

Allergenic pollen in the city of Porto (Portugal)

I. Abreu, H. Ribeiro*

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The knowledge of the aeropalynological content is of great interest for clinicians and patients affected by respiratory allergies (1).

These studies are very important for correlating the incidence of hay fever and asthma symptoms with the occurrence of high allergenic pollen concentrations in the air (2, 3). According to some reports, the incidence of patients affected with pollinosis has increased five times in Portugal over the last 30-years, with tendency to enlarge.

The atmospheric pollen concentration is variable for each region depending of its geographic characteristics because different climatic areas present different vegetation (4).

A study of the allergenic airborne pollen content in the atmosphere of Porto, the second largest city of Portugal, was performed using a Hirst volumetric trap (model Lanzoni VPPS-2000). Porto is situated in North-west Portugal, on the right bank of the Douro River. It has an annual rainfall of 1236 mm, irregularly distributed throughout the year, and an annual mean temperature of 14.4°C. Ornamental and nonornamental trees, shrubs and herbaceous species can be found in the surroundings of the sampling site; several of these species are allergenic pollen producers.

Annual distribution of the allergenic pollen content in the Porto atmosphere.

The pollen types considered in our study are included in the list of the Portuguese Aerobiology Network.

Throughout the year the distribution, of the total airborne pollen concentration (APC) presents several annual peaks because of the diversity of taxa present in Porto atmosphere and its different flowering seasons (Fig. 1). The most abundant pollen types in the atmosphere were Urticaceae with 34.6%, Poaceae with 11.6%, Pinaceae with 6.3% and *Platanus* with 7.3% of the total APC.

A total of 4325.6 pollen grains/m³ were sampled, mainly distributed during spring and early summer. The highest airborne pollen concentrations were found in the spring months, March (942.9 pollen grains), April (699.9 pollen grains) and May (742 pollen grains), with a total of 2384.8 pollen grains/m³ of air (55.1% of the total). These are the most problematical months for allergy patients. On the contrary, December was the month with the lowest pollen concentration (2.7% of total APC).

Urticaceae and grass pollen are present in the atmosphere throughout the year, representing 46% of total APC, the former more representative from March to May and the latter from May to August.

The pollination period of *Platanus* and Pinaceae started in March, persisting until early April. Also, during April, were observed the start of the *Quercus* and *Rumex* pollination period which continues throughout May for the first pollen type and until June for the second one.

Plantago pollen first appears in the Porto atmosphere in mid April, continuing throughout the entire spring-summer months. The beginning of the *Olea* pollination season was observed in May while the pollination season of *Castanea* was observed in June to July.

The pollen of Chenopodiaceae–Amaranthaceae was sampled during late summer until early autumn. In summer

the presence of Asteraceae pollen was also observed in the air.

During the winter season the presence in the atmosphere of Myrtaceae was recorded (November to January), also Cupressaceae (December to February), Betulaceae (January to February) and *Salix* (February) pollen. Betulaceae airborne pollen was also present during April because of the *Betula* flowering period.

This aerobiologic monitoring will be of great help for the establishment of flowering forecasts, namely to predict the maximum daily value of pollen that will be recorded in the coming pollen season. While also giving the most probable date on which this maximum concentration will be obtained and to help patients to plan their outdoor activities.

*Faculdade de Ciências
Departamento de Botânica
Rua do Campo Alegre
1191, 4150–181 Porto
Portugal
E-mail: inoronha@ibmc.up.pt

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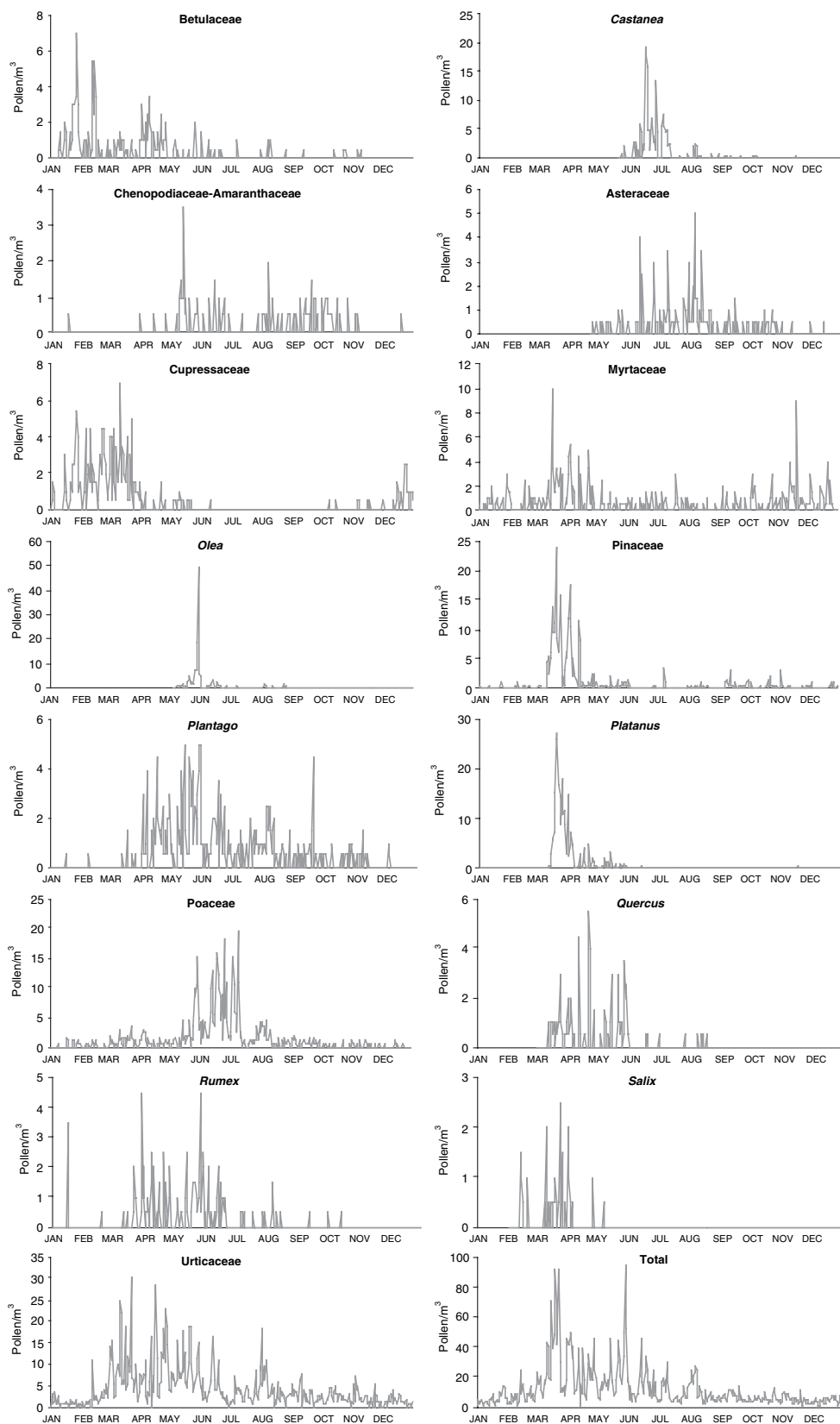


Figure 1. Annual distribution of the allergenic pollen in the Porto atmosphere.