

Case report

Protein contact dermatitis caused by *Nereis diversicolor*

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Cases of contact dermatitis caused by *Nereis diversicolor*, a marine worm used as bait for fishing, are rare. The first cases were reported in 1957 by two French dermatologists, Montel and Gouyer (6), who applied the term *escavenite* to itchy lesions on the fingertips of the right hand, observed in some fishermen in the St Raphael area of the Côte d'Azur. In Italy, while the first cases were reported by Strani et al. (10) from the Ligurian coast (near Alassio), the most recent case has been described by Angelini et al. (1). A similar case of contact dermatitis from another kind of marine worm, *Lumbrinereis impatientis*, was reported by Romaguera et al. (8), on the coast near Barcelona (Spain).

Our report documents a case we observed in the allergology outpatient department.

Case report

A 23-year-old male university student had eczematous lesions on the fingers of his left hand and on his right thumb. The finger skin showed marked erythema, induration, and scaling; the right thumb also showed rhagades and signs of onycholysis (Fig. 1). The lesions were itchy and painful. Dermatitis was absent elsewhere.

His relevant past history included intermittent rhi-

norrrhea (hay fever) due to Urticaceae (*Parietaria judaica*). Past medical history was otherwise non-contributory; there was no evidence of drug hypersensitivity. Pertinent family history consisted of asthma, hay fever, and atopic dermatitis in both parents and several siblings.

Detailed history of the present illness disclosed that the hand dermatitis was his major medical problem and of greater importance to him than the chronic rhinorrhea. In spite of numerous visits to several dermatologists during the last year, cutaneous remissions were usually incomplete. Innumerable topical medicaments, including corticosteroid creams and ointments, provided intermittent temporary relief.

From the patient's personal history we discovered that he fished as a hobby and that the clinical flare-ups occurred after handling the worm (*N. diversicolor*) used as bait. *N. diversicolor* (Table 1), a marine worm whose natural habitat is the North Sea, the English Channel, the Atlantic Ocean, and the Mediterranean Sea, is sold in Italy in fishing tackle stores (Fig. 2).

The anatomic features of this kind of worm are a segmented body with protuberances called parapodia, with tufts of chaetae. In each segment, there also are some tubular organs called segmented organs, which serve to expel both excretions and



Fig. 1. Patient's right thumb with rhagades and signs of onycholysis.

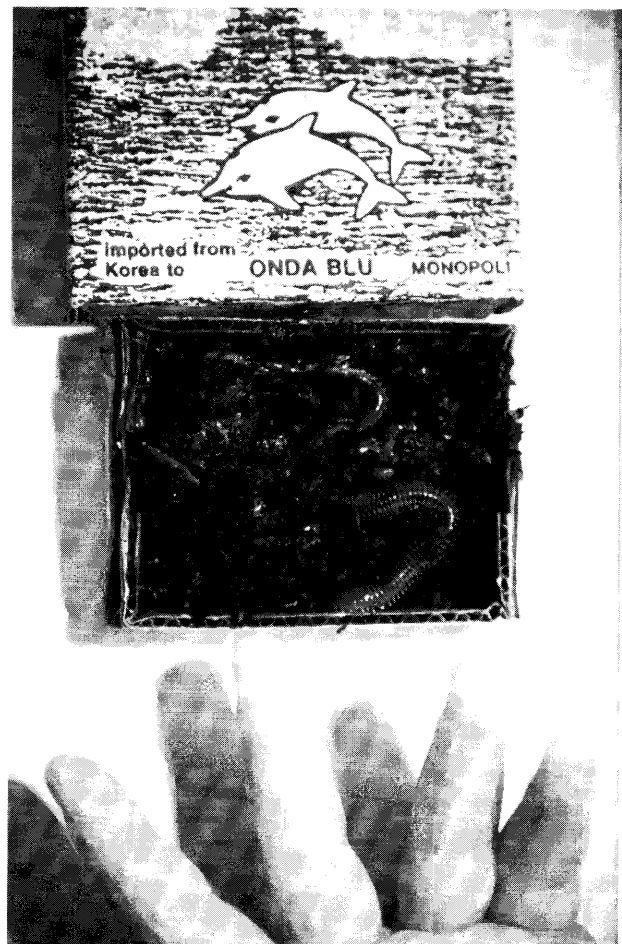


Fig. 2. Retailers' box of bait and patient's left hand with eczematous lesions.

Table 1. Taxonomy of *Nereis diversicolor*

Phylum:	Annelida
Class:	Polichetae
Order:	Errantis
Family:	Nereidae
Genus:	<i>Nereis</i>
Species:	<i>Nereis diversicolor</i>

reproductive fluids. The worm has a proboscis with maxillae corneae, two pairs of eyes, and a bright color.

Some species found in the mud of sandy coasts show a high tolerance of variations in salinity.

Zoologists and marine biologists doubt that *N. diversicolor* has toxic, poisonous, or irritant effects on man.

Results

Skin prick tests and RAST with common inhalants and food allergens were positive to *Parietaria judaica* only. Seventy-two-hour patch-tests with the routine

series of the International Contact Dermatitis Research Group were negative.

We then obtained the worm's celomic fluid by making an incision in the segmented organs and aspirating the fluid. A patch test with the celomic liquid was performed on normal skin and revealed, after 72 h, a slight positivity with erythema and microvesicles.

An open epicutaneous test, performed on the previously eczematous fingers with celomic liquid, within 30 min provoked a crop of dyshidrotic vesicles, preceded by erythema and itching. This test was negative when performed on normal skin of the patient and normal controls, and it became positive only after repeated applications on normal skin of the patient.

We also performed the open epicutaneous test, with celomic fluid, on previously eczematous lesions of patients with dyshidrotic eczema of the hands but with a negative history of worm contacts and it was negative. The same patients underwent skin prick tests with the celomic fluid, and their results were all negative as were our patient's. These findings are

important to explain the allergic, nonirritant nature of the skin reaction.

A biopsy specimen was also taken from the fingers 30 min after the open test. This revealed spongiosis and infiltration of lymphocytes both in the lower epidermis and the corium; there were also subcorneal vesicles. A similar picture resulted from the histopathologic examination of the previously eczematous lesion of the finger; this showed a moderately inflammatory picture with parakeratosis, a reduced number of lymphocytes, and no subcorneal vesicles.

The peptide in raw worm fluid and its high and low molecular fractions were analyzed by sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE), and the concentration of protein in the various fractions was determined. High molecular weight compounds (polypeptides) of worm fluid may be mainly responsible for the skin symptoms (8).

After avoidance of handling *N. diversicolor* as bait, the patient's hands healed and no reaction occurred when he used other bait.

Discussion

Protein contact dermatitis (PCD) is a rare allergic skin disease caused by contact with protein substances (3). It is often seen in patients working in the food industries or in kitchens (2, 3, 7, 11), and many of them show no other signs of atopy. PCD, which was first described a decade ago, presents an itching vesicular eczema on the hands and fingers from 20 min to a few hours after contact with animal or vegetable material (5).

Although Seeberg (9) was the first to describe this kind of cutaneous lesion due to PCD, more recently, Hjorth & Roed-Petersen (3) have better defined it as "protein contact occupational dermatitis", which is different from both irritant and allergic contact dermatitis. The hands of patients who have previously suffered from this kind of lesion, but are apparently healed, may develop an erythematous-vesicular reaction due to frequent contact with animal or vegetable proteins: this immediate-type reaction could be caused by a rapid penetration into the cutis of sensitizing proteins. Although several investigations

have been carried out, PCD is still a dermatologic disorder of interest because of questions concerning its pathogenetic mechanisms which remain unsolved.

At present, in fact, there is no adequate immunologic or toxicologic explanation of this phenomenon. However, skin symptoms usually manifest as an immediate-type reaction (type I reaction according to Coombs & Gell), but changes to type IV reactions have been reported (4).

In conclusion, we considered it of interest to report this case since there is a steady increase, at least in Italy, in the use of this kind of bait as an alternative to more traditional ones. We also do not exclude the possibility of cross-reactivity between *N. diversicolor* and other species of worms used as fishing bait. Therefore it is advisable to bear this hypothesis in mind when observing the kind of lesions we described.

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