

# Molecular allergy explorer test based on new state-of-the-art multiplex nano-bead technology in Asteraceae-hazelnut association

## Asteraceae pollen-food syndromes and associations

Syndrome or association	Allergen components possible/relevant
Mugwort-celery-spice syndrome	Art v 4 profilin (CR Api g 4, Dau c 4); Art v 60 kDa (homologue to Api g 5)
Mugwort-peach association	Art v 4 profilin (CR Pru p 4); Art v 3 LTP (CR Pru p 3)
Mugwort-chamomile association	Art v 1 defensin; HMW allergens; Mat c 1 (Bet v 1 homologue)
Mugwort-sunflower association	Hel a 4 (Art v 1-like allergen); Hel a 3 LTP (homologue Art v 3 LTP)
Mugwort-mustard syndrome	Art v 3 LTP (CR Sin a 3); Art v 4 profilin (CR Sin a 4); Art v 60 kDa
Ragweed-melon-banana association	Amb a 6 LTP (CR Cuc m LTP); Amb a 8 profilin (CR Cuc m 2, Mus xp 1)
Asteraceae-lychee association	Amb a 8, Art v 4 profilins (CR Lit c 1)

[Popescu FD. Cross-reactivity between aeroallergens and food allergens. World J Methodol. 2015; 5(2): 31-50]

## Molecular serum biomarkers for genuine sensitization to Asteraceae weed pollen

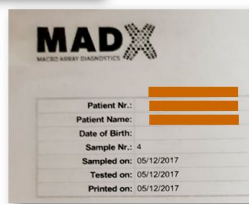
detected as specific IgE to

- ragweed pectate lyase **Amb a 1** (46.37 kU<sub>A</sub>/L) and
- mugwort defensin **Art v 1** (28.34 kU<sub>A</sub>/L).

Name	Allergen	E/M(*)	Function	kU <sub>A</sub> /L
<b>Weed Pollen</b>				
Common Pigweed	Amb a 1	E		46.37
Ragweed	Amb a 1	M	Pectate Lyase	46.37
Ragweed	Amb a 4	M	Plant Defensin	1.75
Ragweed	Amb a	E		0.00
Mugwort	Art v 1	M	Plant Defensin	28.34
Mugwort	Art v 3	M	nsLTP	0.00
Mugwort	Art v	E		0.00

No sensitizations were found (<0.3 kU<sub>A</sub>/L) to other region relevant pollen-specific molecular allergens from

- weeds (Pla l 1), grasses (Phl p 1, Phl p 5.0101),
  - trees (Bet v 1, Cor a 1.0103, Fra e 1, Pla a 1)
- or to cross-reactive
- polcalcins and profilins (Phl p 7, Phl p 12, Bet v 2).



## Additional relevant in vivo allergy tests

positive skin prick tests to

- commercial extracts of
  - hazelnuts** (3 mm diameter wheel)
  - Helianthus annuus** pollen (8 mm wheel)
  - Calendula officinalis flores**
- pulvis suspension 30 mg/mL (4 mm wheel)



## Authors

**Florin-Dan Popescu<sup>1,2</sup>, Mariana Vieru<sup>1,2</sup>**  
**Carmen Saviana Ganea<sup>2</sup>**

<sup>1</sup> *Carol Davila* University of Medicine and Pharmacy, Department of Allergology, Bucharest, Romania

<sup>2</sup> *Nicolae Malaxa* Clinical Hospital, Department of Allergology and Clinical Immunology, Bucharest, Romania

No conflict of interest regarding this presentation to declare  
 Written informed consent obtained from the patient for presentation and publication

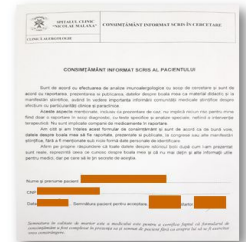
## Case report and methodology

28-year-old female patient from Southern Romania with fall **seasonal allergic rhinoconjunctivitis**, history of two episodes of **anaphylaxis** to ingestion of **hazelnuts** and **sunflower seeds**, and **contact angioedema** to **pot marigold**.

**Molecular allergy diagnosis** performed using a new *in vitro* **multiplex allergy explorer test** allowing simultaneous measurement of

- serum specific IgE against a plethora (282) of 156 allergen extracts, 126 molecular allergens,
- based on **nano-bead technology**, with
- immunoassay** protocol integrating powerful CCD inhibitor during serum incubation
- results quantification based on **colorimetric image acquisition**

MacroArray Diagnostics, Vienna, Austria



## Molecular allergy profile in the association case report

High serum specific IgE levels to **non-specific lipid transfer proteins** (nsLTP)

- hazelnut **Cor a 8** (1.1 kU<sub>A</sub>/L) and mugwort pollen **Art v 3** (27.07 kU<sub>A</sub>/L),
- a similar LTP being also present in sunflower seeds (Hel a 3).

Nuts	Cor a 8	M	nsLTP
Hazelnut	1.10		

- Specific IgE to ragweed pollen **Amb a 4** was detected (1.75 kU<sub>A</sub>/L), this Art v 1-like defensin being homologous with sunflower Hel a 4 defensin.
- Amb a 1-like **Hel a 6** present in sunflower pollen must be mentioned, because pollen contamination of sunflower seeds was not excluded.
- No sensitization was found to **hazelnut storage proteins** (<0.3 kU<sub>A</sub>/L):  
 11S globulin Cor a 9, 7/8S globulin Cor a 11 and 2S albumin Cor a 14.

## Conclusion

We propose the use of a new allergy term:

### **Asteraceae-hazelnut association**

to describe the cross-reactive nsLTP IgE-mediated *Asteraceae* weed pollinosis-associated hazelnut food allergy,

and we suggest that multiplex

**ALLERGY EXPLORER** test assesses its molecular diagnosis

ALLERGY EXPLORER

is the first *in vitro* multiplex allergy test allowing simultaneous measurement of total IgE (tIgE) and specific IgE (sIgE) against a plethora of allergen extracts and molecular allergens.



ALEX  
 ALLERGY EXPLORER