

Allergic rhinoconjunctivitis caused by *Harmonia axyridis* (Asian lady beetle, Japanese lady beetle, or lady bug)

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Allergic symptoms to a variety of nonstinging insects have been reported.¹⁻⁴ Many of these are related to occupational exposure in bait shops or research laboratories or to recreational exposure. We are unaware of any previous reports of lady bug sensitivity.

CASE 1

A 48-year-old white man with no history of hay fever or asthma or family history of atopy was seen with a 4 months' duration of nasal and ocular pruritus and sneezing. Symptoms were present at home and work and were not significantly improved by antihistamines, ocular cromolyn, and topical nasal steroid sprays. Physical examination revealed normal-appearing nasal mucosa and watery rhinorrhea. Skin prick testing (SPT) to common commercially available inhalants was nonreactive with a reactive histamine control. Further questioning revealed that his house had been infested with lady bugs for the same amount of time that he been having symptoms. The lady bugs were collected and identified by an expert entomologist (Dr Beverly Sparks, University of Georgia) as *Harmonia axyridis*. A crude extract was prepared by washing lady bugs from the patient's home with use of PBS. The lady bugs were then crushed in the saline solution and a 1:10 dilution of the supernatant was used for skin testing. SPT with the lady bug extract produced a 4 × 4 mm wheal with a 20 × 20 mm flare. Two control individuals had no measurable reaction to the lady bug extract but had normal histamine prick responses.

CASE 2

A 56-year-old woman was initially evaluated in March 1994 for possible allergic rhinitis. The SPT was positive for trees and negative for other common inhalants. The patient responded to immunotherapy until early 1998, when she again noted upper respiratory symptoms. Repeat SPT was negative to common inhalants, including trees, with appropriately positive and negative controls. A 2-month trial of a steroid nasal spray and an antihistamine resulted in no noticeable improvement. The patient then mentioned that her symptoms correlated with severe episodic lady bug infestations.

Abbreviation used

SPT: Skin prick testing

Lady bugs obtained from the patient's home were identified by an expert entomologist (Dr Charles Curry, Virginia Tech) as the Asian lady bug, *H axyridis*. SPT with a lady bug extract prepared as above produced an 11-mm wheal without surrounding erythema. Two control individuals had no measurable reaction to the lady bug extract but had normal histamine responses.

METHODS

To identify proteins in the extract, SDS-PAGE was performed with 15% gels under reducing and nonreducing conditions with Coomassie blue staining. IgE immunoblotting was performed to identify potential allergens. Gels were transferred to nitrocellulose and blocked with TRIS-buffered saline solution–0.5% Tween-20. Nitrocellulose strips were incubated with serum from the patients and 2 controls, washed, and incubated with horseradish peroxidase-labeled antihuman IgE (Biosource International, Camarillo, Calif). After washing, blots were developed by incubation with a chemiluminescence reagent (NEN Life Sciences, Boston, Mass) and recorded by autoradiography. An intensely stained single band was found at 16.6 kd in the first patient but not in the 2 controls. A 16.6-kd band was also revealed in the second patient's serum, as was an intensely stained 30-kd band that was not observed in the first patient's serum. No bands were found in the sera of 2 control subjects (Fig 1).

RESULTS

Patient 1 used general cleaning methods with good results to remove the lady bugs from his home. His symptoms showed progressive improvement. Eradication of the lady bugs from the home of patient 2 resulted in complete symptomatic improvement.

DISCUSSION

Although inhalant allergy to insects is well known, we are not aware of prior reports of allergic rhinoconjunctivitis to *H axyridis*. The Asian lady bug was introduced into the southeastern United States in the late 1970s as part of a program to use biologic agents to control aphids that were plaguing farmers and gardeners alike. Unlike the domestic variety, the Asian lady bug is active throughout the year and winters in protected areas,

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including inside households. The attic is a common portal of entry, but the insects are small enough to enter breaks in the environmental seal of a house. Once inside, they can be eliminated with vigorous environmental measures. Vacuuming, dusting, and adding physical barriers to prevent re-entry should all be used. Caulking gaps and holes and improving the energy seal of the house is a necessity. Dead lady bugs attract pests such as carpet beetles, so insecticides should be avoided. Although certainly impractical, some experts advise moving to lower ground or painting houses black because in their native habitat these beetles winter in the crevices of light-colored cliffs.

The true prevalence of lady bug sensitization is not known but may be substantial because lady bug infestation of southeastern homes is common in the winter. Lady bug allergy may be the explanation for some cases of allergic symptoms that have previously eluded diagnosis.

REFERENCES

1. Wahl R, Fraedrich J. Occupational allergy to the housefly (*Musca domestica*). *Allergy* 1997;52:236-8.
2. Soparkar GR, Patel PC, Cockcroft DW. Inhalant atopic sensitivity to grasshoppers in research laboratories. *J Allergy Clin Immunol* 1993;92:61-5.
3. Siracusa A, Bettini P, Bacoccoli R, Severini C, Verga A, Abbritti G. Asthma caused by live fish bait. *J Allergy Clin Immunol* 1994;93:424-30.
4. Eriksson NE, Ryden B, Jonsson P. Hypersensitivity to larvae of chironomids (non-biting midges): cross-sensitization with crustaceans. *Allergy* 1989;44:305-13.

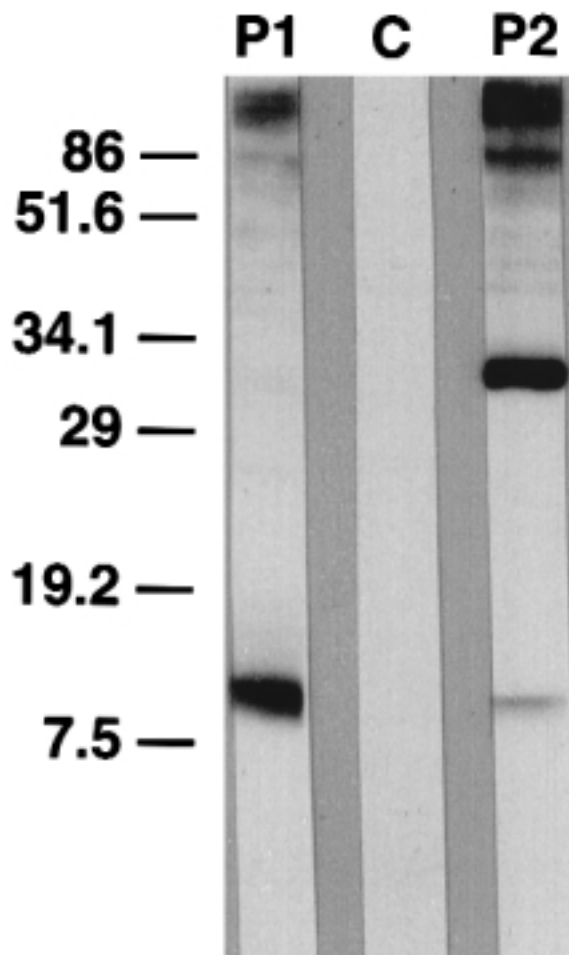


FIG 1. IgE immunoblotting demonstrating intensely stained single band at 16.6 kd in first patient (*P1*). Two bands were demonstrated in second patient's serum (*P2*), one at 16.6 kd and a second at 30 kd. No bands were found in sera of 2 control subjects. One of controls (*C*) is shown.