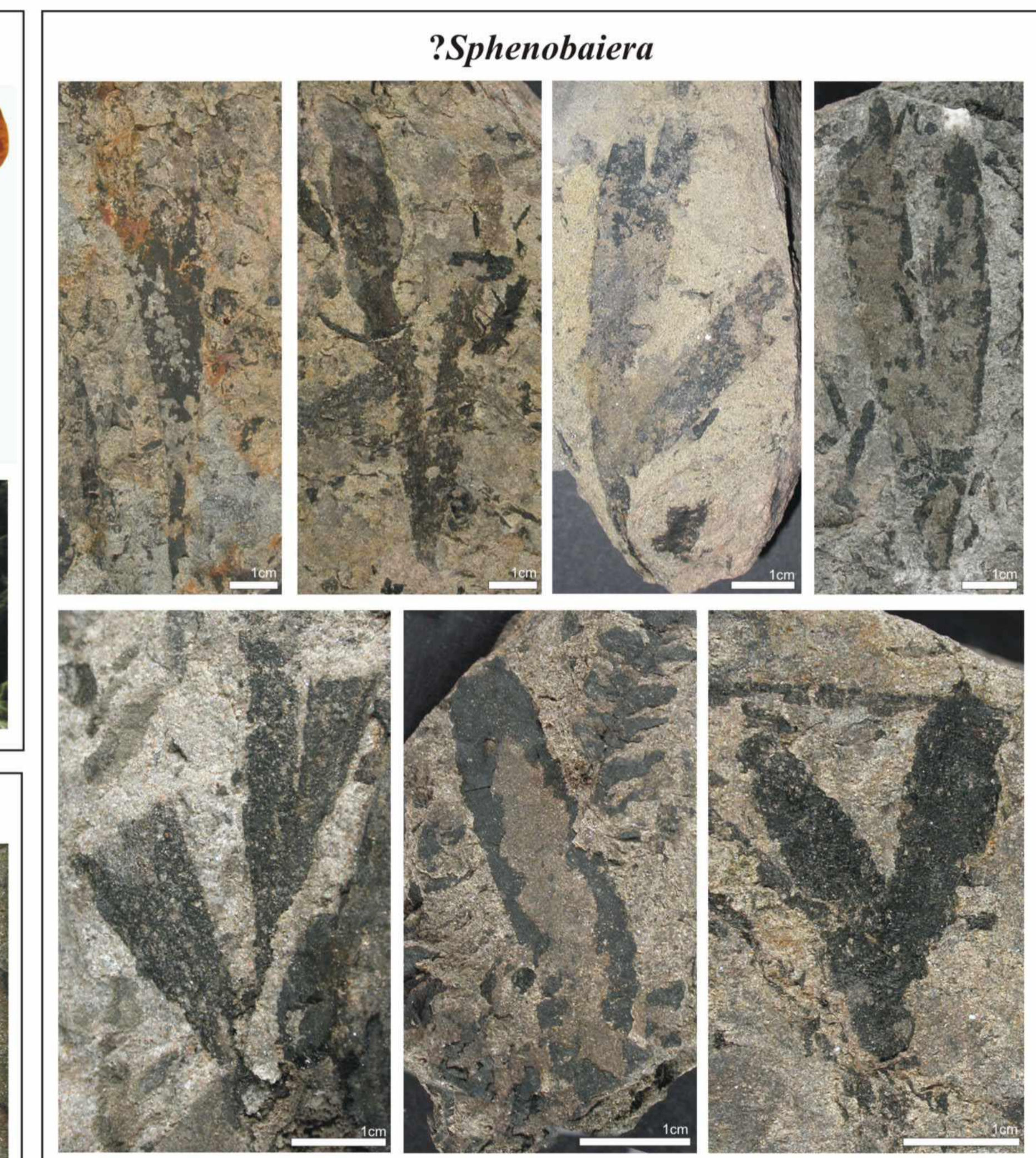
Peltaspermum



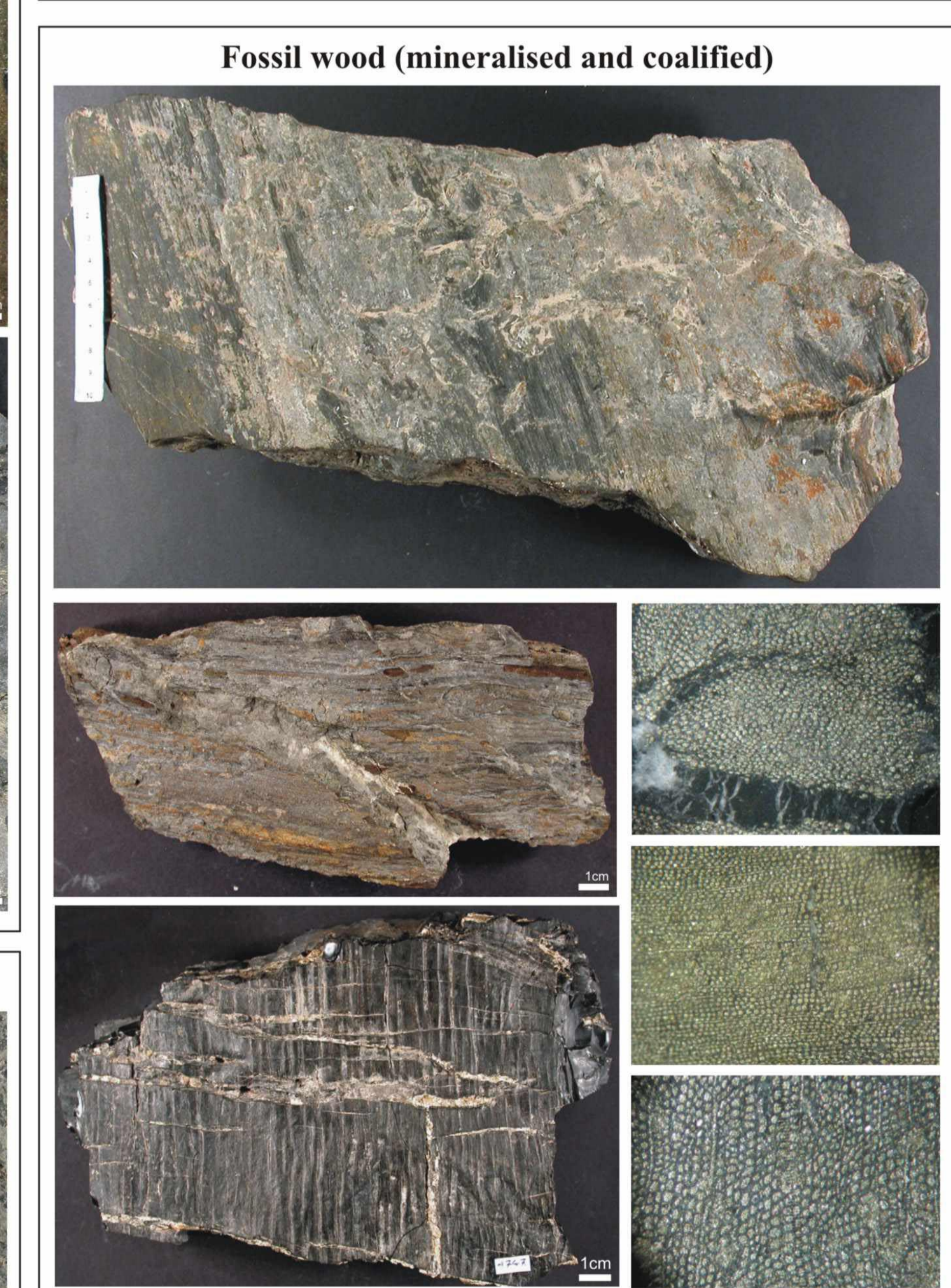
Other conifers



Probemantica



?Sphenobaiera



Fossil wood (mineralised and coalified)

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