Living Fossils

Horseshoe Crabs

Blue-blooded Survivors

Blue-blooded human aristocrats are proud of their lineage that can be traced back to many generations. By that token at least, they should be honoured to acknowledge the Horseshoe crab as a literally blue-blooded peer with a lineage pre-dating the Dinosaurs.

These animals can claim a history that reaches back almost half a billion years. In 2008, a paper in the British journal Palaeontology, reported that a team of Canadian scientists had found Horseshoe crab fossils from 445 million year-old rocks in central and northern Manitoba, Canada. The new fossil species was named Lunataspis aurora. It lived at a time when plant and animal life on land was just getting established. Scientists think that even older fossils may exist that will push back Horseshoe crab lineage to 490 million years.

In 1588, British naturalist Thomas Hariot named these “Horse-foot” crabs, which over time, was changed to “Horseshoe.” Horseshoe crabs are Arthropods and belong to Class Merostomata (from the Greek words mero, meaning leg, and stoma, or mouth). Although called “crabs,” they’re not crabs but distant cousins to spiders and scorpions.

Their close relatives were the Trilobites that existed 544 million years ago. Horseshoe crabs are currently represented by four living species. The Atlantic Horseshoe crab is called Limulus polyphemus. The Japanese Horseshoe crab is called Tachypleus tridentatus. The two species that occur along the east coast of India are Tachypleus gigas and Carcinoscorpius rotundicauda. All the four species look essentially similar. The upper side of the body is entirely covered with a hard, horseshoe-shaped shell, and it has a long, spinelike tail. Its blood contains a copper-based respiratory pigment called hemocyanin that gives the blood a bluish hue.

It is awe-inspiring to realize that since pre-history, despite the massive re-organization of the Earth’s surface into the continents we recognize, Ice ages and the many extinction events, Horseshoe crabs have survived. Actually, they are very much what they looked like millions of years ago. This is precisely why Horseshoe crabs are called “Living fossils.” As David Rudkin, Royal Ontario Museum, Toronto succinctly sums it up, “They made it through all of these events, not necessarily unscathed, but in a continuously recognizable form.”

Despite their hoary lineage, it has been estimated that fishermen chop up 20,000 to 25,000 Horseshoe crabs per year as bait. They are also caught for use by the pharmaceutical industry. A protein in the blood of the Horseshoe crab provides a valuable medical product critical to maintaining the safety of many drugs and medical devices. This protein is used to test products for the presence of bacterial toxins that can cause fevers and which can even be fatal to humans.

Japan has built the world’s first-ever Museum dedicated to the Horseshoe crab. This is the Kasaoka City Horseshoe Crab Museum built in 1990 to promote appreciation and interest in the conservation of Tachypleus tridentatus. In addition to educational exhibits, the museum rears Horseshoe crab larvae for release into the wild. Museum scientists use radio telemetry to track migration patterns, identify over-wintering grounds, and locate potential spawning beaches. Since habitat destruction and over-exploitation are major threats for these animals, it is hoped that the Museum’s efforts will help this ancient coastal creature retain its tenuous hold on life.

Dr Sukanya Datta
Scientist, NISCAIR, posted to Director General’s Technical Cell, CSIR HQ
Email: sukanya@csir.res.in