

# *Ginkgoites acosmia* Harris from the Polish Rhaetian

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**ABSTRACT.** A fragment of a *Ginkgoites acosmia* leaf has been collected in the borehole Gradzanowo 3, central Poland. Although, the petiole and the base of the leaf have not been preserved, the morphology of segments and their cuticular structure show features comparable to those of *G. acosmia* described by Harris from Greenland. The type specimen originates from the Rhaetian of Greenland, from the *Lepidopteris* Zone. The fossil remain from Gradzanowo is accompanied by the fragment of a *Lepidopteris ottonis* leaf, which is the guide form for the Rhaetian age.

**KEY WORDS:** *Ginkgoites*, *Lepidopteris* zone, Rhaetian, Poland

## INTRODUCTION

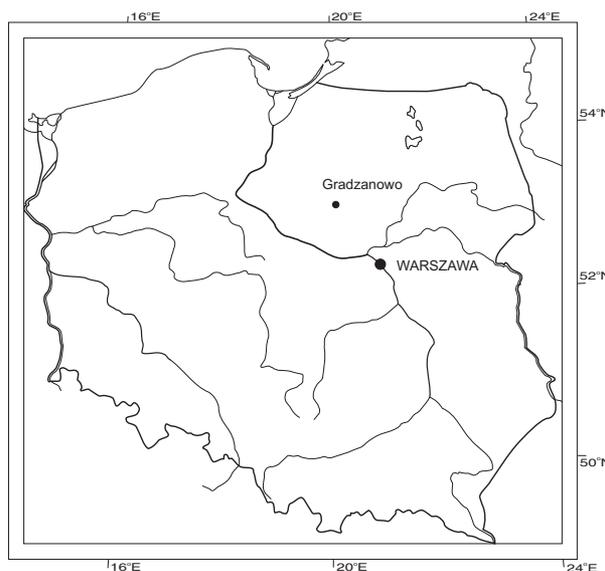
In the seventies, some fossil plant remains were collected from the borehole Gradzanowo 3 in the region of Gradzanowo (25 km NE from Warsaw: latitude 52°54'N, longitude 20°1'E, Fig. 1).

One fragment of the core from a depth of 2125 m shows leaf fragment on each side. One of the leaves belongs to *Lepidopteris ottonis* (Goeppert) Schimper examined and published by Barbacka (1991). The second leaf is a ginkgoalean one, which has been recently examined and determined as *Ginkgoites acosmia* Harris. The species has been known only from the Rhaetian of Greenland so its new locality in Poland contributes to our knowledge about its occurrence.

## MATERIAL

One core fragment, about 2 cm thick and 10 cm in diameter with plant remains on its both sides was examined. It is stored in the Palaeobotanical Museum of the W. Szafer Institute of Botany, Polish Academy of Sciences in Cracow (IB PAN PM S 942). The leaf remains are preserved in a fine grained grey mudstone.

Both leaves are incomplete, in the ginkgoalean one the base and petiole are lacking, only five lobes are present with a preserved cuticle.



**Fig. 1.** Location of the borehole Gradzanowo 3 with the Rhaetic fossil plant remains

## SYSTEMATICAL DESCRIPTION

## Ginkgoales

*Ginkgoites* Seward 1919*Ginkgoites acosmia* Harris 1935

Pl. 1, figs 1–6, Fig. 2

1935. *Ginkgoites acosmia* Harris, p. 8, pl. 1, figs. 3–5; pl. 2, figs 1, 2; Text-figs 3 E–H, Text-fig. 4 I.  
 ?1935. *Ginkgoites fimbriata* Harris, p. 6, pl. 1, fig. 11; pl.2, figs 7, 8; Text-fig. 3 A–D.

The fragment of the leaf lamina shows five segments (Pl.1, fig. 1). Four of them arise from one leaf base and fork once or twice into unequal parts. The segments are 20–35 mm long and about 5–7 mm wide in the middle part, their apices are irregularly notched. Each segment shows about five thin and indistinct veins dichotomizing towards the apex. After maceration round or oval resin bodies of different size (170–330  $\mu\text{m}$ ) are observable between the veins (Pl. 1, fig. 2).

The leaf is amphistomatic. The cuticle is of medium thickness, the upper cuticle is thicker than the lower one. The cells on the upper cuticle are irregular, sometimes nearly rectangular, over the veins elongated. Cell walls are thick, straight or finely undulated, usually with a central low papilla. Stomata are scattered (Pl. 1, figs 3, 5).

On the lower cuticle cells are more irregular and more elongated than on the upper cuticle, cell walls are more undulated, papillae occur much less and are less clear (Pl. 1, fig. 4). The veins are indicated by elongated cells. Numerous stomata are arranged in wide strips between the veins, orientated irregularly or lon-

gitudinally. They consist of 4–6 subsidiary cells forming a ring around the guard cells. Subsidiary cells have thickenings around the stomatal pore, or often hollow papillae that project over the aperture (Pl. 1, fig. 6).

## DISCUSSION

Although the leaf from Gradzanowo 3 is incomplete and some morphological characteristics are lacking (base and petiole), the size and morphology of the segments, as well as the cuticular features are well comparable to those of *Ginkgoites acosmia* described by Harris from East Greenland (Harris 1935). Additional argument for this determination is the leaf of *Lepidopteris ottonis* found in the same core sample. In Greenland they also occur together, in the Rhaetian *Lepidopteris* zone.

*Ginkgoites acosmia* has not been known from any other localities, however it was mentioned by various authors (Andrews 1961, Walton 1940, Lemoigne 1988, Taylor & Taylor 1993) giving short descriptions and illustrations after Harris (1935). Harris (1935) and Andrews (1961) also gave a short comparison with other Rhaetian ginkgoalean species. According to Harris (1935) the shape of the lamina of *G. acosmia* is rather constant in type of leaf branching as well as in the cuticular structure, although "it ranges in size and the angle made by the base of the lamina and the petiole". The apex of the segments seems to have an important diagnostic value in ginkgoalean leaves and in *G. acosmia* it is characteristically irregularly notched. Harris (1935) described also *G. fimbriata* Harris and *G. taeniata* (Braun) Harris, of which the macro- and micromorphology is very similar to those of *G. acosmia* (as was also discussed by Harris 1935). On the grounds of the description and illustrations, at least *G. fimbriata* might be in our opinion regarded as conspecific with *G. acosmia*. The material of *G. fimbriata* consisted only of a few specimens and a difference discussed by Harris (1935) – hollow papillae on the epidermal cells – is not very strong, as *G. acosmia* also possesses papillae. Since the original specimens are at this moment inaccessible for examination, we can not either revise the two species or propose a fusion between the two. We can only indicate that such a revision would be necessary in order to make

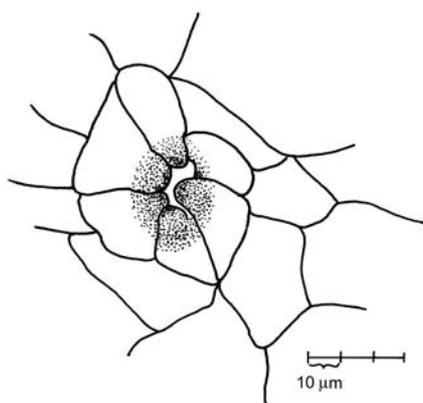


Fig. 2. *Ginkgoites acosmia* Harris the papillate stoma from the lower cuticle

the systematics of ginkgoalean leaves better defined.

In the present paper we used the original name *Ginkgoites acosmia*, given by Harris (1935). In fact, two generic names: *Ginkgoites*, after Seward (1919), and *Ginkgo*, according to Florin (1936), have been used parallel for the same leaf forms so far. Harris used both names, namely *Ginkgoites* in his earlier works, i.e. on the flora from East Greenland (Harris 1935) in which the species *Ginkgoites acosmia* was described. Later, when working on the Jurassic flora from Yorkshire, Harris discussed the genera *Ginkgoites* and *Ginkgo*, leaning to Florin's point of view, and made some new combinations under the name *Ginkgo* (Harris & Millington 1974). The name of *Ginkgoites acosmia* was not changed. However, this paper does not aim at taking stand on nomenclatural problems or making new combinations. The revision of the genus would be possible only after examination of its fructification.

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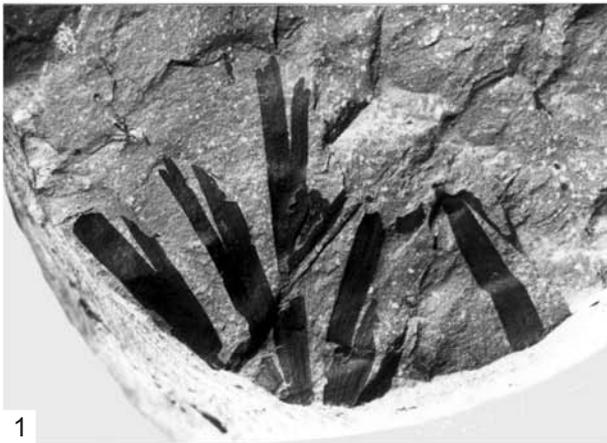
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# PLATE

## Plate 1

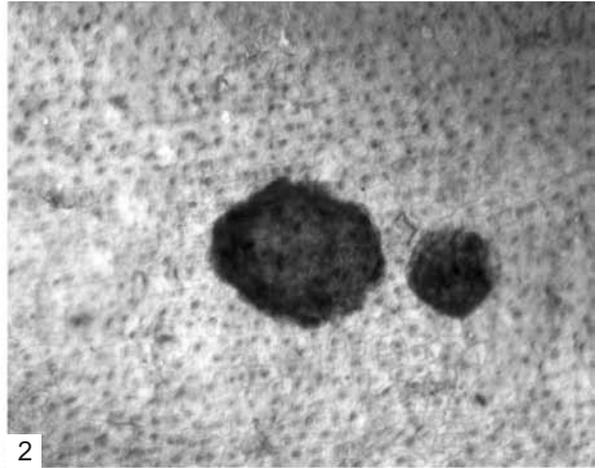
*Ginkgoites acosmia* Harris, Gradzanowo 3

1. The examined specimen
2. The upper cuticle with resin bodies
3. The upper cuticle, note the papillae on the epidermal cells
4. The lower cuticle with stomata arranged in bands between the veins
5. The upper cuticle, stoma
6. The lower cuticle, stomata



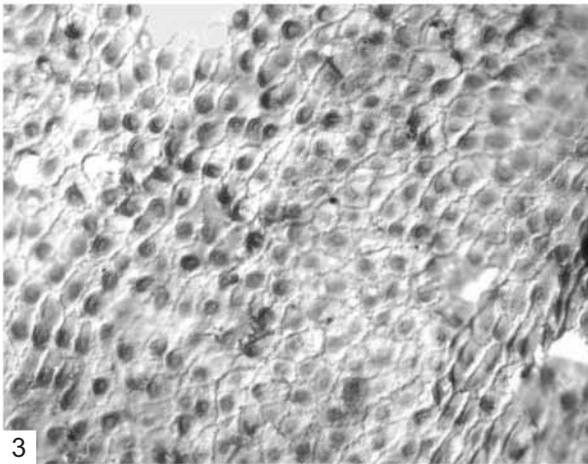
1

1 cm



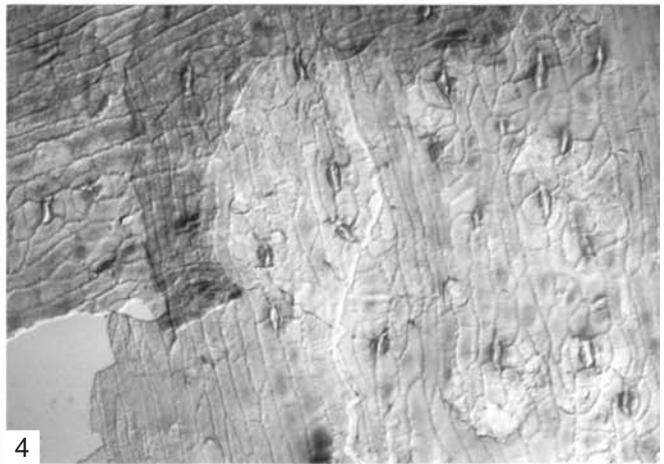
2

200 μm



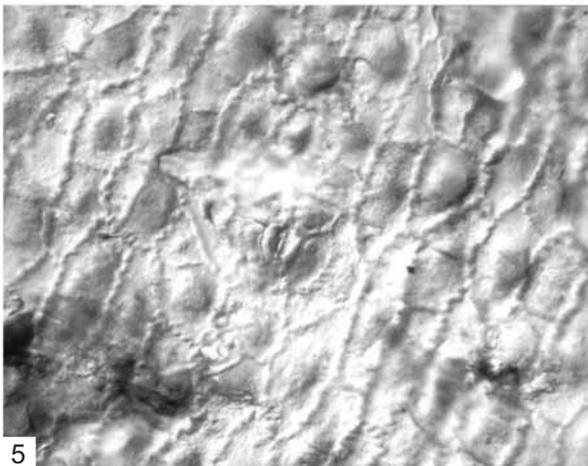
3

100 μm



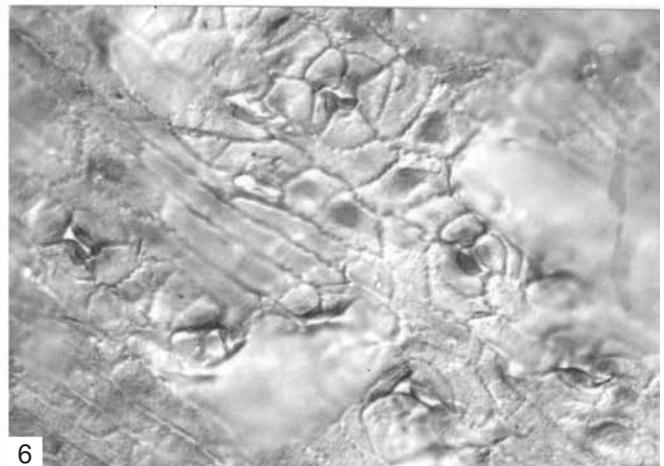
4

100 μm



5

50 μm



6

50 μm