Horseshoe Crabs: The Blue Blood That’s Fueling the Medical Industry

Anyone who has ever benefited from an injection, a pacemaker, or a joint replacement, has the humble horseshoe crab to thank. In fact, all FDA approved vaccines, injectable drugs, and implanted medical devices owe their effectiveness to the blood of horseshoe crabs.

Why Horseshoe Crab Blood?

Horseshoe crabs are some of the oldest animals on the planet. At least 200 million years older than dinosaurs, these crustaceans have survived multiple mass extinctions that doomed millions of their companions. Yet, crabs today are experiencing an unprecedented threat to their existence- and your medical history is most likely contributing to the problem.

Four hundred and fifty million years of existence has led to a lot of evolutionary advantages for the horseshoe crab, specifically in their blood. This cerulean-hued substance is filled with antibacterial properties that make it incredibly valuable for medical procedures. The coloring comes from copper, which interacts with crab blood like iron does in ours. Rather than looking red, however, copper turns crab blood blue.

In many ways, the crab’s circulatory system has little in common with our own. When pathogens enter a crab’s body, their blue blood cells release a chemical called amoebocyte lysate (LAL) that thickens on contact with the invading substance and acts as a physical barrier against it, preventing it from spreading throughout the body.

While many animals have similar blood mechanisms for keeping out intruders, few do it as well as the horseshoe crab. Crab blood amebocytes can coagulate around as little as one part in a trillion of bacteria (the equivalent of a grain of sand in a pool), and the reaction takes less than an hour, in contrast to more than two days for mammal blood.

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Crab Blood Use in Human Medicine

The unique properties of crab blood make it incredibly useful in medicine today. Pharmaceutical companies rely on LAL to test their equipment, medical implants, and more for any trace of invading toxins.

This means that crab blood is used in labs, as individual cells are burst to gain access to the coagulogen inside. Contamination can then be detected in any substance that comes into contact with this blood, and any dangerous bacteria that’s present will quickly become encapsulated in a highly obvious gel. If no gel is formed, then the likelihood of bacterial contamination is so low that the substance is considered safe for human use.

LAL tests are a quick, simple, and highly accurate way to seek out contamination in human medical supplies. Every drug certified by the FDA requires LAL testing, meaning that the demand for crab blood is sky-high. In short, everyone in the United States that has had a medical injection in some form has directly benefited from crab blood, and without crab blood, more people would die from preventable infections.

Rising Demand

As demand for crab blood continues to grow, so do the number of crabs caught every year. Roughly 200,000 crabs were harvested for their blood in the 1990s, and that number had

risen to over 600,000 by 2012. At present, over three-quarters of a million crabs are harvested every year for medical use. These crabs are caught directly from the ocean, strapped into trays in mobile laboratories and bled for up to three days. Quart bottles are quickly filled with their highly-valued blood, which can sell for $60,000 a gallon. Each crab caught is expected to "donate" a full third of his blood for an industry that rakes in over $50 million a year.

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The Costs for Crabs

The climbing demand for crab blood has a tremendous cost for horseshoe crab populations. After the bloodletting, crabs are returned to the ocean far away from where they were harvested in order to prevent them from getting picked up again. According to the industry, less than a quarter of bled crabs die from the procedure, but recent evidence is beginning to challenge those claims.

Studies have shown that removing a third of a crab's blood leaves them disorientated and disabled once they get back into the ocean, which significantly impacts a female's ability to breed. Making matters worse, most crabs are harvested in shallow water, which is the preferred place for females to lay their eggs. The impacts of bloodletting on nesting crabs is unknown, but it's unlikely that females produce many viable offspring after the process.

No Quotas for the Medical Community

Strange as it may sound, regulations surrounding the harvesting of horseshoe crabs are surprisingly scant. While the Atlantic States Marine Fisheries Commission has harvest quotas in place for fishermen that catch horseshoe crabs to

use as bait, laboratory companies are exempt from these quotas. Arguing that the value of their product should exempt them from regulation, the medical industry is instead required to follow voluntary, open-ended “best management” practices for crab harvesting.

A Critical Dip in Crab Populations

Today, scientists are starting to notice the impacts of the crab blood industry. Fewer crabs are spotted along the Atlantic coast each year, and concern is growing that the biomedical industry is critically endangering one of the oldest surviving species on earth. Smaller numbers of females are spawning each year, and the evidence is increasingly clear that blood harvesting is having a bigger impact on the overall population than previously believed. Post bleeding, crabs are lethargic, slow and less likely to look for food or a mate, which threatens their populations even when the procedure doesn’t immediately kill them.

There’s much that’s still unknown about the lives of horseshoe crabs, but the evidence is clear that the biomedical industry is taking a tremendous toll on their populations. Dwindling of this ancient species isn’t just a concern for conservationists, it’s an issue for everyone who relies on modern medical services.

Every one of us is connected to the horseshoe crab, but we are quickly losing the power to save it.

Recommend Reading:

- *How to Regrow Your Favorite Herbs and Save Lots of Money*
- *How To Make Natural Body Butters That Actually Moisturize Your Skin*
- *Three Easy Mushroom Varieties To Grow at Home*
- *How to Use Vinegar and Baking Soda to Clean Your Home*

Sources:

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- *Biomedical Bleeding Affects Horseshoe Crab Behavior* – Science Daily
- *The Blood of the Crab* – Popular Mechanics
- *The Chilling Image Behind Every Vaccine You've Ever Had* – The Dodo
- *The medical industry is plundering a 450-million-year old species for its rare blue blood* – The Quartz
- *We Suck Horseshoe Crabs' Blood, Chuck Them in Sea* – Newser