

w230 nAmb a 1

nAmb a 1 from Ragweed (*Ambrosia elatior*)

Clinical Utility

Ragweed which originates from North America is now spreading across Europe. Since Ragweed and Mugwort have nearly identical flowering periods, cross-reactivity between them might become an important issue also for European weed allergic patients. Amb a 1 from Ragweed is a specific marker allergen suitable for discriminating between genuine Ragweed sensitization and cross-reactivity (1).

Allergen Description

Ragweed refers to a group of approximately 40 species of annual weed plants belonging to the *Asteraceae* (*Compositae*) family. The most common species is Short ragweed which is native to North America, but can also be found in Asia and Europe.

Amb a 1 is a 38 kDa protein belonging to the pectate lyase group of proteins and is also known as Antigen E. The protein appears to be a collection of very closely related isoforms with a very high identity among them (2-4).

Pectate lyase is an extracellular enzyme and is induced by pectin. It is involved in *e.g.* soft rotting of plant tissue.

Amb a 1 is the most important Ragweed allergen, since 95% of Ragweed-sensitive individuals react to it in skin tests and show high serum IgE antibody levels (5, 6).

Clinical Experience

Ragweed is an important allergenic weed, causing allergic rhinitis, asthma and conjunctivitis in sensitized individuals. Ragweed pollen represents the major source of allergenic pollen in the United States, with a prevalence of about 50% in atopic individuals and in Europe Ragweed allergy is rapidly increasing (7).

The efficacy of Ragweed pollen in exacerbating allergic symptoms could be due to the Ragweed pollen endopeptidase, which may be involved in the inactivation of regulatory neuropeptides during pollen-initiated allergic reactions (8). Studies have also shown that complement activation induced by the allergen may enhance the clinical symptoms of Ragweed allergy (9, 10).



Cross-Reactivity

Common ragweed is expected to be cross-reactive with other members of the same family, including *A. psilostachya* (Western ragweed, w2), *A. trifida* (Giant ragweed, w3), *A. acanthicarpa* (False ragweed, w4) and *A. maritima*.

Sensitization to Amb a 1, a pectate lyase, may result in cross-reactivity with other pectate lysase-containing plants where a high degree of homology occurs (12). However Amb a 1 is considered to be a good marker for specific ragweed sensitization.

Phl p 4 from Timothy grass pollen has been reported to have significant sequence similarities with Amb a 1, and this is confirmed by cross-reactivity of monoclonal antibodies and patients' IgE. This protein should therefore be considered as a cross-reactive component in grass and weed pollen allergy (11).

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