

The Northwest European Pollen Flora

INTRODUCTION

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INTRODUCTION

In modern pollen analysis it has become clear that palaeoecological and phytogeographical interpretations are much enhanced by a detailed determination of pollen types. Frequently it proves impossible to key out the fossil types to the species level, but identification of the pollen grains to taxa of the lowest possible rank is highly desirable. Quaternary palynologists in Western Europe have a number of excellent pollen keys at their disposal, such as: (1) key to the NW European pollen types by Faegri and Iversen (1950, 1964); (2) *Leitfaden der Pollenbestimmung*, 1 by Beug (1961); and (3) pollen and spore key by Nilsson and Pragłowski (1963). These keys, however, are not always sufficiently detailed. On the other hand, keys treating special taxonomic or other groups are available, such as: (1) Chanda (1963) — Caryophyllaceae; (2) Pragłowski (1963) — Swedish trees; and (3) Cerceau-Larrival (1959) — Umbelliferae; etc. The number of these publications, however, is restricted and without continuity. In order to fill the gap we are planning to start publishing a "Northwest European Pollen Flora" on a regular basis.

We intend to study pollen grains of all seed plants and the spores of a number of important pteridophytes and bryophytes. The main goal of this project is to publish keys to the pollen types and to illustrate them by means of photographs for easy reference. Moreover, this Northwest European Pollen Flora will also include comprehensive descriptions of the pollen types and information on the pertinent literature. Much attention will be paid to variability in pollen populations, and — if possible — to occurrence in Quaternary deposits. The taxonomic position, evolution, and palaeogeography of the pollen types and taxa will be stressed to a lesser extent.

Information on the taxa will come from monographs and the most recent floras available from the specific area. Nomenclature follows the *Flora Europaea* except where stated to the contrary.

MATERIAL

In principle all the material to be used for the preparation of the pollen slides originates from a specific area in Europe shown on the map (Fig.1).

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Roughly it covers most of the area occupied by the Atlantic and general European plant-geographical elements. However, we shall not be too dogmatic in this respect.

Not all plants growing in Northwest Europe will be included in the pollen flora and the choice will be made arbitrarily. It was decided that garden plants and adventitious plants will be excluded from the flora. Introduced species are only listed if they have been established in a sizable part of the area. Neophytes, i.e. introduced plants which are completely naturalized, will certainly be studied as they often play an important role in the present vegetation (e.g. *Prunus serotina*, *Galinsoga parviflora*). Also some species not occurring in Northwest Europe today, but sometimes found in Quaternary deposits, such as *Myrtus communis*, *Tsuga*, *Brasenia*, etc., will be taken into consideration.

If a species is poorly represented in Northwest Europe, material from outside the area will be examined and also species occurring at the borders of the area and not distinctly confined to the Alpine region or the Mediterranean area are to be considered.

The source of the plant material is primarily the herbarium of the State University of Utrecht and, besides, the Rijksherbarium at Leiden. In order to avoid errors because of misidentifications of the herbarium specimens every specimen will be re-identified and cited.

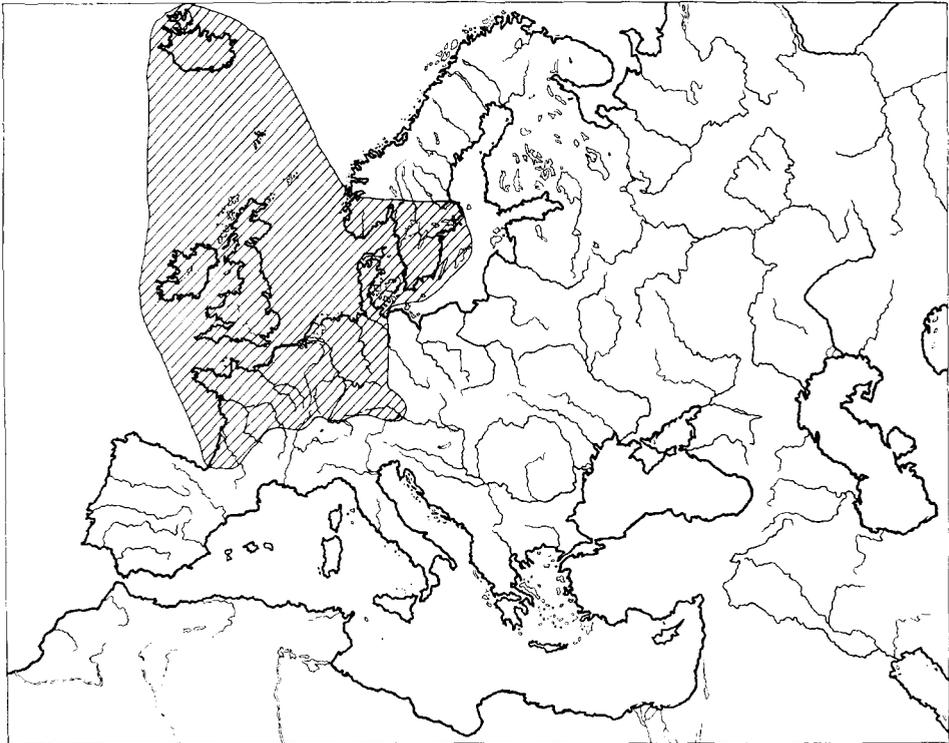


Fig.1. Map of the area dealt with in the Northwest European Pollen Flora (hatched).

Information regarding herbarium specimens in the publication will be restricted to specific name, author, collector's name and number, herbarium, and country. Other data are available in the files of the Laboratory of Palaeobotany and Palynology at Utrecht. At least two collections from different localities within the area will be examined, but usually more specimens will be studied in order to trace possible specific and intraspecific variability.

METHODS

Preparation method

Pollen grains will be prepared according to the acetolysis method as described by Reitsma (1969). The mounting is in: (a) glycerine jelly (Reitsma, 1969), as well as in (b) silicone oil (Andersen, 1960), because both mounting methods are in use with palynologists.

Terminology

For descriptions the terminology as suggested by Reitsma (1970) is used. If necessary, however, terms not mentioned or explained by Reitsma will be defined separately in the publications.

Descriptions

The pollen grains will be examined with Leitz microscopes and Leitz objectives. The sequence of pollen characteristics in the descriptions is always given in the same order. The following sequence of groups of features is used: *pollen class*, *apertures*, *exine*, *ornamentation*, *outlines*, and *measurements*. After a description a secondary key to pollen groups or species may follow and sometimes a brief comment can be added.

Measurements will be made both in preparations embedded in silicone oil and those mounted in glycerine jelly. They are often of relative value for a detailed identification of fossil pollen types (Reitsma, 1969) and only by a strict statistical treatment measurements may be of use for this purpose. We do not intend, however, to treat measurements statistically; they will be presented in a rather simple way by extremes only. They are considered to be of relative value.

Keys

The keys will differentiate between the species as much as possible with the use of the optics mentioned above, either on the level of pollen types or of pollen groups. In the publications a pollen type is defined as the lowest pollen-morphological entity, morphologically separated from other types by one or more distinct features. If the differences are less clear, pollen groups are involved.

A main key will lead to the pollen types. The features in this key may usually be observed with the aid of a 40X objective. Secondary keys may identify the smaller pollen groups or species, often with the aid of objectives of stronger magnification and resolution.

Photographs

Photographs illustrating the pollen types will be taken with a Leitz Ortholux microscope combined with an Orthomat camera. It is our intention to picture at least all pollen types with their characteristics and variation and, if possible, also the pollen groups and different species. Usually a number of SEM-microphotographs will be added.

Publications

The Flora is a publication under the auspices of the Royal Botanical Society of the Netherlands. Each section deals with a single family, and the series has its own pagination. These sections will not appear in a strict systematic order or in a regular sequence. Though the family treatments are in many cases of special interest to Quaternary palynologists, the authors express the hope that the Flora will prove its value to those interested in pollen morphology and plant taxonomy.

REFERENCES

- Andersen, S. T., 1960. Silicone oil as mounting medium for pollen grains. *Dan. Geol. Unders.*, IV (1): 1–24.
- Beug, H. J., 1961. *Leitfaden der Pollenbestimmung*, 1. Fischer, Stuttgart, 92 pp.
- Cerceau-Larrival, M. T., 1959. Clé de détermination d'Ombellifères de France et d'Afrique du Nord d'après leurs grains de pollen. *Pollen Spores*, 1: 145–190.
- Chanda, S., 1963. On the pollen morphology of some Scandinavian Caryophyllaceae. *Grana Palynol.*, 3: 67–89.
- Fægri, K. and Iversen, J., 1950. *Textbook of Modern Pollen Analysis*. Munksgaard, Copenhagen, 169 pp.
- Fægri, K. and Iversen, J., 1964. *Textbook of Pollen Analysis*. Munksgaard, Copenhagen, 2nd ed., 237 pp.
- Nilsson, S. and Pragłowski, J. R., 1963. Pollen and spore key. In: G. Erdtman, J. Pragłowski and S. Nilsson (Editors), *An Introduction to a Scandinavian Pollen Flora*, I. Almquist and Wiksell, Uppsala, 92 pp.
- Pragłowski, J. R., 1963. Notes on the pollen morphology of Swedish Trees and shrubs. In: G. Erdtman, J. R. Pragłowski and S. Nilsson (Editors), *An Introduction to a Scandinavian Pollen Flora*, II. Almquist and Wiksell, Uppsala, 89 pp.
- Reitsma, Tj., 1969. Size modifications of recent pollen grains under different treatments. *Rev. Palaeobot. Palynol.*, 9: 175–202.
- Reitsma, Tj., 1970. Suggestions towards unification of descriptive terminology of angiosperm pollen grains. *Rev. Palaeobot. Palynol.*, 10: 39–60.