

## PALYNOLOGICAL PROFILES OF THE EEMIAN AND EARLY VISTULIAN IN SOUTH-WESTERN POLAND

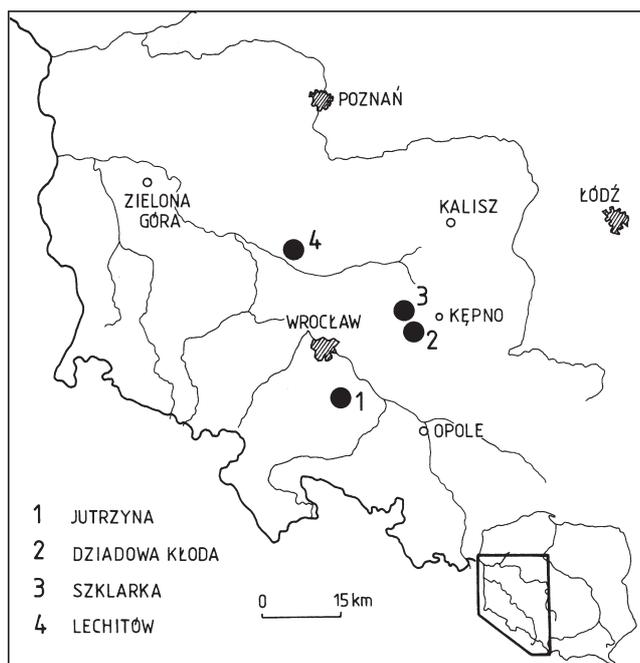
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**ABSTRACT.** This paper presents the results of a pollen analysis of the Eemian sediments at Dziadowa Kłoda, Szklarka, Lechitów, Jutrzyzna and preliminary results from the Early Vistulian at Dziadowa Kłoda and Szklarka in south-western Poland.

**KEY WORDS:** pollen analysis, Eemian, Vistulian

Four localities of the Eemian Interglacial and Vistulian in south-western Poland are described, on the basis of palynological investigations (Fig. 1). The Dziadowa Kłoda, Szklarka and Jutrzyzna localities are situated in Lower Silesia, while Lechitów is in the Great Polish Lowland. The profiles from Jutrzyzna and Lechitów contain organic sediments of the Eemian Interglacial, while those from Dziadowa Kłoda and Szklarka represent the Eemian Interglacial and the Early Vistulian. Within the Eemian succession three periods can be identified: the protocratic, mesocratic and telocratic (Iversen 1958, Tobolski 1991).



**Fig. 1.** Localities of the investigated profiles

The Lechitów profile consists of 22 m thick lacustrine sediments: clay, silt and a silt of gyttja type and its pollen diagram represents the complete Eemian succession (Fig. 2). In the protocratic phase pine-birch and birch-pine forest dominated, but herbaceous plants were also present. In the older part of this phase *Pinus* pollen was the most abundant but by its end *Betula* pollen had become dominant. Throughout this period climate was cool and dry.

In the next phase pine-birch forest was gradually replaced by mixed pine-oak forest with elm and hazel in the undergrowth. In the mesocratic phase, diagnostic for the Eemian Interglacial optimum, intensive development of thermophilous deciduous forest with dominant hazel took place. During this phase the occurrence of *Viscum*, *Hedera* and *Taxus* indicates a moderately warm and humid climate (Zagwijn 1996) although the maximum amount of *Taxus* did not exceed 1.5%. Higher proportions of these genera were noted in the profiles from Zofiówka and Imbramowice in Lower Silesia (Mamakowa 1989, Kuszell 1997).

After the climatic optimum, hornbeam-lime forest with an admixture of hazel dominated. At the end of the mesocratic phase the thermophilous deciduous trees were present in low percentages and the high values of *Alnus* indicate an extension of swampy areas. At that time the climate was still warm but becoming wetter.

The upper part of this profile belongs to the telocratic phase. This period was characterized by the spread of coniferous forest. In the older part of this phase fir-spruce forest was widespread with the importance of thermophilous deciduous forest species much reduced, although hornbeam continued to play a prominent role in the prevailing communities. Of the other deciduous trees, *Cory-*

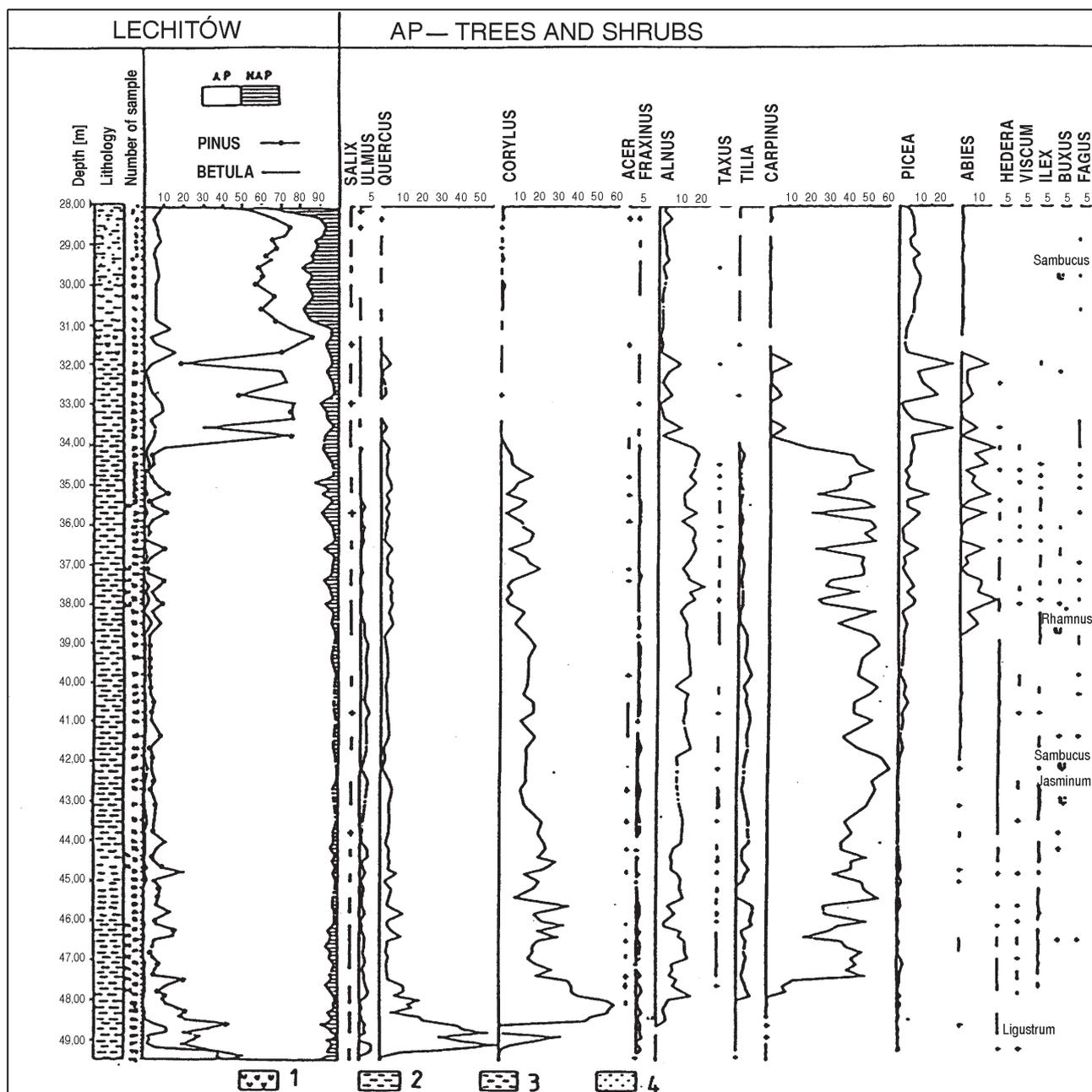


Fig. 2. Pollen diagram from Lechitów. 1 – gyttja, 2 – clay, 3 – silt, 4 – sand

*lus*, *Quercus* and *Tilia* were present in small quantities. The upper part of this telocratic phase is characterized by high amounts of *Picea* and *Pinus* and at the top of this period *Pinus* was dominant, although spruce and alder were present as well. At that time a clear deterioration of the climatic conditions was taking place.

The next profile, Jutrzyzna, is located in the south-east of Lower Silesia and comprises sediments 3.40 m thick which contain peat and organic silts. The Jutrzyzna diagram displays features diagnostic for the Eemian Interglacial (Fig. 3). It is characterized by a well-developed optimum zone with *Corylus* dominant and distinct zones of *Carpinus* and *Abies-Picea-Alnus*. The expansion and maximum percentage of spruce and fir in the forest com-

munities of this period are unquestionably a wide-ranging.

Dziadowa Kłoda and Szklarka are located in the north-east of Lower Silesia with Szklarka about 2 km to the north of Dziadowa Kłoda and their profiles consist of 7 m thick lacustrine and swampy sediments. The pollen diagram from Dziadowa Kłoda represents the Eemian Interglacial and the Early Vistulian. The diagrams from these localities represent the complete Eemian interglacial succession of trees in the following order: *Betula*, *Pinus*, *Ulmus*, *Quercus*, *Corylus*, *Taxus*, *Carpinus*, *Picea*, *Abies* and *Pinus* (Figs 4, 5).

The Dziadowa Kłoda and Szklarka profiles contain a thick series of deposits representing a cool section, with

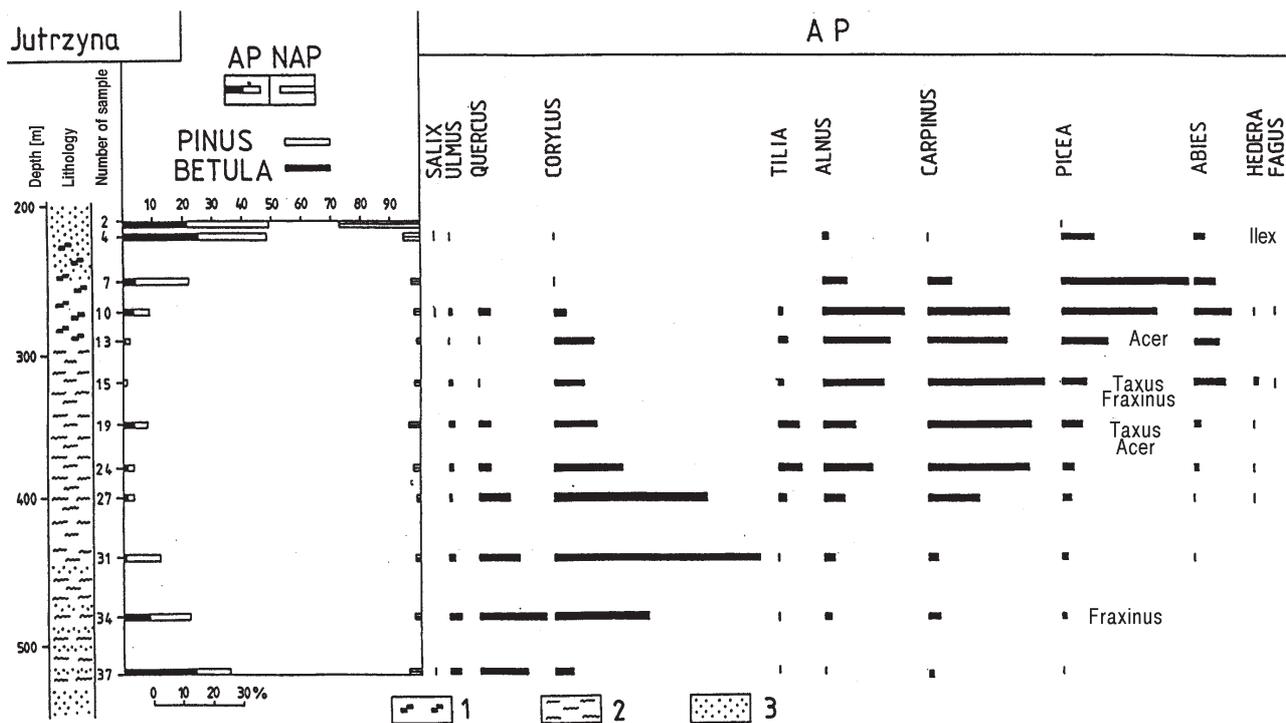


Fig. 3. Pollen diagram from Jutrzyzna. 1 – peat, 2 – silt, 3 – sand

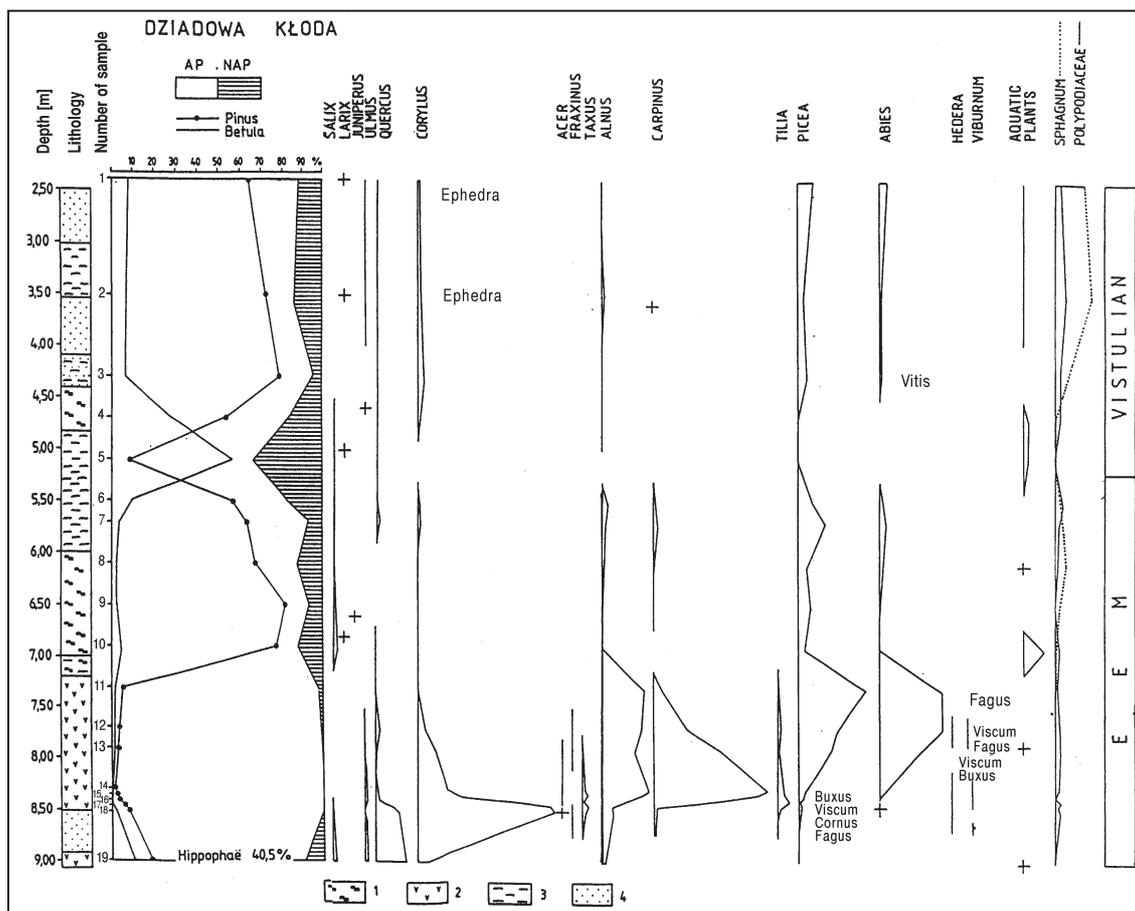


Fig. 4. Pollen diagram from Dziadowa Kłoda. 1 – peat, 2 – gytja, 3 – silt, 4 – sand

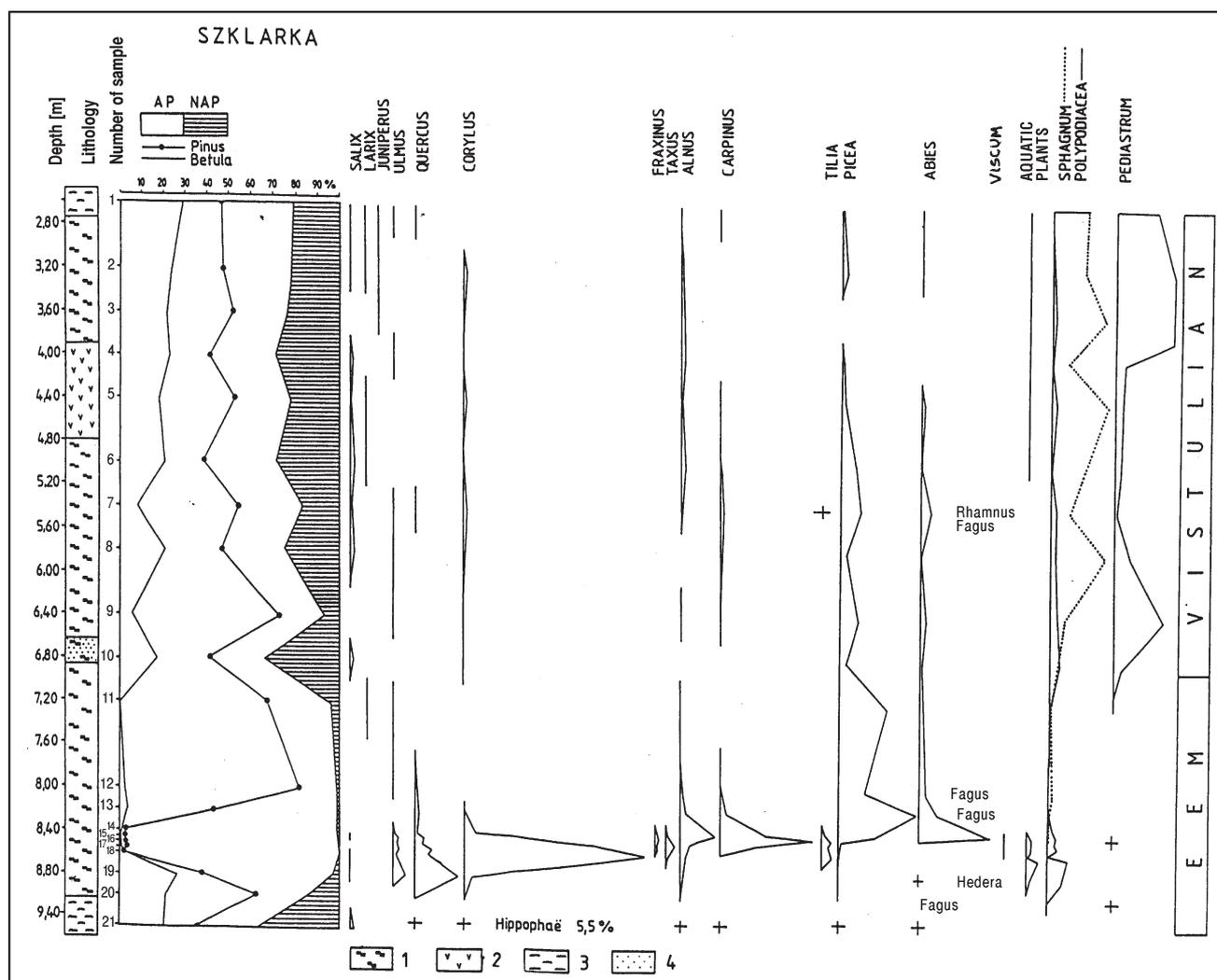


Fig. 5. Pollen diagram from Szklarka. 1 – peat, 2 – gyttja, 3 – silt, 4 – sand

*Pinus* and *Betula* pollen present. These deposits probably correspond to one or more of the interstadial oscillations of the Early Vistulian. The material did not allow a more detailed reconstruction of the history of the vegetation and climate because the samples had been taken from points too far apart in the profiles. Hence only preliminary results are available from the palynological studies of the Vistulian in the upper part of these two profiles.

The pollen succession of the new Eemian sites corresponds well with the regional picture of pollen succession of the Eemian Interglacial in Poland (Mamakowa 1989, Tobolski 1991, Kuszell 1997). An important feature of the interglacial sediments at Dziadowa Kłoda and Szklarka is the *Corylus* zone which contains sediments only 15 cm thick. In the Lechitów diagram the *Carpinus* zone is represented by 17 m thick sediments and as such is the first profile discovered in Poland to contain so high a sediment thickness in the *Carpinus* zone of the Eemian Interglacial.

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