Rutgers biologist to study worms in Amazon, glaciers

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Look out, Indiana Jones. Dan Shain is redefining the term "summer action hero" with voyages to frozen glaciers and the steamy Amazon planned, all in the name of scientific research.

Like the cinematic icon, Shain, an associate professor of biology at Rutgers—Camden, travels to exotic locales, overcomes unexpected challenges, and returns home with treasure. He's mined for ice worms atop glaciers in subzero weather; stood in leech-infested tropical waters; and studied aspects of life that could appear on other planets.

On July 30, Shain departs for Alaska, where he will trek through nearly 100 miles of pristine wilderness to study ice worms in Denali National Park. Along with Brad Parry, a Rutgers—Camden graduate biology student, Shain will tackle Eldridge Glacier and two weeks' worth of hiking and pack-rafting on the Tokositna River.
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"It's a bit of a crazy trip," admits the Rutgers—Camden scholar. "This is some of the most rugged country in Alaska, and we'll be roped up most of route. Nonetheless, it seems necessary to solve one of the big ice worm mysteries, namely whether or not ice worms are in Denali National Park. Last year I went on an expedition with National Geographic that failed to answer that question. We've heard lots of rumors, at least some of which are from semi-reliable sources, but no pictures or specimens to speak of."

An ice worm in the Alaska Range would almost certainly be a species

new to science, since "typical" coastal ice worms could not tolerate the extreme cold of Alaska's interior during winter, says Shain, whose ice worm research has earned a new three-year, $326,733 grant from the National Science Foundation to support his project "RUI: Energy Anabolism in Glacier Ice Worms: Evolution, Mechanisms and Contribution to Cold Adaptation."

Shain's next adventure starts in late August, when he embarks on a five-month journey within the heart of the Amazon to collect live specimens of a monster earthworm that reaches up to six feet in length.

It's all part of the Rutgers-Camden scholar's commitment to extending knowledge of leech and worms. Shain's expeditions in pursuit of the ice worm (a creature who lives within frozen glaciers) have been chronicled by National Geographic. Now, with the support of a $12,000 Fulbright Lecturing/Research Grant, Shain will seek to capture the giant earthworm *Rhinodrilus priollii*.

Shain will maintain a small colony of the worms in their native Brazil with the aim of observing their reproductive behavior, and specifically the elaborate process of cocoon secretion which is difficult to visualize in typical earthworms and leeches. The cocoon itself will also be examined and compared with other worm cocoons.

"I'm hoping to gain insight into the cocoon secretion mechanism (comparable in complexity, perhaps, to spinning a spider web), and to our collective data on the biomaterial aspects of different parts of worm cocoons, mainly as flexible, resilient membranes and bio-adhesives (usually underwater adhesives, but not in this case)," says Shain. "I will also do some 'forensic' work on the giant earthworms to gain some understanding of their movements over geological time, and which other species represent their closest living relatives."

Shain teaches undergraduate and graduate courses in biology at Rutgers-Camden, where he joined the faculty in 1999. He has received numerous grants from such organizations as NASA and the National Institutes of Health in support of his research into leech, ice worms, and other invertebrates.

A graduate of the University of New Hampshire, where he earned both his bachelor's and master's degrees, Shain earned his doctorate from Colorado State University and held a postdoctoral fellowship through the National Institute of Health at the University of California-Berkeley.

Source: Rutgers University