

Gramineae hay fever, an aerobiological and clinical investigation in Palermo; Sicily

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SUMMARY. Epidemiological and aerobiological observations (1987;1989) have been carried out for three years in order to search the existing relationship between the Gramineae's daily pollen concentration in Palermo's atmosphere and the number of hay fever cases due to such pollen.

The aerobiological data were obtained with a 2000 VPPS volumetric sampler.

Clinical research was performed on 555 hay fever patients treated in our ambulatory over a three-year period (1987-1989).

These data, elaborated by a seven day running mean method and correlated with epidemiological data, evidenced that three of the pollen families in our territory are clinically important: Urticaceae, Parietaria prevailing among them, Gramineae and Oleaceae, Olea europaea prevailing among them.

The Gramineae are the second most important allergenic pollen (32,08% of all the pollinosis) whereas, as far as its concentration in the atmosphere is concerned; it ranks third following Parietaria and Oleaceae.

Key words: aerobiology, epidemiology, Gramineae.

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INTRODUCTION

Pollinosis is an acute exudative answer of the nasal and/or ocular and sometimes bronchial mucosa, due to the inhalation of anemophilous pollens of some kinds of plants, and it is found with seasonal periodicity in patients with specific hypersensitivity to pollen.

It is a pathology that affects a percentage ranging from 5 to 10% of the population in several countries (Serafini and Errigo, 1982; Dal Bo, 1982). Recent clinical and aerobiological studies have evidenced regional pollinosis characteristics (D'Amato, 1981; Macchia *et al.*, 1985; Bruno *et al.*, 1982; Pastorello *et al.*, 1985; Kumer, 1985; Cricchio *et al.*, 1986, 1988).

Among the pollen types of allergological interest in our territory, there are those of the Gramineae, present in all latitudes where the survival of phanerogamic flora is possible and adapts itself to extremely variable climatic conditions. The Gramineae, in country environments, vegetate in untilled fields, on slopes and on road edges.

The Gramineae family comprehends about 700 genera and about 10.000 species. Their pollen grains are monoporate, oval, heteropolar, with a circular equatorial diameter and an ellipsoidal meridian diameter and they measure 28 to 60 μm (Ciampolini and Cresti, 1981).

The allergic power of pollinic subfractions of different dimension has been recently highlighted ($\geq 10 \mu\text{m}$ to $\leq 0,6 \mu\text{m}$) (Spiekma *et al.*, 1990), which could explain the «bronchial» symptomatology that often is observed in patients with rhinitis during the period of intense pollination.

The aim of our study is to show, on the basis of epidemiological and aerobiological observations carried out over a period of three years (1987-89), the relationship existing between the concentration of the pollen grains of the Gramineae in Palermo's atmosphere and the number of pollinosis due to such pollen.

MATERIALS AND METHODS

The monitoring of airborne pollen has been performed daily with a Lanzoni 2000 VPPS volumetric sampler over a period of three years (1987-89). It has been placed on the roof of Palermo's Policlinic Medical Clinic, at about 25 meters above ground; the readings were accomplished by means of a microscope and expressed as daily average concentrations applying a statistical method (Cricchio *et al.*, 1986).

Successively, with the concentration data expressed as pollen grains per cube meter of air

(p/m^3) and thanks to a seven day running mean method allowing an evaluation of pollen trend which is less influenced by weather conditions graphical output are elaborated (Kumer and Mandrioli, 1981).

In parallel clinical investigation was conducted on a group of 555 people affected by pollinosis, examined by the Allergic Health Service Department of Palermo's Policlinic, over the period 1987-89. The patients were classified on the grounds of the anamnestic data, the results of the specific diagnostic tests (prick test and RAST), and the laboratory research supported by the objective examination of the patients.

RESULTS AND DISCUSSION

The airborne pollen of Gramineae monitored in Palermo over a period of three years is shown in Fig. 1.

The pollen is present, like in other regions, from the month of March to the month of October (Crimi, 1985; Macchia, 1985; Negrini and Vargiu, 1985). The maximum values 52,25 P/m^3 , 54,45 P/m^3 , 60,5 P/m^3 were reached respectively on June 4th 1987, May 23d 1988, May 25th 1989; low concentrations or isolated pollens were observed till the month of October, period in which the seasonal minima were registered.

The statistical data related to 555 patients affected by pollinosis, examined from 1987 to 1989 are shown in Tab. 1.

In particular for the Gramineae we had 177 sensitized cases (31,89%); of these 152 (85,88%) presented associations with other allergens (*Parietaria* 76,74%, *Olea* 33,49%, *Dermatophagoides* 23,11, Compositae 8,96%) and only 25 (14,12%) resulted monosensitized.

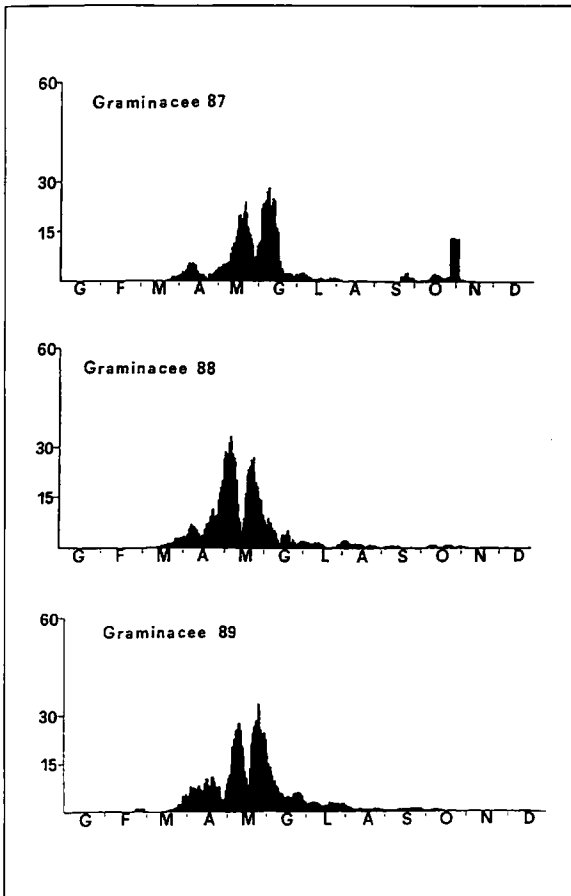


Figure 1. Trend of Gramineae atmospheric concentration in Palermo, obtained applying a 7-day-running mean method.

The average age of the multisensitized patients (30 ± 12 years) isn't statistically different from the group of monosensitized patients (29 ± 8 years). Statistically there is no significant difference between male and female polisensitized patients, whereas a difference of difficult interpretation between monosensitized males (71,43%) and females (28,57%) was recorded ($P < 0,01$). 50% of polisensitized patients presented bronco-asthmatic syndrome, sometimes associated with conjunctivitis and rhinitis (89,84%), 29,60% conjunctivitis and rhinitis and 20,39% isolated rhinitis.

The most frequent clinic form of monosensitized patients was rhinitis (64%), 36% of iso-

lated cases, 29% associated with conjunctivitis forms; bronchial asthma (46%) was isolated in 8% of the cases and associated with conjunctivitis and rhinitis in 38% of the cases.

Gramineae pollen in Sicily, like in other Italian regions, is the second most important allergenic pollens (31,89%) after the *Parietaria* (79,37%) (Tab. I) (Cricchio *et al.*, 1987; Crimi *et al.*, 1985; D'Amato, 1983; Romano, 1984) whereas as far as its concentration in the atmosphere is concerned it ranked after *Parietaria* and Oleaceae in the three years during which the monitoring was carried out (Tab. II).

Concluding in our territory it is evident that:

- The pollen families that are clinically important are Urticaceae (with *Parietaria* prevailing) Gramineae, Oleaceae (with *Olea europaea*) (Tab. I).

- Gramineae are frequently associated with other pollen families; the association with *Parietaria* (76,74%) is a characteristic of our territory.

- In agreement with data coming from various Italian regions (Ballero and Piu, 1986; Macchia, 1986; Negrini and Arobba, 1983) in our territory we had an increasing frequency of sensitization to Gramineae pollen namely of 16,63% in 1984 (Cricchio *et al.*, 1988), and of 25,20% in 1987 (Zambito *et al.*, 1989).

Table I. Distribution of sensitization among pollinotic patients observed over the years 1987-89.

Aeroallergens	Sensitized patients
Urticaceae (<i>Parietaria</i>)	440 (79.37%)
Gramineae	177 (31.89%)
Oleaceae (<i>Olea europaea</i>)	130 (23.42%)
Compositae	35 (6.30%)

Table II. Total pollen concentrations, p/m³.

Pollens	1987	1988	1989
Urticaceae	25.059	70.347	42.046
Gramineae	635	1.129	1.201
Oleaceae	941	1.194	2.844
Compositae	38.5	97.35	204

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