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PALYNOLOGICAL INVESTIGATIONS OF THE PEAT-BOG NEAR JUSZKI VILLAGE, SOUTH OF KOŚCIERZYNA (KASZUBY LAKE DISTRICT), PRELIMINARY RESULTS

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ABSTRACT. This paper describes the very preliminary results of palynological investigations carried out at the peat-bog near Juszki village, south of Kościerzyna. This site is located in the area of an outwash plain beyond the Vistula lobe of the Pomeranian Stage. In the vicinity of the investigated area *Pinus* was the dominant tree species throughout the whole of the Holocene. Mixed deciduous forest developed only during the Holocene optimum, and, with the deterioration of habitat conditions was replaced by pine forest. A very similar situation is observed from other sites in the Kaszuby Lake District, although there are some differences, especially during the younger Holocene, mainly associated with different soil conditions.

KEY WORDS: Kaszuby Lake District, Holocene, palynological analysis, history of vegetation

INTRODUCTION

The Kaszuby Lake District (northern Poland) has always been a very interesting region for palynological investigations (Thomaszewski 1930, Wodziczko & Thomaszewski 1932, Paszewski 1934, Oszast 1957, Szafrański 1961, Kępczyński & Noryśkiewicz 1982, Miotk 1986).

The investigations, whose preliminary results are discussed in this paper, were carried out on sediments taken from the peat-bog near Juszki village, south of Kościerzyna. This site is located in the area of an outwash plain beyond the Vistula lobe of the Pomerania Stage (Fig. 1).

RESULTS

The organic sediment was 5.50 m thick and consisted of herbaceous peat, detritus gyttja and calcareous gyttja lying on sand. The bottom layer of detritus gyttja has been C-14 dated at 7280 ± 110 years BP.

The results of palynological analyses are presented on the simplified pollen diagram (Fig. 2) on which the following local pollen assemblage zones are distinguished:

Salix – NAP P.A.Z.

This zone coprises only one bottom sample of detritus gyttja lying on sand. The characteristic feature of this fragmentary zone is a large amount of NAP pollen taxa, mainly Gramineae, Cyperaceae, heliophilous plants (eg. *Helianthemum, Artemisia*) and *Salix,* providing evidence of the development of park tundra type open communities at this time.

This zone seems to be associated with the last part of the Late Glacial.

Pinus – Cyperaceae P.A.Z.

Heliophilous plants did not play such an important role as in the previous zone and they gradually disappeared. The older sample of this zone is characterized by the dominance of *Betula* while in the younger sample *Pinus* is more important. This may suggest the development of open birch – pine and later on pine forest at this time.

This zone is also associated with the Late Glacial period.

Betula – Poaceae P.A.Z.

Betula was the main tree in forest communities in this zone. At the same time a significant decrease of *Pinus* is observed. The first pollen grains of *Quercus* appeared and later on the continuous curve of *Corylus* started. The appearance of *Juniperus* is observed, but the pollen grains of *Typha latifolia* indicate progressive improvement of the climate. From the herbaceous plants the Poaceae played the most important role, indicating the development of grassland communities beyond the open birch – pine forest.

This zone corresponds with the end of the Late Gla-

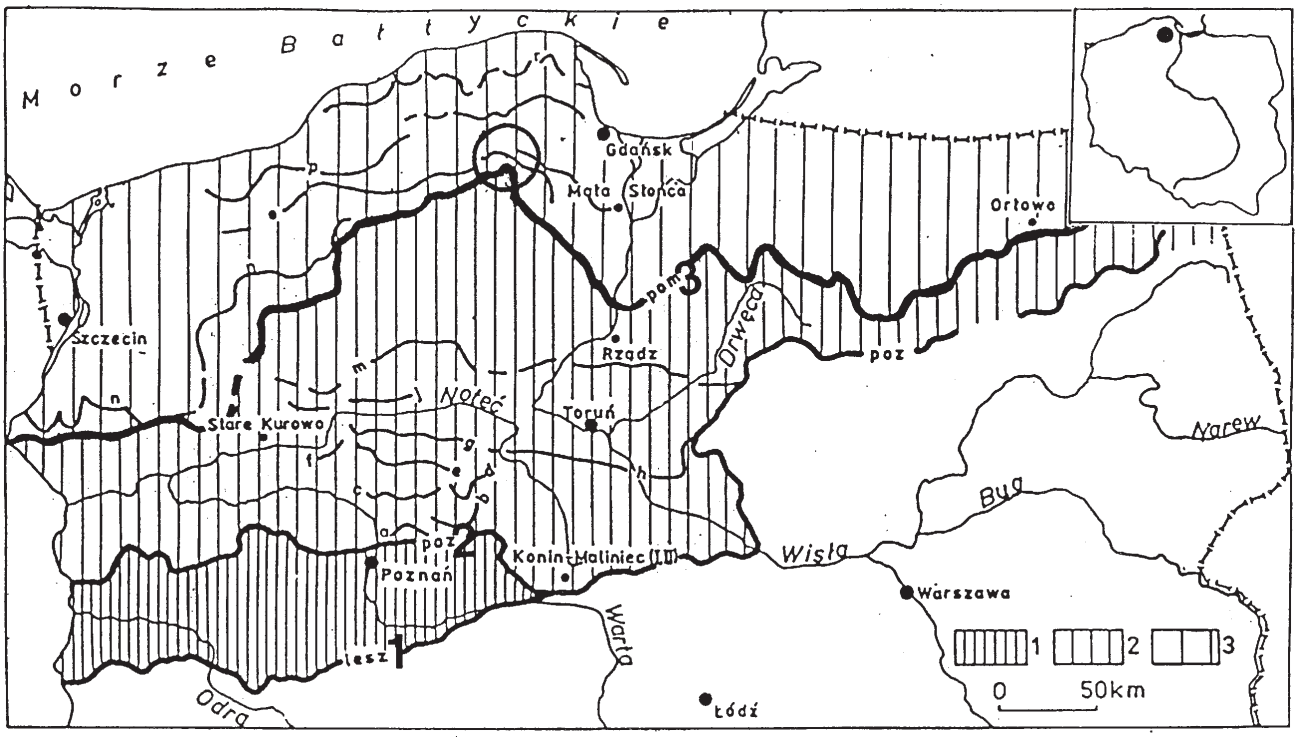

Fig. 1. The extent of particular Vistulian stages in Poland: 1 – Leszno Stage, 2 – Poznań Stage, 3 – Pomeranian Stage, (Mojski 1984). O – investigated area

cial and the beginning of the Holocene (Preboreal period).

***Corylus – Ulmus* P.A.Z.**

Corylus reaches its Holocene maximum. The gradual development of deciduous forest is confirmed by the appearance of *Ulmus, Alnus* and low percentages of *Quercus.*

This zone is associated with the Boreal period.

***Quercus – Ulmus – Tilia* P.A.Z.**

The increasing significance of deciduous trees, especially *Alnus, Quercus, Ulmus, Tilia, Corylus* and later on *Fraxinus,* is observed. The presence of pollen grains of *Viscum* and *Hedera* confirms good climatic conditions. *Pinus* and *Betula* still played a considerable role in the forest but compared with earlier zones their significance had clearly decreased.

The whole zone corresponds to the older part of the Atlantic period.

***Quercus – Alnus – Tilia* P.A.Z.**

Throughout the whole zone the clear dominance of *Alnus* is observed. *Quercus, Tilia* and *Fraxinus* still played an important role, but the significance of *Ulmus* gradually decreased. Single pollen grains of *Carpinus* and *Fagus* appeared.

This zone is associated with the younger part of the Atlantic period and the beginning of the Subboreal period.

***Pinus – Quercus* P.A.Z.**

A clear increase in the significance of *Pinus* is observed. *Quercus* still played an important role in forest communities, while the significance of other deciduous trees clearly decreased. The importance of *Picea* and, later on, *Carpinus* gradually increased. Some of these changes in the vegetation were caused by human activity, as is confirmed by the presence of pollen grains of human indicators.

This zone corresponds to the late Subboreal and early Subatlantic periods.

***Pinus* – NAP P.A.Z.**

Pinus was the absolutely dominant forest component. Other tree species disappeared almost completely.

This zone corresponds to the middle Subatlantic period.

The local pollen assemblage zones distinguished are associated with corresponding periods in order to compare with the older pollen diagrams from this area (Fig. 3).

A very small amount of *Carpinus* and as almost complete lack of *Fagus* in the upper part of the pollen dia-

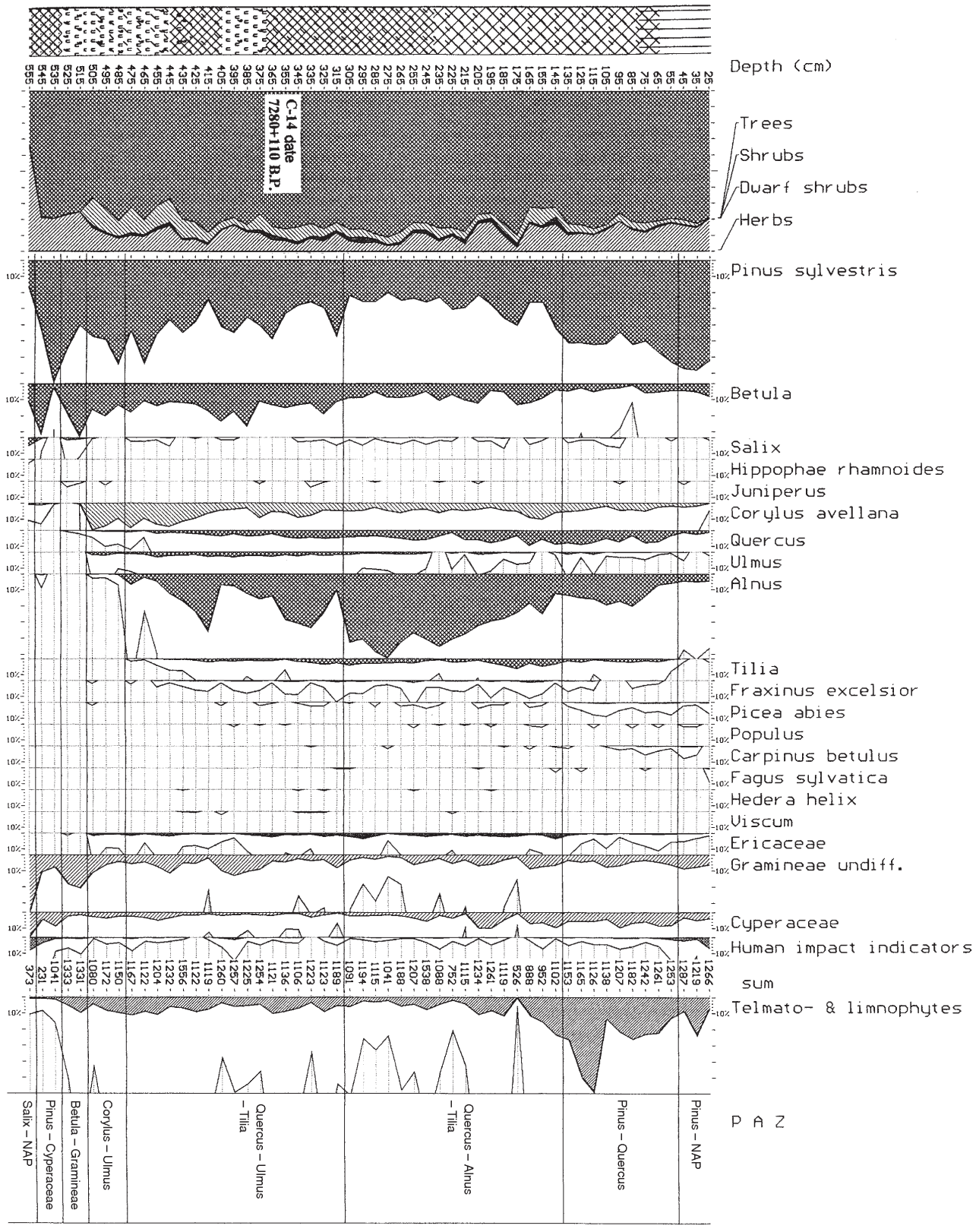

Fig. 2. Juszki – simplified pollen diagram

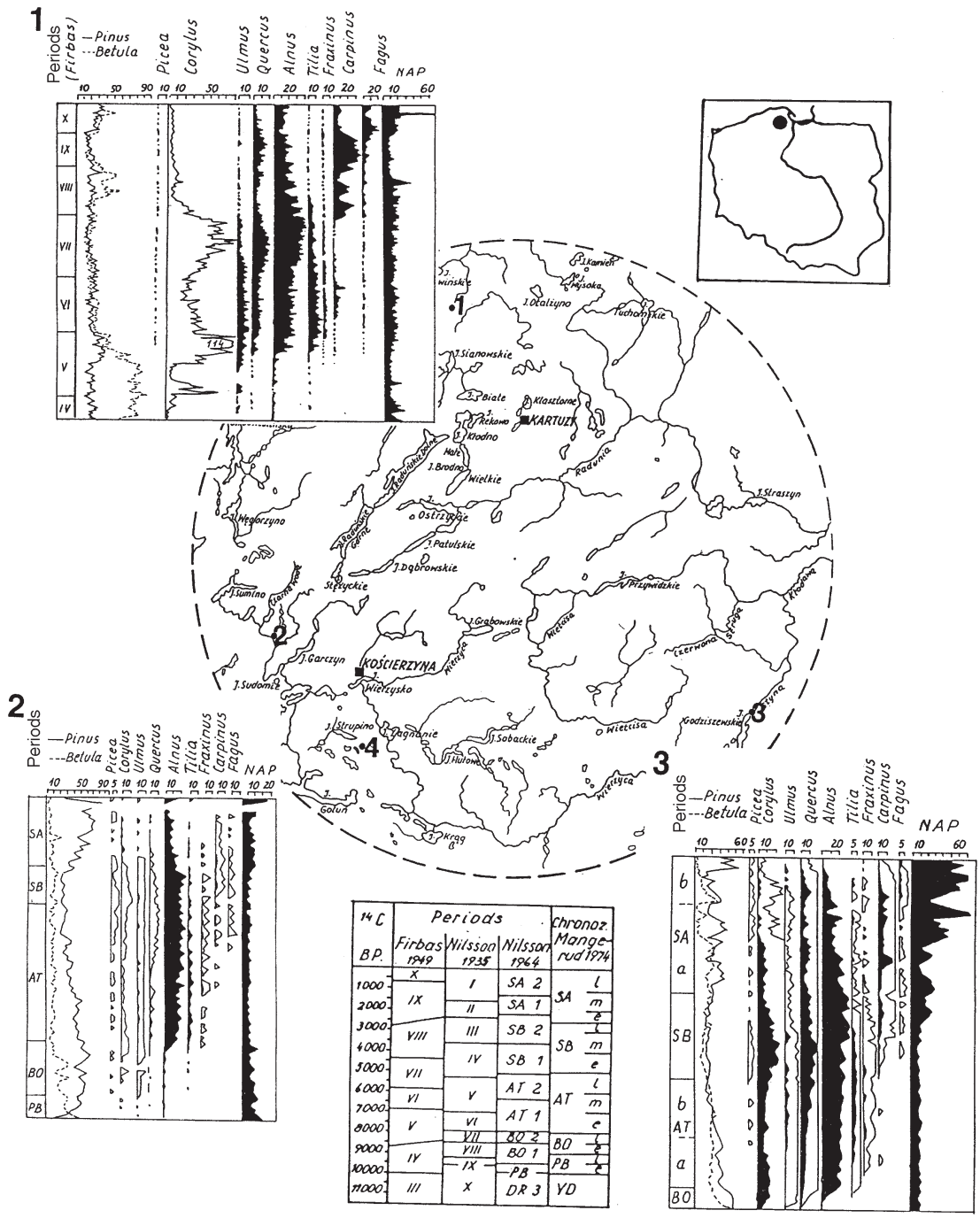

Fig. 3. Kaszuby Lake District – simplified pollen diagrams from the sites: 1 – Stążki (Szafrański 1961), 2 – Korne (Kępczyński & Noryśkiewicz 1982), 3 – Godziszewskie Lake (Miotk 1986), 4 – Juszki

gram (Fig. 2) could suggest that the younger part of the sediments is missing. It was for this reason that a core of sediments was taken from a second peat-bog positioned nearby. The very preliminary results of pollen analysis of these sediments has confirmed that *Carpinus* and *Fagus* played a more substantial role in the youngest history of the vegetation in this area, so the distinguished local P.A.Z., especially in the younger part of the sediments, should be changed.

In concluding the information about the history of the vegetation of this area we may state that the obvious dominant tree species throughout the Holocene was *Pinus,* for it found good conditions for growth on the poor sandy soils. *Pinus* formed forest accompanied at first by *Betula* and later by *Quercus*. During the Holocene optimum, in the more humid, fertile habitats, mixed deciduous forest with *Quercus, Ulmus, Tilia* and *Fraxinus* occurred. Alongside the development of mixed deciduous forest, the roles of *Corylus* and *Alnus* increased. Their occurrence was most probably limited to the river

banks and lake shores. With the deterioration of habitat conditions, deciduous forest was gradually replaced by pine forest, especially on the higher lying sandy areas.

Comparison of pollen diagrams from other sites in the Kaszuby Lake District (Fig. 3) shows that the history of the vegetation in this area was generally similar, although in fertile habitats nearby at Stążki (Szafrański 1961) and Godziszewskie Lake (Miotk 1986), deciduous forest played a more significant role than in the vicinity of Korne (Kępczyński & Noryśkiewicz 1982) and Juszki. It is obvious, especially during the younger periods of the Holocene when *Fagus,* and later on *Carpinus,* were in general the important trees in the forest communities, their occurrence on the poor, sandy soils near Korne (Kępczyński & Noryśkiewicz 1982) was minimal. This indicates that, in this area, the youngest history of the vegetation was mainly influenced by different soil conditions and the intensity of human impact.

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