

MALGORZATA LATAŁOWA

TYPE REGION P-t: BALTIC COASTAL ZONE

The Baltic Coastal Zone of Poland (P-t) (Fig. 1) is a region extending from the Odra estuary in the west as far as the Vistula delta in the east along the Baltic coastline but separated from it by the narrow strip of the Baltic Coast (P-u). Its southern

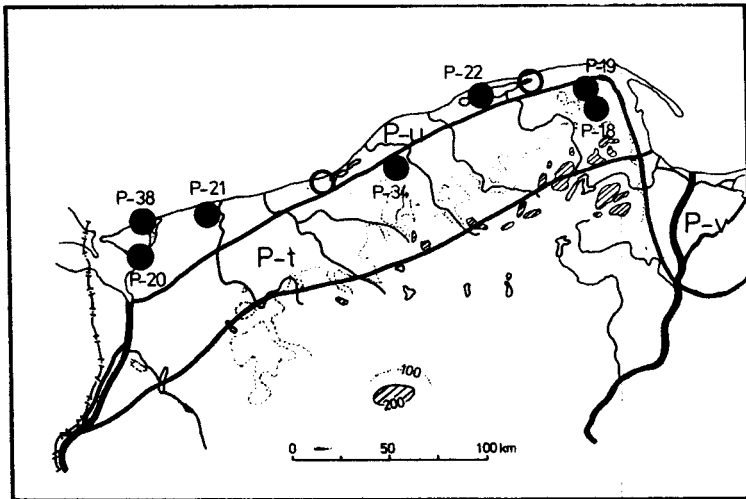


Fig. 1. The location of reference sites (black dots) and complementary sites (open dots) within P-t and P-u type regions

boundary is a belt of terminal moraine hills marking the position of the Pomeranian stage of the Vistulian glaciation. This synthesis is based on palaeobotanical data from two localities, one from the eastern and one from the central part of the region (Latałowa 1982a, b).

Altitude: 0—140 m a.s.l.

Climate: mean annual temp. 7°C, mean January —1°C, mean July 16,5°C, annual temperature amplitude 19°C; mean annual precipitation 600 mm, winds mainly from the west.

Geology: the area is covered with Quaternary formations; the ground moraine hills are mostly till and loamy sands while patches of outwash plains are of outwashed sands and gravels. The channels and valleys are filled with Holocene peats and river deposits.

Topography: the landscape of this area was shaped by the action of the Vistulian ice-sheet and its melt waters. The Pleistocene plateau was dissected by deep ice-marginal valleys; the hills are fairly flat-topped, as they were formed from flat or slightly undulating ground moraine.

Population: approximately 50—70 peoples km⁻², 60% in towns.

Vegetation: the natural vegetation of this area comprises mainly forests and peat-bogs. Its present-day state is largely a result of human activities. Beech is by far the most common tree in the forests. *Luzulo-Fagetum*, an acid beech forest, is the dominant community on the flat hills of ground moraine and on sand-clay formations; beech is often present together with oak in mixed acidophilous forests (*Fago-Quercetum*). On sandy soils mostly *Pino-Quercetum* phytocoenoses occur. Low moor communities are of prime importance in the peat-bog vegetation.

Soils: podzols, pseudopodzols, acid brown soils and bog soils.

Land use: forests 30—40%, agriculture 40%, pastures and meadows 10—15%; main crops — potatoes, rye, barley.

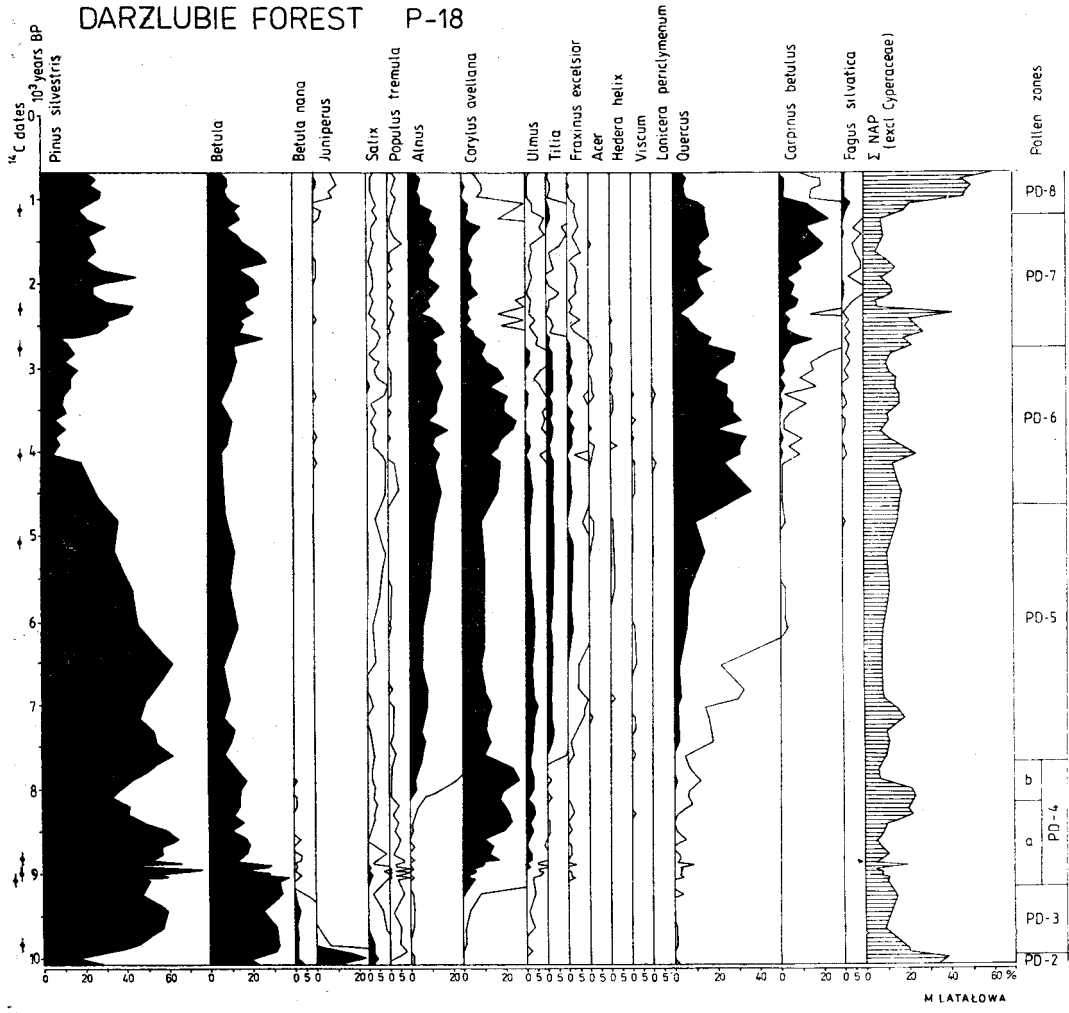


Fig. 2. Simplified pollen diagram from Darzlubie Forest reference site

Reference site „Darżlubie Forest”: 18°10'E, 54°42'N, elevation 40 m a.s.l., age range 10 000—? 800 B.P., peat-bog.

This site lies on an upland where the mosaic-like distribution of outwash plain sands and patches of till is responsible for the differentiation in soils and vegetation.

The sediments are characterized by a great diversity of macrofossil content and rate of accumulation. This means, that the interpretation of several parts of the diagram vary in their accuracy. The rate of accumulation was found to have been very low between 6700—4100 B.P. The data from this period are certainly incomplete.

7 „site pollen assemblage zones” have been described (Fig. 2):

- ? —10000 B.P., PD-2, *Juniperus-Pinus-Betula* paz
- 10000— 9100 B.P., PD-3, *Pinus-Betula* paz
- 9100— 7700 B.P., PD-4, *Corylus-Pinus* paz
- 7700— 4700 B.P., PD-5, *Tilia-Ulmus-Pinus* paz
- 4700— 2800 B.P., PD-6, *Quercus-Corylus* paz
- 2800— 1200 B.P., PD-7, *Quercus-Carpinus* paz
- 1200— ? PD-8, *Pinus-Fagus-Juniperus* paz

Main vegetational history patterns:

- at the turn of the Younger Dryas and Preboreal periods, the approaching polar range limit of the forest and an improvement in the climate is indicated by the culmination of the *Juniperus* pollen curve;
- the spread of the most important trees was dated as follows

empirical limit		rational limit
<i>Corylus</i>	9500	9100
<i>Ulmus</i>	9600	8900
<i>Alnus</i>	8500	8000
<i>Quercus</i>	8300	7500
<i>Tilia</i>	7600	7500
<i>Fraxinus</i>	7600	6300
<i>Carpinus</i>	4000	2800
<i>Fagus</i>	3100	1200

- pine was an important component of forests in the Preboreal, Boreal and Atlantic periods; its significance declined rapidly at the beginning of the Subboreal, when *Quercus* and *Corylus* expanded;
- forests composed mainly of species requiring more fertile habitats were completely destroyed about 2700 B.P.,
- the oak-hornbeam forests played an important role in the period between 2800 and 1200 B.P.;
- the oak-hornbeam woods were rapidly destroyed in the early Middle Ages; in that time beech spread.

Anthropogenic changes:

- five settlement phases were distinguished in the pollen diagram;
- the earliest traces of human activity come from the late Neolithic (4035±65 B.P.);
- the first grains of *Cerealia* can be dated at c. 3100 B.P. whereas the first pollen grain of *Secale* at 2400 B.P.;
- settlement advanced rapidly in this area towards the end of the Lusatian culture and during the East-Pomeranian culture;
- in the Migration Period the study area was affected by an economic recession;
- cereal cultivation did not increase in importance before the early Middle Ages.

Hydrological changes:

At this locality several fluctuation in the water level have been recorded. These fluctuations were undoubtedly favoured by the small area of the peat-bog, underlain

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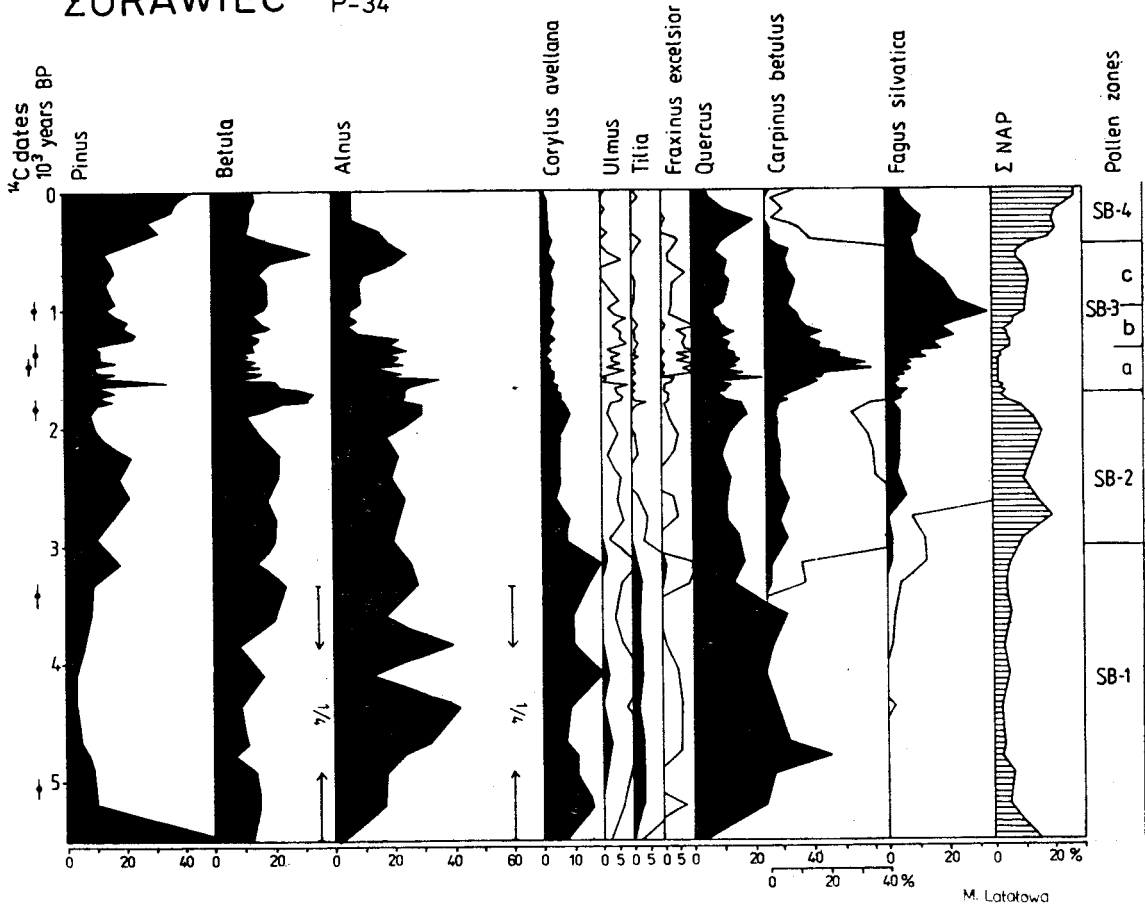


Fig. 3. Simplified pollen diagram from Słowiańskie Bagno-Zurawiec reference site

by permeable outwash plain sands. It seems that the hydrology of this bog was always very sensitive to the hydrological changes in the area.

The water level was found to have subsided at the beginning of the Preboreal period; the water level was high at the turn of the Younger Dryas and between 6800 and 3800 B.P.; a short lived water level increase is seen c. 2900 B.P. as a consequence of deforestation.

Reference site „Słowiańskie Bagno-Zurawiec”: 16°30'E, 54°25'N, elevation 33 m a.s.l., age range 5000—0, raised bog.

The peat-bog lies on an area of almost flat ground moraine (mean elevation 40 m a.s.l.) covered with heavy, impermeable clayey formations. It is a raised bog which came into existence on a local watershed. The initial phase in the developmental history of this bog was alder-birch swamp.

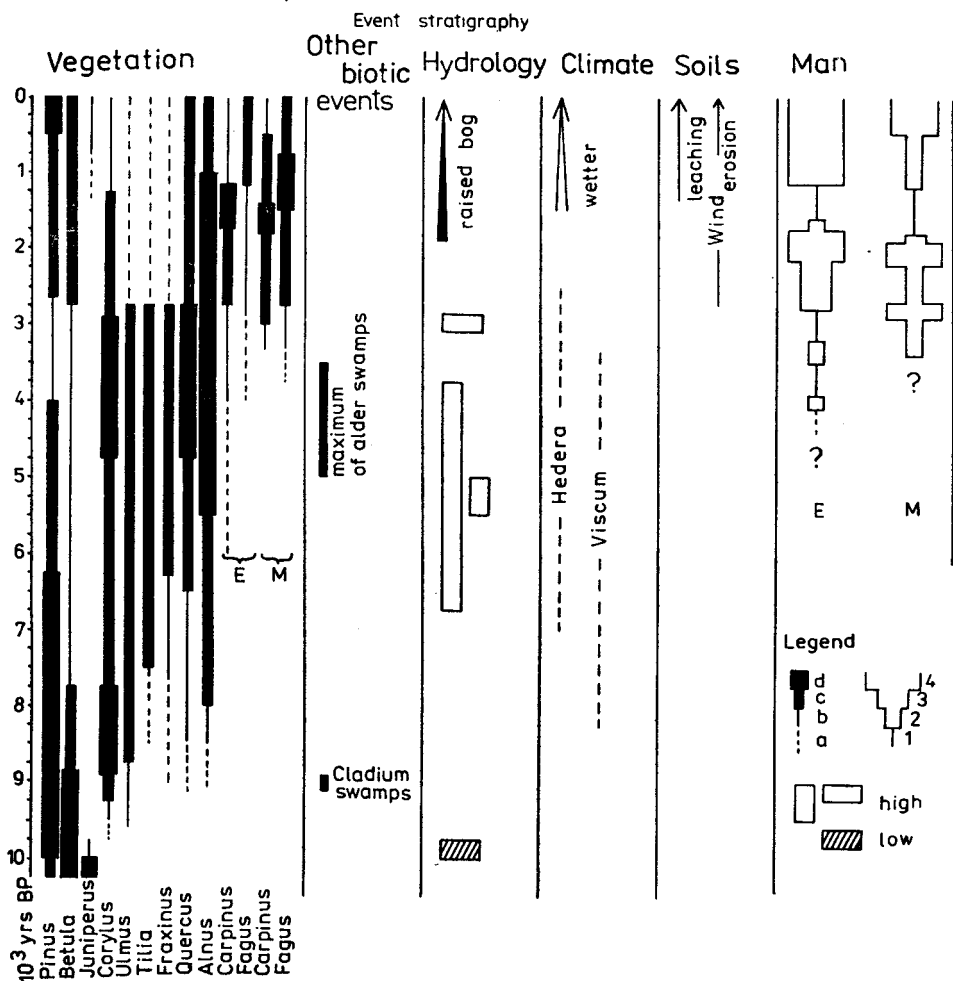
The top and bottom of the profile differ greatly as regards of the accumulation rate. It is due not only to the different types of peat-forming plant communities but also to the presence of an extensive charred layer dated at 3410±65 B.P. This part of the diagram (5000—2000 B.P.) has to be interpreted with care, as some of the sediments could have been burnt.

4 „site pollen assemblage zones” and 3 subzones have been described (Fig. 3):
 5000—3100 B.P., SB-1, *Alnus-Betula-Quercus-Tilia-Ulmus* paz
 3100—1800 B.P., SB-2, *Alnus-Betula-Pinus-Quercus-Plantago lanc.* paz
 1800— 500 B.P., SB-3, *Quercus-Carpinus-Fagus* paz
 1800—1400 B.P., SB-3a, *Carpinus* paz
 1400—1000 B.P., SB-3b, *Fagus* paz
 1000— 500 B.P., SB-3c, *Alnus* paz
 500— 0 B.P., SB-4, *Pinus-Juniperus-Poaceae-Cerealia* paz

Main vegetational history patterns:

- from c. 5000 to c. 3400 B.P. alder-birch swamp was of considerable importance in the study area;
- deciduous woodland on fertile habitats (*Ulmus*, *Tilia*, *Fraxinus*) were finally destroyed by man around 3100 B.P.;

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Fig. 4. Table „event stratigraphy”. Vegetation — spread of trees and some of shrubs: a — presence hypothetical or slight, b — present, c — expansion or important part, d — common. Man — human impact: 1 — slight, 2, 3, 4 — increasing settlement and deforestation

- hornbeam and beech began to spread c. 3100 B.P.;
- woodland regeneration during economic recession took place in two stages: hornbeam woodland was the first to spread (culmination c. 1500 B.P.), and this was followed by beech (culmination c. 1000 B.P.).

Anthropogenic changes:

- from c. 3400 to 1800 B.P., settlement adjacent to the peatbog was probably continuous with two culminations at c. 2800 and c. 2000 B.P.; during the first part of this phase animal husbandry was almost the only kind of farming practised; in the second, cultivation did become more important, but animal husbandry was probably still dominant;
- from c. 1800 to 1300 B.P. the study area was affected by an economic recession;
- between 1300 and 1200 B.P. a fairly small number of anthropogenic indicators appear in the diagram, but these may have been transported from elsewhere; deforestation in the neighbourhood of the peatbog commenced around 1000 B.P., but only c. 500 B.P. was there a significant expansion of cultivation.

Hydrological changes:

- the substantial rise in the water table which waterlogged the area and initiated the growth of swamps with alder and birch, took place around 5000 B.P.; these hydrological changes were probably connected with the third phase of the littorine transgression in the southern Baltic;
- around 1800 B.P., the local vegetation became transformed into a raised bog.

Unique patterns.

Both sites differ in the age range, thus the correlation can be made for the Younger Holocene only (Fig. 4). The most important problems are anthropogenic changes and the history of forest communities with hornbeam and beech.

1. In the vicinity of Żurawiec probably continuous settlement was during the period 3400 to 1800 B.P. with two culminations c. 2800 and 2000 B.P.; in Darżlubie Forest the settlement was uncontinuous in the same time, and anthropogenic phases were dated at the early and late Lusatian culture and Pomeranian culture.

2. The youngest deforestations began earlier in Darżlubie Forest (c. 1200 B.P.) than in vicinity of Żurawiec (1000 B.P.). In the latter area the intensification of cultivation was delayed (500 B.P.?).

3. The hornbeam appeared earlier in Darżlubie Forest and culminated there c. 1500—1200 B.P., whereas in the Żurawiec area it was only a short culmination c. 1500 B.P.

4. The fall of hornbeam in Darżlubie Forest was evidently connected with human influence, whereas on the Żurawiec site this correlation is not clear.

5. The beech appeared earlier in the middle part of the area and culminated in c. 1000 B.P., whereas in Darżlubie Forest it was beginning to spread in c. 1200 B.P.

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