Insect venoms

Products for the determination of specific IgE to bee and wasp venom

Insect venoms contain highly potent allergens which cause IgE-mediated reactions. This reactions can be not only local but also severe life-threatening systemic up to anaphylactic shocks. The prevalence of insect venom allergies in the european population is about 5%. Amoung the Hymenoptera the honey bee (Apis melifera) and different wasp species (Vespula germanica or Vespula vulgaris) have the highest prevalence. Because of this a lot of allergens of these organisms were studied extensively, for some species recombinant allergens were already produced.

An accurate diagnosis whether a bee or wasp venom allergy or even a double sensitization is on hand is complicated by the appearance of so called „cross-reactive carbohydrate determinants“ (CCD), carbohydrate structures which occure in nearly all bee and wasp allergens and are able to bind IgE. In in-vitro tests patient samples with sIgE to CCD provide therefor positive reactions to bee and wasp venom. The clinical relevance of CCD is under discussion.

Today for a precise differentiation whether a bee or wasp venom allergy or even a double sensitization is on hand recombinant, nonglycosilated allergens are provided. Moreover there is the possibiliy to analyze a sample specifically to sIgE to CCD. In addition double sensitizations can be based on sIgE to homologous allergen sequences. In this case several insect venoms can cause systemic allergic reactions.

Bee venom	REF	I1
Wasp venom	REF	I3

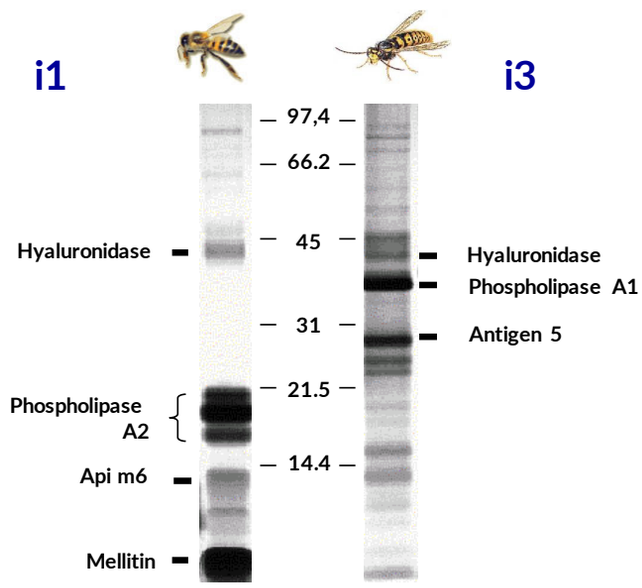

Figure 1
SDS Gelelectrophoresis of i1 and i3 extracts. Biotinylated extracts of i1 and i3 venom were separated by SDS-PAGE. All important allergens are present in the biotinylated extracts as examined by immunoblot (data not shown).

Available allergens

- **I 11** Native purified, glycosilated Phospholipase A2
- **Api m 1** Recombinant produced, nonglycosilated Phospholipase A2
- **Api m 2** Recombinant produced, nonglycosilated Hyaluronidase
- **Ves v 5** Recombinant produced, nonglycosilated Antigen 5
- **NF 253** Native purified CCD

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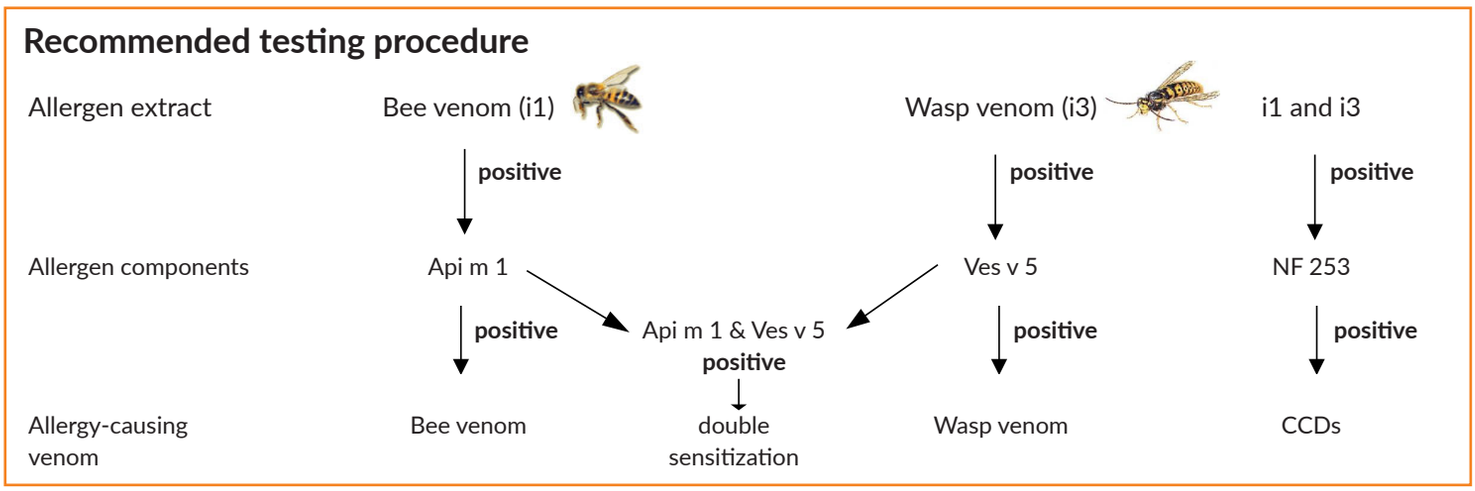
Recommended testing procedure



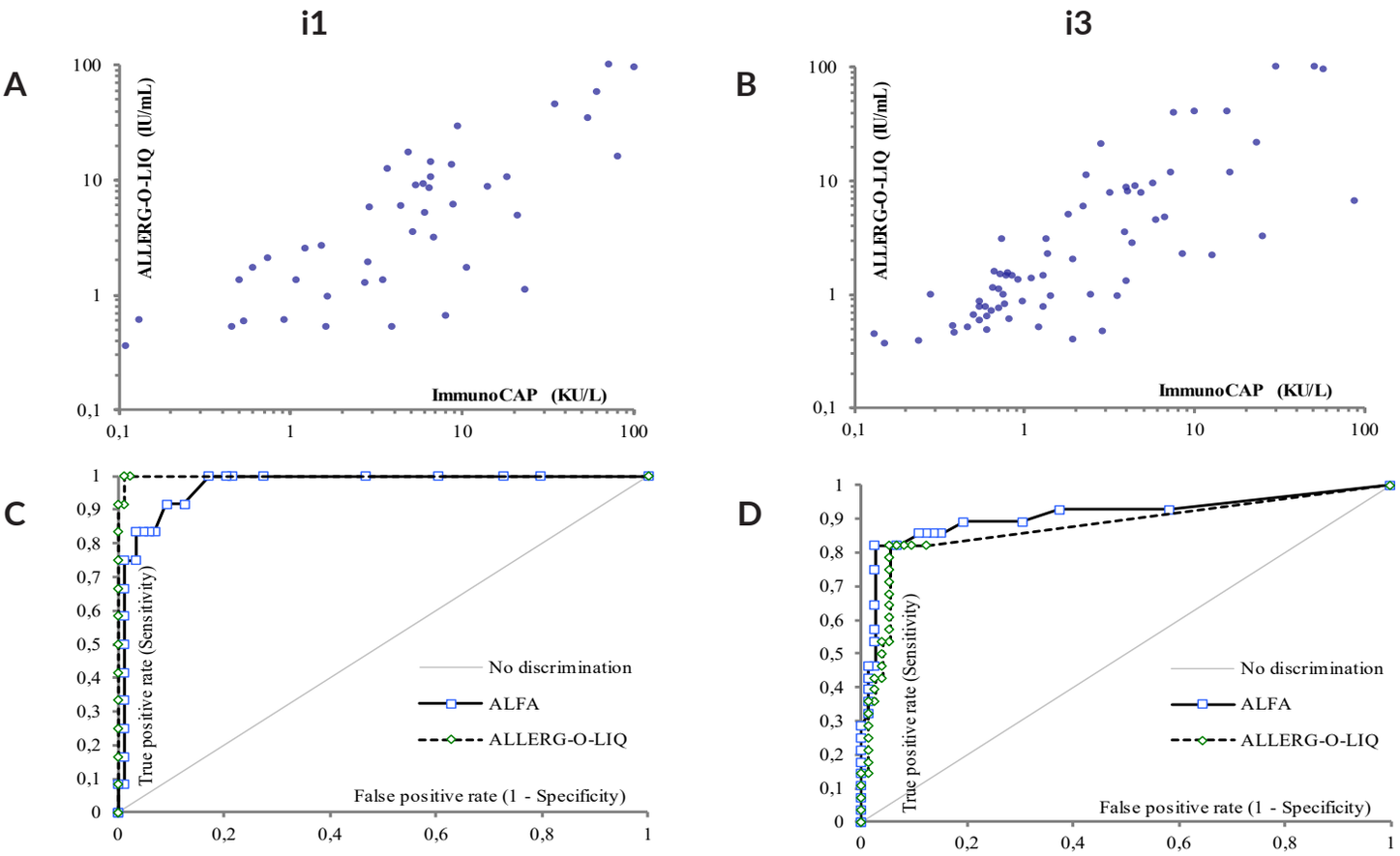


Figure 2
80 samples of patients with proven insect venom allergy and 60 samples of patients without insect venom allery were tested using ALLERG-O-LIQ, ALFA and ImmunoCAP® (Phadia) toward the existence of allergen specific IgE. A,B: Spearman correlation between ALLERG-O-LIQ and ImmunoCAP® results for i1 is 0.72 (95% CI 0.69 – 0.72; p<0,0001) and for i3 0.77 (95% CI 0.69 – 0.83; p<0,0001). C,D: The results of ALFA and ALLERG-O-LIQ were compared by a Receiver Operating Characteristic (ROC) curve with the diagnosis of persons allergic to insect venoms and persons not allergic to insect venoms. The diagnosis was determined from the results of the anamnesis, the ImmunoCAP®, the SPT and intracutaneous test. The AUC value of the ROC analysis of sIgE to i1 in ALLERG-O-LIQ is 1.00 (95% CI 1.00 – 1.00) and of sIgEs to i3 0.87 (95% CI 0.79 – 0.96). The AUC value of the ROC analysis of sIgEs to i1 in ALFA is 0.97 (95% CI 0.94 – 1.00) for sIgEs to i3 0.91 (95% CI 0.83 – 0.99).

Literature

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2. Muller UR, Johansen N, Petersen AB, Fromberg-Nielsen J, Haeberli G: Hymenoptera venom allergy: analysis of double positivity to honey bee and Vespula venom by estimation of IgE antibodies to species-specific major allergens Api m1 and Ves v5. Allergy 2009;64(4):543-8
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