

Table S1. Example of an ALEX test result summary.

Pollen	Grass Pollen	3	Cross-Reactive Allergen Families			
	Tree Pollen	2	Polcalcin		0	
	Weed Pollen	0	Profilin		2	
Mites	House Dust Mites and Storage Mites	2	PR-10		2	
Microorganisms	Fungal Spores and Yeast	0	Ole e 1 Family		2	
Plant-Based Food	Legumes	1	LTPs		0	
	Grain	0	Storage Proteins		0	
	Spices	0	Lipocalins		0	
	Fruits	1	NPC2		0	
	Vegetables and mushrooms	0	Serum albumin		0	
	Nuts and Seeds	1	Parvalbumin		0	
Animal-Derived Food	Milk	0	Tropomyosin		0	
	Egg	0	CCD		0	
	Fish and Seafood	0				
	Meat	0				
Insects and Venoms	Bee, Wasp	0				
	Cockroach	0				
Epithelial Tissues of Animals	Pets	0				
	Animals	0				
Others	Latex	2				
	Ficus an Hops	0				
	CCD	0				
Total IgE (kU/L)						68
Highest measured IgE concentration per allergen group						
0	1	2	3	4		
<0.3 kUA/L	0.3–1 kUA/L	1–5 kUA/L	5–15 kUA/L	>15 kUA/L		
Negative or uncertain	Low IgE level	Moderate IgE level	High IgE level	Very high IgE level		

Table S2. *Specific IgEs in all overwinterers:* Due to no specific IgEs, the following categories were deleted to increase clarity: grain, spices, milk, egg, cockroach, animals, ficus, and hops, CCD; Deleted items for cross-reactive allergen families: polcalcin, storage proteins, parvalbumin, CCD. color explanation: no color/rose (0) = <0.3 kUA/L (negative or uncertain), yellow (1) = 0.3–1 kUA/L (low IgE level), orange (2) = 1–5 kUA/L (moderate IgE level), red (3) = 5–15 kUA/L (high IgE level), dark red (4) = >15 kUA/L (Very high IgE level). No color and rose lines show different subjects. Grey columns show separations of test clusters.

Participant	Pollen			Mites	Microorganisms	Plant-Based Food				Animal-Derived food		Insects & Venoms	Epithelial Tissues of Animals	Others	Cross-reactive Allergen Families										Total IgE	History of Allergy	Type of Allergy, symptoms and development
	Grass Pollen	Tree Pollen	Weed	House Dust Mites & Storage Mites	Fungal Spores & Yeast	Legumes	Fruits	Vegetables & mushrooms	Nuts & Seeds	Fish & Seafood	Meat	Bee, Wasp	Pets	Latex	Profilin	PR-10	Ole e 1 Family	LTPs	Lipocalins	NPC2	Serum albumin	Tropomyosin	(kU/L)				
Con2_pre	3	0	1	3	4	0	0	0	0	0	0	0	1	0	0	0	1	0	0	3	0	0	94	no			
Con2_Sept	3	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	179				
Con2_post	3	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	441				
Con3_pre	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	no			
Con3_Sept	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	13				
Con3_post	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8				
Con4_pre	4	3	0	2	0	1	0	1	1	0	0	2	0	2	2	3	2	0	0	0	0	0	223	yes	hay fever, reactions to insect bites, younger age allergy towards cats/dogs, food reactions		
Con4_Sept	4	2	0	2	0	1	0	1	1	0	0	1	0	0	2	2	2	0	0	0	0	0	324				
Con4_post	3	2	0	2	0	1	1	0	1	0	0	1	0	2	2	2	2	0	0	0	0	0	68		afterwards, same reactions as before, but more hayfever		
Con5_pre	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	20	unknown			
Con5_Sept	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	92				
Con5_post	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	13				
Con6_pre	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	no			
Con6_Sept	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80				
Con6_post	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15				
Con8_pre	4	0	2	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	294	unknown			
Con8_Sept	4	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	525				
Con8_post	missing																						missing				

Con9_pre	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	193	yes	hay fever (pollen from olive trees)
Con9_Sept	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	124		
Con9_post	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	63		no hay fever after return
Con10_pre	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	36	unknown	
Con10_Sept	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	108		
Con10_post	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20		
Con13_pre	3	3	2	4	2	3	3	1	2	0	1	0	0	0	0	0	0	3	0	4	0	0	0	110	unknown	
Con13_Sept	3	3	1	4	2	3	3	1	1	0	0	0	0	0	0	0	0	3	0	4	0	0	0	240		
Con13_post	2	3	2	4	2	3	3	1	1	0	0	0	0	0	0	0	0	3	0	4	0	0	0	99		
Con14_pre	0	3	0	4	0	0	0	0	0	1	0	2	0	0	0	2	0	0	0	4	0	1	0	405	unknown	
Con14_Sept	0	3	0	4	0	0	0	0	0	1	0	1	0	0	0	2	0	0	0	4	0	1	0	1335		
Con14_post	0	3	0	4	0	0	1	0	0	0	1	2	0	0	0	2	0	0	0	4	0	0	0	618		
Con15_pre	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	6	yes	hay fever (varying with years), dust mites
Con15_Sept	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4		
Con15_post	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	5		worse hay fever after return
Con17_pre	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	34	no	
Con17_Sept	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51		
Con17_post	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33		
Con21_pre	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	26	yes afterwards	
Con21_Sept	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	31		
Con21_post	1	2	0	0	0	0	0	0	0	0	1	0	3	0	0	0	2	0	2	0	3	0	0	176		newly experienced hay fever directly after return for a couple of days
Con23_pre	1	2	2	0	0	0	0	0	0	0	2	0	4	0	0	1	2	0	2	0	4	0	0	719	yes	cats, dogs, rats -> wheezing
Con23_Sept	missing																							missing		
Con23_post	1	2	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	2	0	3	0	0	521		new allergic reactions to grass/flowers -> hay fever, wheezing, throat swelling
Neu1_pre	0	3	1	0	0	0	2	0	1	0	0	2	0	0	0	3	0	2	0	0	0	0	0	83	unknown	

Neu1_Sept	0	2	0	0	0	0	2	0	1	0	0	2	0	0		0	2	0	2	0	0	0	0	0	67		
Neu1_post	0	2	0	0	0	0	1	0	1	0	0	1	0	0		0	2	0	1	0	0	0	0	34			
Neu2_pre	0	0	0	0	0	0	0	0	0	0	0	1	0	0		0	0	0	0	0	0	0	0	30	unknown		
Neu2_Sept	1	0	0	0	0	0	0	0	0	0	0	2	0	0		0	0	0	0	0	0	0	0	138			
Neu2_post	0	0	0	0	0	0	0	0	0	0	0	1	0	0		0	0	0	0	0	0	0	0	13			
Neu3_pre	0	0	0	0	0	0	0	0	0	0	0	2	0	0		0	0	0	0	0	0	0	0	5	unknown		
Neu3_Sept	0	0	0	0	0	0	0	0	0	0	0	1	0	0		0	0	0	0	0	0	0	0	4			
Neu3_post	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	4			
Neu4_pre	0	2	0	0	0	0	0	0	1	0	0	0	1	0		0	2	0	0	0	0	0	0	41	yes	grass and rabbit allergy	
Neu4_Sept	0	2	0	0	0	0	0	0	0	0	0	0	1	0		0	2	0	0	0	0	0	0	45			
Neu4_post	0	2	0	0	0	0	0	0	0	0	0	0	1	0		0	2	0	0	0	0	0	0	15			
Neu5_pre	4	3	0	0	0	0	0	0	1	0	0	0	0	0		2	3	0	0	0	0	0	0	523	unknown		
Neu5_Sept	4	2	0	0	0	0	1	0	0	0	0	1	0	0		1	2	0	0	0	0	0	0	368			
Neu5_post	4	2	0	0	0	0	0	0	0	0	0	1	0	0		0	2	0	0	0	0	0	0	61			
Neu6_pre	0	0	0	0	0	0	0	0	0	2	0	0	0	0		0	0	0	0	0	0	0	0	15	no		
Neu6_Sept	0	0	0	0	0	0	1	0	0	2	0	1	0	0		0	0	0	0	0	0	0	0	11			
Neu6_post	0	0	0	0	0	0	0	0	0	2	0	0	0	0		0	0	0	0	0	0	0	0	7			
Neu8_pre	0	0	0	0	0	0	0	0	0	2	0	0	0	0		0	0	0	0	0	0	0	0	6	unknown		
Neu8_Sept	0	0	0	0	0	0	0	0	0	1	0	0	0	0		0	0	0	0	0	0	0	0	11			
Neu8_post	0	0	0	0	0	0	0	0	0	3	0	0	1	0		0	0	0	0	0	0	0	0	8			
Neu10_pre	2	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	9	unknown		
Neu10_Sept	1	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	23			
Neu10_post	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	11			
Neu11_pre	0	0	0	3	0	0	0	0	0	2	0	1	2	0		0	0	0	0	0	3	0	0	290	unknown		
Neu11_Sept	0	0	0	3	0	0	0	0	0	0	0	0	1	0		0	0	0	0	0	3	0	0	458			
Neu11_post	0	1	0	2	0	0	0	0	0	1	0	0	2	0		0	1	0	0	0	2	0	0	130			

Neu12_pre	1	3	0	3	0	2	0	1	0	0	0	0	2	0		0	3	0	0	0	3	0	0		17		unknown	
Neu12_Sept	1	3	0	3	0	2	0	0	0	0	0	0	2	0		0	3	0	0	0	3	0	0		41			
Neu12_post	0	3	0	3	0	3	0	1	0	0	0	0	1	0		0	3	0	0	0	3	0	0		12			
Neu13_pre	3	2	0	2	0	0	0	0	0	0	0	0	0	0		0	1	2	0	0	2	0	0		8		unknown	
Neu13_Sept	2	2	0	3	0	0	0	0	0	0	0	0	0	0		0	0	1	0	0	3	0	0		13			
Neu13_post	2	2	0	2	0	0	0	0	0	0	0	0	0	0		0	1	0	0	0	2	0	0		7			
Neu16_pre	0	0	0	4	3	0	0	0	0	0	0	0	0	0		0	0	0	0	0	4	0	0		42		unknown	
Neu16_Sept	0	0	0	4	2	0	0	0	0	2	0	0	0	0		0	0	0	0	0	4	0	0		30			
Neu16_post	0	0	0	3	2	0	0	0	0	0	0	0	0	0		0	0	0	0	0	3	0	0		10			