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## **New research finds surveys of larval-stage organisms effective for measuring marine biodiversity**

### ***BU biologist discovers diversity in mantis shrimp underestimated***

(Boston) -- There is a push to document the biodiversity of the world within 25 years. However, the magnitude of this challenge is not well known, especially when it comes to vast and often inaccessible marine environments. To date, surveys of species diversity in the world's oceans have focused on adult organisms, but new research from Boston University has found that studying marine life in its larval phase with DNA barcoding is a valuable way to estimate biodiversity.

Using this novel approach, Paul Barber, an assistant professor of biology at BU, discovered that biodiversity is greatly underestimated in the region of the Pacific known as the "Coral Triangle" and in the Red Sea. The study, which focused on coral reef-dwelling mantis shrimp (stomatopods), is the first to compare larval stage organisms to adults.

Through DNA barcoding – a new method not commonly used in aquatic settings – Dr. Barber and his colleague, Sarah Boyce of Harvard University, compared the DNA sequences of a random sampling of stomatopod larvae to a sequence database of most known mature species of mantis shrimp. The comparisons revealed numerous new varieties of shrimp that are completely unknown in their adult forms.

"Our results show that biodiversity in mantis shrimp in these regions is estimated to be at least 50 to 150 percent higher than presently believed," said Barber. "Given that few groups of marine organisms are as well studied as mantis shrimp, the biodiversity in other groups is likely even more poorly known. What's unique about this study is that we didn't just discover new species, we used DNA barcoding to quantify how much biodiversity is out there that we don't know about."

According to Barber, the results suggest that examining marine life in the larval stage offers a new and highly effective way to estimate biodiversity since most organisms have a developmental phase where minute larvae disperse on ocean currents.

"For some groups of organisms, scientists can more easily collect larvae for sampling since the habitats of the mature marine species can be totally unreachable," said Barber. "This method gives us a better idea of how well we know a particular area. There may be parts of the world that we think we know a lot about, like the Caribbean for example, but the sequencing of larva there may uncover countless more species that we never knew existed."

In addition to an alternative way to explore marine biodiversity, Barber hopes the findings will promote conservation. Despite being considered a "biodiversity hotspot," the Coral Triangle is one of the most threatened marine environments in the world. Often areas with particularly high rates of biodiversity are targeted for conservation, so the new method could help by highlighting potential regions for protection.

Barber also believes this new information will move scientists one step closer to the goal of documenting the entire world's species, both in aquatic and terrestrial settings.

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Recently published online, the study will appear in the August 7, 2006 issue of Proceedings of the Royal Society B: Biological Sciences.

Boston University's Marine Biology Program is located in Woods Hole, MA, on Cape Cod. The site provides faculty and students with access to diverse estuarine and marine habitats and the opportunity to conduct research involving tidal, deep-ocean, and salt marsh environments. Faculty also maintain field research programs worldwide, including the central Pacific, the Caribbean, the interior of Mexico as well as the Gulf of California off the Baja Peninsula, the Great Barrier Reef, and the Red Sea.

Founded in 1839, Boston University is an internationally recognized institution of higher education and research. With more than 30,000 students, it is the fourth largest independent university in the United States. BU contains 17 colleges and schools along with a number of multi-disciplinary centers and institutes which are central to the school's research and teaching mission.

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