

Popular Article

Star War of Blood in Covid-19

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Introduction

The marvelous ocean plays a massive part in the medicinal field every day. Now a days Horseshoe crabs play an essential role in saving millions of people's life with the help of blood. It is one of the living fossils with more miracle creations in the world because it plays a significant part in the result of Covid-19 injections. Horseshoe crab blood is a bright color blue shade with remarkable antibacterial properties. The critical ingredient of the pharmaceutical industry is millions of "HORSESHOE CRAB BLOOD". Crab blood contains LIMULUS AMEBOCYTE LYSATE (LAL), which is used to test vaccines, drugs and medical devices to confirm whether they are contaminated with dangerous bacterial toxins ENDOTOXINS. Millions of horseshoe crabs are captured and extracting milky blue blood every year. But now, the conservation organizations are taking steps and efforts to save the crabs. In the 1990s, the University of Singapore prepared a synthetic version of LAL called Recombinant Factor (RFC). More than 55 countries have approved RFC for commercial use also. Nowadays, most people say that "Synthetic are effective compared to LAL". In upcoming days, we have to live with more and more pathogens, so we should take lethal toxin tests due to endotoxin contamination. The level of contamination is based on the presence of LAL blood clots in the surrounding area of Endotoxins. Under Atlantic State Marine Fisheries Commission, the biomedical industry takes 500000 horseshoe crabs per year. According to the Mid Atlantic Sea, 30% of crabs are exploited in the ocean due to blood extraction. In 2002, 334000 population of crabs and in 2019, approximately 725000 nos. In the present context, Asian Horseshoe crabs *Tachpleustridentatus* are disappearing, so that's why it is under IUCN RED LIST. The crab, as mentioned earlier, demand is so high because it contains a strain with more antimicrobial properties, which is an FDA approved strain.

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An Element of Divine Blood That Functions with In Blessed Human Body.....

During the Covid-19 period, scarcity of medical products at that time pharmaceutical companies shifted to the rFC strain of horseshoe crab for vaccines. So that crab related creatures are in the worst condition due to less diversity of crabs. Crab blood is used to find infections like Gram-negative bacteria that are E.coli, and LAL is the only substance to detect gram-negative bacteria in the medical field.

The Bleeding of Crabs Leads to Endangered Species

Medical Testing Laboratories are not saying, "How many crabs are used to sample their blood through bleeding?" Mostly one third of the blood is drained from the crabs and again leave it in the Ocean water to alive.

Alive Condition Crabs Suffer More Than in Dead Condition

We have been exploiting more horseshoe crabs for decades by doing our experiments, but it has a high-value part in the biotech economy. They are only extracting the blood using that crab, but it has no economic value. According to the National Oceanic and Atmospheric Administration, horseshoe crab blood price is almost 15000 dollars per quart.

Don't Empty Horseshoe Crabs for The Treasure of Marvel Blood

The half-Billion-year-old creature makes a central turning point, especially regarding the covid-19 vaccine. When we are getting a new vaccine from the crab blood, their life spans depend on our beneficial needs for Medical testing because the Potential crab contains antibacterial, anti-viral, and anti-cancer agents. LAL reagent is produced from white blood cells of Atlantic horseshoe crab (*Limulus polyphemus*), necessary approval by the Food and Drug Association. In India, it is distributed on the North East Coast of India like Sunderbans (estuarine mangroves of Ganges), north of West Bengal (WB) coast, coasts of Orissa and northern Andhra Pradesh (AP) in the south of the Bay of Bengal.

How Is the Milky Blue Blood Coming?

Copper is the primary pigment in crabs' blood because it has powerful Antioxidant traits for safeguarding cells from oxidative damage by toxins and harmful free radicals. Mostly the iron-based oxygen-carrying hemoglobin molecules in our blood give red color. But copper-based Hemocyanin molecules give MILKY BLUE COLOUR in horseshoe crabs.

Spawning Of Horseshoe Crab on Multi-Million Biomedical Business

Natural Adaptability

Nowadays, everyone thinks about modern medicine means the highlighted point is chemicals are synthesized and given as drugs and tablets. But most very rarely, they will use natural sources as medicine, which is easily adapted to everyone, especially horseshoe crabs. It is highly used in modern medicine because of its more bacterial and viral properties in blood.

How It Is Used Against Infections

Crabs are not easily harvested. But for the Endotoxin test, the crab blood is taken because it contains more antibodies to fight against the pathogens. It is mainly used in testing new modern medicines, vaccines, and drugs. Every year Atlantic horseshoe crab (*Limulus polyphemus*) comes for spawning and is utilized in industrial endotoxin. Some behavioral changes are too risky for crabs after bleeding blood from crabs and returning to the ocean water.

How to Reduce the Need for Wild Crabs?

In the new endotoxin test, we can use a supplement of LAL strain. For example, In the Recombinant factor test.

The cloned rfc reagent extracted from the DNA of Singapore horseshoe crab reduces the need for repeated bleeding. (Ding et al.,1995). In the LAL test, rfc test triggers a pathway to coagulation when endotoxins come into contact with factor C. The rfc molecule has multiple potential endotoxin binding sites, and the rfc assay has more sensitive and specific than the LAL test (Thorne et al.,2010).rfc test is called an Alternative Assay test.

Menace Of Crab Lifetime

- **Humans catch on spawning ground grounding after spawning**
- **Loss of environment due to erosion**

A Venturous Journey: -

- I. Using a Trawl net or hand harvest Fisherman collects the crab from water resources and puts them into the fish hold chamber in the boat.
- II. After reaching near shore, the crab catch should be placed into the container truck, and it is transported to the bleeding facility or into the Diagnostic Lab.
- III. Over some time, the crab container should be kept aside almost a night before they are bled.
- IV. The crabs are placed in a rack in an upside-down position and injected with a 14-gauge needle, and approximately 30% of blood is extracted.
- V. After blood extraction, the crabs are transferred into the same container almost overnight before returning to the water.
- VI. After collecting the blood, it should be stored in a storage bottle under suitable conditions.

VII. Crabs stay out of the water for about 24-72 hours during the bleeding process. at that time, crabs are get easily dehydrated and prone to death. to maintain in alive conditions, we should not expose to the heat and atmospheric conditions.

COVID-19 pandemic time, the need for LAL is increased for more endotoxin tests, especially for vaccine production. After Conversion and adapting to rfc , 90% demand is reduced for LAL because due to bleeding of crabs and more mortality happening every year, it is now reduced by 100000 horseshoe crabs annually. They follow the 3R framework (Bolden and smith,2017) derived LAL with Rfc for endotoxin test (**Replacement, Reduction, Refinement**), leading to the sustainable use of animals for testing.

Conclusion

Well, developed healthy horseshoe crabs play a significant role in restoring and maintaining the environment and ecosystem. For over 40 years, the LAL Industry /Manufacturing Company have been distributed on the East Coast. Still, only the need for reagents is high due to millions of LAL tests producing COVID-19 vaccines per year. It is making a golden sign to save millions and billions of people through the LAL BET supply chain. Based on scientific facts, pros and cons are there about LAL industry, but if they balance both People's life and habitat in optimistic approach. Create a tremendous sustainable aquatic environment without tearing down the precious horseshoe creature. Efforts should be made by creating public awareness, educating fisher folks, providing alternative sites for boat building and repairing, and, if required, enacting laws to protect these precious guests from the brink of extinction from our coast.

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