

Mexico's ancient native plants and a new invasive insect threat

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Professor Benjamin Normark will spend the fall 2016 semester in Mexico documenting the spread of the insect, cycad aulacaspis scale. It is an invasive species that threatens the country's cycads, plants sometimes called 'living fossils' because they have changed little in the last 280 million years. Credit: UMass Amherst

Benjamin Normark, professor of biology at the University of Massachusetts Amherst, was recently selected as a Fulbright scholar and will spend the fall 2016 semester in Mexico documenting the spread of the insect, cycad aulacaspis scale. It is an invasive species that threatens the country's cycads, plants sometimes called "living fossils" because they have changed little in the last 280 million years.

Globally, says Normark, "Cycads are under unprecedented assault from armored scale insects and from the global nursery trade that sees [cycads](#) as commercially valuable ornamentals." The plants superficially resemble palms, and are sometimes called 'sago palms,' but they constitute their own ancient branch of the plant family tree.

He adds, "So far, the insect is not known to have invaded any rural nurseries or sites where endemic Mexican cycads grow, but the threat is a sobering one for conservation of Mexican plant diversity."

Mexico is home to 55 of the world's 300 cycad [species](#). Most of these are vulnerable or endangered, and many are culturally important, valued for stems that can be pounded into an edible meal, and for their foliage, still used for traditional religious ceremonies.

In addition to assessing the spread of this [invasive species](#), he and two colleagues, Angelica Cibrian-Jaramillo at Mexico's Laboratorio Nacional de Genómica para la Biodiversidad and Andrew Vovides at Instituto de

Ecología, will survey the biodiversity of other armored scale insect species associated with Mexico's cycads. Armored scale insects are an economically important group that include many pest species, and have been poorly studied there.

The researchers will travel to sites where cycads grow and collect scale insects both from the cycads and from other plants in the same habitats. UMass Amherst students will later prepare DNA and microscope slides from the insect specimens, allowing Normark to identify all the species and to describe any new ones that may be encountered. As Normark notes, the diversity of Mexican armored scale insects is poorly understood. Though 232 species have been reported, almost all are from a handful of coastal states and most are known only from old records that lack detailed information.

Cycad aulacaspis scale is native to Southeast Asia, and has been highly destructive to cycads in many areas of the world where it is invasive, including Pacific islands, South Africa, and Florida.

In North America, he says, cycad aulacaspis scale was first reported in Florida in 1996 and went on to severely damage cycad horticulture and threaten remnant populations of native cycads. "Cycads are probably the world's most endangered group of plants," Normark says, and "armored scale insects are probably the world's most invasive group of insects."

Though this work is aimed primarily at information gathering rather than intervention, he and his colleagues are eager to establish the groundwork for eventual biological controls. To that end, he plans to collaborate with UMass Amherst entomologist Roy Van Driesche, an expert in such controls, who is also familiar with the Mexican terrain being studied.

Normark reflects that "a foreign scientist collecting specimens has a particular obligation to ethical and considerate conduct." He plans to

deposit type specimens, known as holotypes, of any new species found in collections at the Mexico's national insect collection, Instituto de Biología and Universidad Nacional Autónoma de México, for example. Further, "In naming new any species, I will seek to apply culturally appropriate names, including local geographic or indigenous names," he adds.

Provided by University of Massachusetts Amherst

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