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SUMMARY

Asticot maggots are used as bait by anglers fishing the rivers, reservoirs and coastal waters of Spain. We report the case of a male patient, a keen angler, who used this bait on weekends and suffered allergic reactions that affected his conjunctiva and respiratory system for years. Other baits (earthworms, *Eisemia foetida*) did not elicit this reaction. In order to confirm the allergic reaction, we used maggots *in vivo* in the Prick Test, obtaining a positive reaction in 15 to 30 minutes. The patient also had an allergic reaction to house dust mites in prick test. To a lesser extent, he also was sensitive to certain grass pollens (*Lolium perenne*) and seafood (prawns and squid).

Key words: Rhinoconjunctivitis. Asthma. Asticot maggots. Bait. *In vivo* skin test.

RESUMEN

Los cuadros de hipersensibilidad respiratoria producidos por gusanos, son bastante menos frecuentes que los producidos por insectos. En este caso clínico, se describe la presencia de una rinoconjuntivitis y asma, en un pescador de agua dulce, originadas al utilizar el cebo de pesca gusano "Asticot". Cuando el paciente utilizaba al salir a pescar en el mar, en unas vacaciones, otro cebo, la lombriz de tierra (*Eisenia foetida*), no se producía sintomatología similar. El paciente no tenía síntomas de forma inmediata, sino retardada, algunas horas después de haber terminado de pescar. Durante varios años, su sintomatología fue solamente de rinitis; posteriormente, de asma. La prueba cutánea *in vivo* para el gusano "Asticot" fue muy positiva en prick test a los 20-30 minutos. Anteriormente, el paciente había sido tratado con extractos alérgicos, suponemos que por su hipersensibilidad para alérgenos inhalantes. La existencia de otras hipersensibilidades (ácaros, gambas y calamares), sugiere el fenómeno ya conocido desde hace unas décadas por autores alemanes, como "Bahnung", y citado por el Prof. Jiménez Díaz (32) en su libro de "Asma y Enfermedades Alérgicas". El paciente, ha seguido utilizando la lombriz de tierra como cebo de pesca, sin ocasionarle ninguna patología hasta la fecha actual.

Palabras clave: Rinoconjuntivitis. Asma. Gusano "Asticot" cebo. Test cutáneo *in vivo*.

INTRODUCTION

In 1713 Ramazzini wrote "Minute fragments of silkworms and other insects possess, on being inhaled, certain injurious potential for lung tissue". In 1929 Parlato (1) described the first case of rhinitis and asthma produced by fly species. Since then, numerous cases of allergic reactions to insects have been documented (2-5). Most of the cases studied have been the result of reactions to flies (6), cockroaches (7) and Lepidoptera (8), which have caused allergic respiratory reactions and usually were associated with occupational asthma. Other reactions have occurred in scientists (9) and food processors (foods of animal origin) (10). They were exposed professionally to inhalation or contact with flies or dried-up juvenile forms, or to insect larvae such as those used for bait (11-14). In the case of sensitivity to *Callimorpha* fly maggot bait, immune complexes were shown to be responsible. Sensitivity is less frequent in persons exposed to marine invertebrates. Cases have been reported of respiratory

hypersensitivity in persons working with abalone (*Haliotis*) (16, 17) and sea sponges (18). In 1977, Rigo and Falagiani (19) described a case of rhinitis and asthma in an angler who used a sea worm (*Marphysa sanguinea*) as bait. These authors used skin tests, PK and RAST with extracts of the sea worm. Parameters were positive to *M. sanguinea* and negative to a pneumo-allergenic bacterium.

Spain has an extensive coastline and river system, and Extremadura (SW Spain) has many reservoirs for irrigation and HEP, so angling is a sport and a hobby for many people.

There are several types of bait (20): commercial or specialized, organic or inorganic, plant or animal, dead or living animal matter, etc.

Prolonged and repeated use of bait on occasion may cause allergic reactions, which may or may not be immunological, immediate (e.g., rhinitis, conjunctivitis, asthma, urticaria, angioedema, anaphylaxis), or long-term reactions (e.g., contact dermatitis). These reactions may also be of intermediate nature (e.g., extrinsic allergic alveolitis or hypersensitivity pneumonitis).

In Spain, a case of rhinoconjunctivitis and asthma provoked by *Neveis diversicolor* (21) and a case of angioedema, rhinitis and asthma brought on by *Eisemia foetida* (22) have been reported. In the case reported in this paper, the patient used Asticot maggots as bait (Fig. 1), which were shown to produce rhinoconjunctivitis and asthma.



Figure 1.--The Asticot maggots (red and white forms) used as bait by our patient. This maggot elicited hypersensitivity reactions of the conjunctiva and respiratory tract.

CLINICAL CASE

We describe the case of a 34-year-old patient whose medical history included a mother with bronchial asthma. Twelve or thirteen years earlier, he used to fish in rivers or reservoirs in spring and summer. Two to four hours after he arrived home from fishing, he would experience frequent bouts of sneezing, itching of the nose, ear and throat, a stopped-up nose, and conjunctival reddening. These symptoms responded to medical treatment, although the patient did not remember the product used. Over the years, other symptoms appeared, including whistling sounds in the chest and dyspnea. These symptoms were alleviated by corticoid injections. If he avoided fishing, symptoms did not appear, even if it was spring or summer. On summer vacation he would go sea fishing using red worms for bait, without symptoms appearing. For the past 4 or 5 years he has not fished. His clinical history includes treatment with vaccines. In fall and winter, he only had nasal colds. Once, eating prawns and squid elicited angioedema of the lips and an itchy throat. Tests performed in the doctor's office showed nothing abnormal. Skin tests with the Prick Test to establish possible allergies to house dust, mites, pollen or fungi also were negative. However, similar tests with prawns and squid were positive. Prick test with Asticot maggots extract (prepared in our laboratory from macerated samples) was very positive (a papule of 4 x 2 cm²). Considering that skin tests with the Prick Test were negative for allergenic inhalants, *in vitro* tests were performed with the same compounds: *D. pteronyssinus* (Class III), *D. farinae* (Class III), *Lolium perenne* (Class I), house dust, *Alternaria tenuis* and other pollens (olive, *Poa*, *Secale*, *Artemisia vulgaris* and *Parietaria officinalis*) (Class O). Complementary analyses disclosed 6,000,000 RBC/mm³, hematocrit 44.5%, hemoglobin 15.2 g/dl, 271,000

platelets/mm³, 6,900 leukocytes/mm³: lymphocytes 33.5%, monocytes 9.2%, phagocytes 54%, eosinophils 2.8%, ESR 42/h, urine normal, general blood chemistry: blood glucose 89 mg/dl, urea 35 mg/dl, creatine 0.89 mg, uric acid 5.1 mg/dl, total cholesterol 241 mg/dl, triglycerides 241 mg/dl, total proteins 7.59 mg/dl, seroenzymes 43 IU/l, GPT/ALT gamma GT 88 IU/l, alkaline phosphatase 180 IU/l, electrolytes: sodium 140 mmol/l, potassium 4.0 mmol/l, chloride 100 mmol/l, phosphorus 3.6 mg/dl, calcium 9.8 mg/dl, total IgE 428.89 IU/ml. Radiographs of the chest and sinuses did not show any significant abnormalities. Baseline spirometric readings were normal.

These findings supported the diagnosis of conjunctivitis and bronchial asthma associated with rhinitis brought on by an allergy to house dust mites and a food allergy to prawns and squid. The patient was advised to change bait, for example to earthworms, to which he had no allergic response, sweet maize, or any other bait that did not produce allergy. We also suggested that prawns and squid be excluded from the diet. Rhinitis resulting from an allergic response to house dust mites was treated with immunotherapy and medication. As pollen sensitivity to *Lolium perenne* (Class I) was minimal in the *in vitro* test used and there was no evidence of a reaction to other pollens, immunotherapy was considered unnecessary. The patient was advised to take antihistamine for symptoms of rhinoconjunctivitis.

DISCUSSION

Over the years, there have been several reports of respiratory symptoms caused by allergic reactions to insects (23). One author (24, 25) has cited some 300 references in which insects were implicated in respiratory hypersensitivity reactions in humans.

Although it is generally accepted that allergies to insects occur in certain professions and occupations (26), few published cases have confirmed this link with *in vitro* and *in vivo* studies (27). In Spain, the cases cited (21, 22) are well documented. A relationship, or concordance, with IgE levels in skin tests using cockroaches has been reported (28, 29), the first being 50% and the second 20/22.

Hypersensitivity to insect allergens has been reported (30) in patients with asthma provoked by the usual pneumoallergens. However, respiratory allergic responses to larvae in anglers, as opposed to persons with an occupational exposure to invertebrates, are less frequent.

It is accepted that hypersensitivity toward insects and their larvae occurs, but is less common than hypersensitivity to maggots.

Some authors (7, 27-29, 31) require the existence of a correlation between *in vivo* and *in vitro* tests in order to establish the presence of hypersensitivity to invertebrates. This would confirm the existence of an allergic reaction to maggots. In the case reported, the clinical evidence and results of the Prick Test met this requirement.

Hypersensitivity reactions to Asticot and other maggots may be caused by emanations (25) from certain parts of the larval body that are dispersed easily and may be inhaled. These emanations cause a hypersensitive reaction in the respiratory tract and have been found to be products of the hemoglobin of certain insects. These molecules have a molecular weight of approximately 17,000 in some arthropods (9).

Spanish authors (20) described baits that produce cutaneous and respiratory sensitivity, and reviewed the literature on allergic disease caused by bait (31), which was useful for the present study.

We consider this case interesting because no such case has been reported in Spain and Asticot maggots have not been cited by the literature of other countries. This bait first caused rhinitis-like symptoms, then asthma. We have since encountered similar cases, including a patient with rhinitis elicited by the same species of maggot. The case reported here is considered the most interesting.

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