

Allergy to sea fishing baits

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Summary. We report a new case of rhinitis and asthma caused by sea fishing baits. The results showed exposure to *Sipunculus nudus* (Phylum Sipuncula; order Sipunculida: Sipunculidae) to be the main cause of the allergic symptoms. The intervention of IgE was demonstrated, with the presence of cross-reactions with allergenic extracts from other worm species used as baits, belonging to different orders of Annelida.

Key words. Fishing baits, allergy, *Glycera dibranchiata*, bloodworm, *Nereis diversicolor*, *Perinereis cultrifera*, sandworms, *Lumbricus terrestris*, *Sipunculus nudus*, peanut worm.

Introduction

Some species belonging to the phyla Annelida (*Oligochaeta* and *Polychaeta*), Mollusca (*Bivalvia* and *Gastropoda*), Arthropoda (Crustacea: *Decapoda*), Chordata (*Engraulidae*: anchovies and *Clupeidae*: herrings) [www.ukmarinesac.org.uk] and *Sipuncula* (*Sipunculidea*), are the most common non-artificial baits used to practice sport sea fishing.

Most of the reported cases of allergy to live baits in amateur fishing have been caused by maggots belonging to some Arthropoda (*Insecta*: *Diptera*, *Coleoptera* or *Lepidoptera*) [1-3] and a very scarce number of papers describe allergy caused by species of Annelida included in the classes *Oligochaeta* and *Polychaeta* [4-7]. Up to now, we have no knowledge of any description of allergy to species from *Sipunculidea* class, despite the fact that *Sipunculus nudus* (peanut worm) is a live bait commonly used by amateur fishermen in some North Mediterranean countries.

The present study reports a new case of allergic asthma/rhinitis caused by *Sipunculus nudus*, and analyses the cross-reactivity among several allergenic extracts from other live baits from *Oligochaeta* (*Lumbricus terrestris*) and *Polychaeta* (*Nereis diversicolor*, *Glycera dibranchiata* and *Perinereis cultrifera*).

Case report

Over the last 10 years, a 45-year-old-woman with a personal history of allergy had developed allergic rhinitis and mild intermittent bronchial asthma, with sensitization to *Dermatophagoides pteronyssinus*, cat epithelium, *Olea europea*, *Parietaria judaica*, *Artemisia vulgaris* and *Chenopodium album*. Since 1996 she developed nasal symptoms (pruritus, sneezing, hydrorrhoea) and bronchial symptoms (dry cough, dyspnea, wheezing) associated with handling live bait (peanut worm) during fishing activities.

Physical examination was normal and the spirometry revealed an obstructive pattern.

After avoiding exposure to peanut worm and other *Polychaeta* or *Oligochaeta*, the patient improved, reverting to her normal condition. Currently, the use of molluscs or crustacean as bait causes no allergic reactions in this patient.

Immunological study

The results of skin prick tests to *Glycera dibranchiata* (bloodworm), *Nereis diversicolor* (sandworm), *Perinereis cultrifera*, *Lumbricus terrestris* (common earth worm)

Table 1. Results of skin prick tests and specific IgE (ImmunoCAP) to fishing bait extracts and cross-reactivity allergens.

	Specific IgE (kU/L)	Skin prick test (Area) [°]
<i>Sipunculus nudus</i>	34.1	1492.2
<i>Perinereis cultrifera</i>	24.6	530.6
<i>Nereis diversicolor</i>	12.7	326.7
<i>Lumbricus terrestris</i>	6.8	not done
<i>Glycera dibranchiata</i>	1.9	not done
Honey bee venom	<0.35	not done
Bromelin	<0.35	not done
Recombinant tropomyosin (rPen a 1)	<0.35	not done
Histamine HC1 10 mg/ml	–	201.0
Saline	–	no reaction

[°]: Skin prick test was performed on 1 mg of freeze-dried product/mL of diluent.

and *Sipunculus nudus*, and specific IgE (ImmunoCAP, Sweden Diagnostics AB) to the above mentioned worms, tropomyosin, bee venom and bromelin (cross-reactive carbohydrate determinants) [8], are shown in Table 1.

Skin prick tests with worm extracts performed in 5 non-atopic subjects and in 5 mite-sensitized patients proved negative.

Live bait extracts were obtained according to Postigo et al. [9].

Immunoblotting techniques performed according to

Asturias et al. [10] showed significant differences between the profiles of each species, revealing a wide range of IgE binding components covering all the spectrum sizes tested (97-14.4 kDa).

The allergens showing the highest capacity to bind IgE antibodies were in the peanut worm extract, which were able to inhibit the IgE antibody reactions to the other worm antigens (Figure 1), showing an extensive *in vitro* cross-reactivity with species from other classes of Annelida.

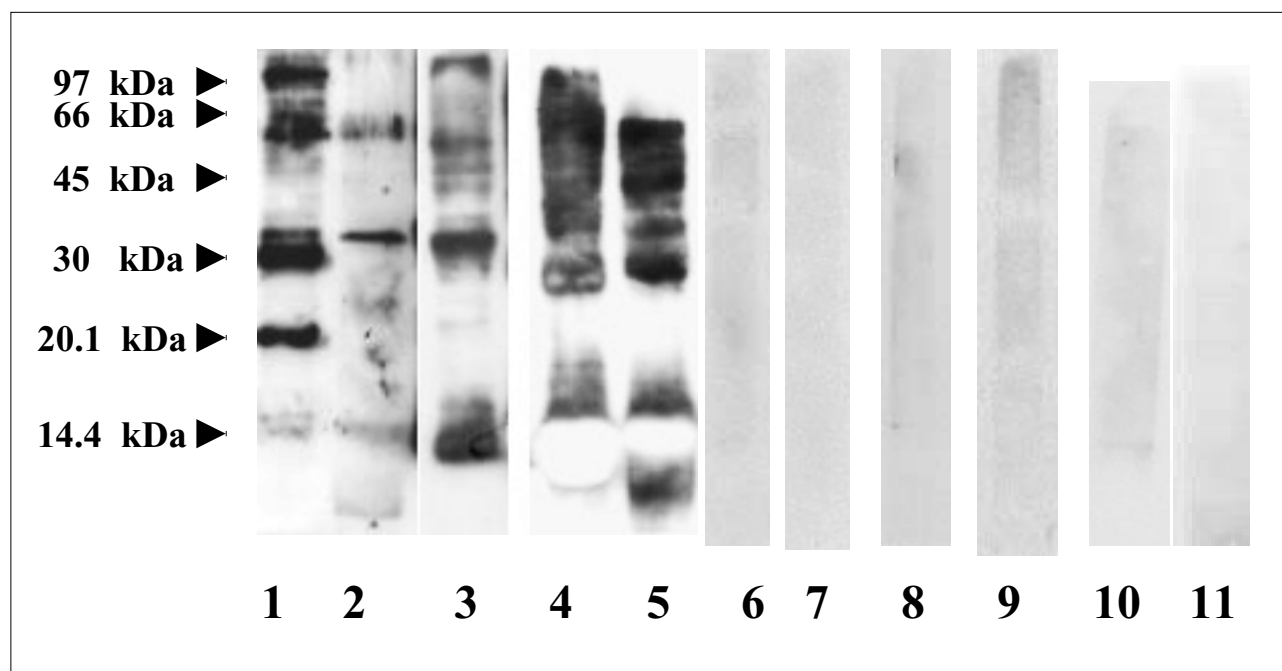


Figure 1. SDS-PAGE IgE-immunoblotting and SDS-PAGE IgE-immunoblotting-inhibition. *Lumbricus terrestris* (lane 1), *Nereis diversicolor* (lane 2), *Perinereis cultrifera* (lane 3), *Sipunculus nudus* (lane 4), *Glycera dibranchiata* (lane 5). Lanes 6 to 10 corresponding to immunoblotting-inhibition of *Lumbricus terrestris*, *Nereis diversicolor*, *Perinereis cultrifera*, *Sipunculus nudus* and *Glycera dibranchiata* respectively, when inhibited with *Sipunculus nudus*. Immunoblotting with serum from a non-atopic subject using *Sipunculus nudus* extract yielded no positive reaction (lane 11).

Discussion

Allergy to live fishing baits is relatively frequent, especially as a cause of work-related symptoms [1] in connexion with allergens from maggots belonging to some Diptera, Coleoptera or Lepidoptera families [1-3].

Despite the fact that amateur fishing is a widespread sport and worms belonging to Annelida are very common baits in Mediterranean countries, only few cases of allergy caused by Oligochaeta and Polychaeta have been described [4-7], and up to now no data have been reported on allergy to Sipunculidea.

The clinical history together with the values of specific IgE and the capacity of *Sipunculus nudus* extract to inhibit the IgE antibody reactions to other worm antigens suggest that this species was the primary cause of the allergy process in this patient, and the sensitisation to other species belonging to a different phylum (Annelida) could be due to a cross-reactivity phenomenon.

To the best of our knowledge, this is the first case report of IgE-mediated rhinitis and asthma induced by the live bait *Sipunculus nudus*.

The demonstration of non-detectable levels of IgE anti-tropomyosin in the serum means this panallergen has no implication in cross-reactivity among the worm species included herein. Non-detectable values of specific IgE to bromelin and honey-bee venom [8] also suggest that carbohydrate determinants have not been involved in the cross-reactions revealed in this study.

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