

Ragweed sensitization in Europe – GA²LEN study suggests increasing prevalence¹

G. J. Burbach, L. M. Heinzerling, C. Röhnelt, K.-C. Bergmann, H. Behrendt, T. Zuberbier*

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Common ragweed (*Ambrosia artemisiifolia*) is a highly allergenic plant species and the prime cause of allergic rhinitis in North America. Originally, in Europe, only Hungary has shown considerable spreading of *Ambrosia* since the early 1990s, when the abandonment of communist-style collective agriculture resulted in large uncultivated fields with concurrent ragweed invasion. So far, ragweed sensitizations in other European countries were reported to be of only minor importance with the highest rates registered in particular regions of Italy (Turin), the Netherlands (Geleen) and the UK (Norwich, 1).

Here, results of a pan-European study from 16 centres in 13 European countries (GA²LEN; 01/2006–07/2007) are presented. Data on immediate sensitization were collected by standard prick testing. The study population consisted of routine out-patients with allergic symptoms who presented to one of the study centres. Median age of the 2026 participants was 35 years (25th: 22 years and 75th: 50 years), gender distribution comprised 57.9% female and 42.1% male

participants. In total, extracts for 18 inhalant allergens including *Ambrosia artemisiifolia* (ALK-Abelló, Hamburg, Germany) were tested on the volar forearm. Results were recorded after 15 min and regarded positive if the wheal diameter calculated (largest + perpendicular diameter of the wheal/2) was ≥ 3 mm. Statistical analysis was performed with STATA 9.0 software (StataCorp LP, College Station, TX, USA). Data were standardized with regard to age and gender. As of biases of either frequency or age distribution, Belgium, Switzerland and Greece were omitted in the country-specific analysis to achieve maximum comparability of the data.

Results are summarized in Fig. 1. Interestingly, the prevalence for ragweed sensitization was above 2.5% in all European countries except Finland (2.4%). Previously, 2.5% had been suggested as a cut-off for high prevalence (1). Surprisingly, Denmark was most heavily affected with a prevalence of 19.8%. While Hungary was expected to show a high prevalence of ragweed sensitization, central and western European countries unexpectedly demonstrated high sensitization rates. Here, the Netherlands and

Germany showed the highest prevalences with 15.2% and 14.2% respectively. Interestingly, of all *Ambrosia*-sensitized patients, 23.7% showed asthma symptoms.

In summary, the increase of ragweed sensitization prevalences in Europe demonstrated in this study indicates the spreading of *Ambrosia* pollen and, thus, the dissemination of *Ambrosia* plants throughout Europe. As long distance travel of *Ambrosia* is now widely acknowledged (2, 3), eradication programmes limited to particular countries will not succeed and pan-European action is needed. Consistently, we call for a pan-European surveillance system to monitor trends in sensitization patterns. In light of apparent climate changes, further changes in regional vegetation patterns can be expected and only sound pan-European epidemiological databases will allow concerted counter-measures.

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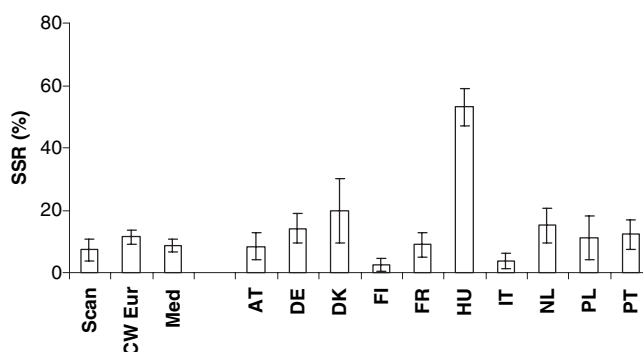


Figure 1. Standardized sensitization rates for *Ambrosia* (SSR, $n = 2026$) by region [Scandinavia (Scan), Central/Western Europe (CW Eur), Mediterranean (Med)] and country. The following countries were subsumed in regions: Denmark (DK) and Finland (FI): Scandinavia; Austria (AT), Belgium, Germany (DE), Netherlands (NL) and Switzerland: Central and Western Europe; France (FR), Greece (GR), Italy (IT), Portugal (PT): Mediterranean Countries. The Eastern European countries Poland (PL) and Hungary (HU) were analysed separately. A total of 95% confidence intervals are depicted as error bars.

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*Department of Dermatology and Allergy
Charité Universitätsmedizin Berlin
Charitéplatz 1
D-10117 Berlin
Germany
Tel: +49 30 450 518135
Fax: +49 30 450 518919
E-mail: torsten.zuberbier@charite.de

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References

1. Bousquet PJ, Chinn S, Janson C, Kogevinas M, Burney P, Jarvis D. Geographical variation in the prevalence of positive skin tests to environmental aeroallergens in the European Community Respiratory Health Survey I. *Allergy* 2007;**62**:301–309.
2. Cecchi L, Morabito M, Paola DM, Crisci A, Onorari M, Orlandini S. Long distance transport of ragweed pollen as a potential cause of allergy in central Italy. *Ann Allergy Asthma Immunol* 2006;**96**:86–91. Erratum in: *Ann Allergy Asthma Immunol* 2006;**96**:504.
3. D'Amato G, Cecchi L, Bonini S, Nunes C, Annesi-Maesano I, Behrendt H et al. Allergenic pollen and pollen allergy in Europe. *Allergy* 2007;**62**:976–990.