Aquatic Antagonists: Seaweed Dermatitis (Lyngbya majuscula)

Kathleen L. Hill, MD; Haley M. Fulton, MD; Thomas W. McGovern, MD

The cyanobacterium Lyngbya majuscula grows in marine and estuarine environments across the world and produces many biologically active compounds. Direct contact with L. majuscula and its dermatoxins can cause seaweed dermatitis, which manifests as a papulovesicular eruption. As oceans warm, L. majuscula will bloom more frequently; therefore, public awareness of L. majuscula and seaweed dermatitis in oceanside communities can help promote precautions that can reduce the risk for exposure. This article describes the irritants that lead to dermatitis, clinical presentation, and prevention and management of seaweed dermatitis.

Identifying Features and Distribution of Plant

Lyngbya majuscula belongs to the family Oscillatoriaceae; these cyanobacteria grow as filaments and exhibit slow oscillating movements. Commonly referred to as blanketweed or mermaid’s hair due to its appearance, L. majuscula grows fine hairlike clumps resembling a mass of olive-colored matted hair. Its thin filaments are 10- to 30-cm long and vary in color from red to white to brown. Microscopically, a rouleauxlike arrangement of discs provides the structure of each filament.

First identified in Hawaii in 1912, L. majuscula was not associated with seaweed dermatitis or dermatotoxicity by the medical community until the first outbreak occurred in Oahu in 1958, though fishermen and beachgoers previously had recognized a relationship between this particular seaweed and skin irritation. The first reporting included 125 confirmed cases, with many more mild unreported cases suspected. Now reported in about 100 locations worldwide, seaweed dermatitis outbreaks lodge in swimmers’ bathing suits, the toxins can become trapped against the skin and cause seaweed dermatitis. With climate change resulting in warmer oceans and more extreme storms, L. majuscula blooms likely will become more frequent and widespread, thereby increasing the risk for human exposure. Herein, we describe the irritants that lead to dermatitis, clinical presentation, and prevention and management of seaweed dermatitis.
have occurred in Australia; Okinawa, Japan; Florida; and the Hawaiian and Marshall islands.1,2

Exposure to Seaweed
Lyngbya majuscula produces more than 70 biologically active compounds that irritate the skin, eyes, and respiratory system.2,4 It grows in marine and estuarine environments attached to seagrass, sand, and bedrock at depths of up to 30 m. Warm waters and maximal sunlight provide optimal growth conditions for L. majuscula; therefore, the greatest risk for exposure occurs in the Northern and Southern hemispheres in the 1- to 2-month period following their summer solstices.5 Runoff during heavy rainfall, which is rich in soil extracts such as phosphorous, iron, and organic carbon, stimulates L. majuscula growth and contributes to increased algal blooms.5

Dermatitis and Irritants
The dermatoxins Lyngbyatoxin A (LA) and debromoaplysioxin (DAT) cause the inflammatory and necrotic appearance of seaweed dermatitis.1,2,5,8 Lyngbyatoxin A is an indole alkaloid that is closely related to telocidin B, a poisonous compound associated with Streptomyces bacteria.9 Sampling of L. majuscula and extraction of the dermatoxin, along with human and animal studies, confirmed DAT irritates the skin and induces dermatitis.5 Noncutaneous manifestations of seaweed dermatitis include headache, fatigue, and swelling of the eyes, nose, and throat (Figures 1 and 2).1,5

Prevention and Management
To prevent seaweed dermatitis, avoid swimming in ocean water during L. majuscula blooms,10 which frequently occur following the summer solstices in the Northern and Southern hemispheres.5 The National Centers for Coastal Ocean Science Harmful Algae Bloom Monitoring System provides real-time access to algae bloom locations.11 Although this monitoring system is not specific to L. majuscula, it may be helpful in determining where potential blooms are. Wearing protective clothing such as coveralls may benefit individuals who enter the water during blooms, but it does not guarantee protection.10

Currently, there is no treatment for seaweed dermatitis, but symptom management may reduce discomfort and pain. Washing affected skin with soap and water within an hour of exposure may help reduce the severity

![Image](https://example.com/image1)

**FIGURE 1.** A punch biopsy of an abdominal lesion in a patient with seaweed dermatitis (Lyngbya majuscula) showed an intraepidermal blister with superficial desquamation at the top (H&E, original magnification ×40). Photograph courtesy of Scott Norton, MD, MPH, MSc (Washington, DC).

![Image](https://example.com/image2)

**FIGURE 2.** Classic erythematous papulovesicular rash on the abdomen of a patient with seaweed dermatitis (Lyngbya majuscula). Photograph courtesy of Scott Norton, MD, MPH, MSc (Washington, DC).
of seaweed dermatitis, though studies have shown mixed results.\(^6\,7\) Application of cool compresses and soothing ointments (eg, calamine) provide symptomatic relief and promote healing.\(^7\) The dermatitis typically self-resolves within 1 week.

**REFERENCES**