Plant found to prefer pollination during the full moon

April 2 2015, by Bob Yirka

Ephedra distachya subsp. monostachya (L.) Riedl., female plant with ripe cones. Habitat: chalk exposure. Vicinity of Saratov city, Russia. Credit: Le.Loup.Gris/Wikipedia

(Phys.org)—A pair of researchers with Stockholm University has discovered a species of *Ephedra*—a plant that is dependent on the full moon for pollination. In their paper published in *The Royal Society*

Biology Letters, Catarina Rydin and Kristina Bolinder describe how they came upon their findings nearly by accident and the research they conducted afterwards that backed up their suspicions.

To reproduce, plants produce pollen which is carried (by wind, insects, animals, etc.) to other plants of its kind where it fertilizes seeds. As the research pair note, species of *Ephedra* are pollinated via both insects and the wind, but only one thus far (*Ephedra foeminea*) prefers pollination by full moonlight. The two made this discovery after a fruitless study of the plants in Greece and Croatia, it hit them that the plants might be waiting for more light from the moon— *E. foeminea* was already known to be pollinated by nocturnal insects, perhaps they had found they had better luck when there was more moonlight. They returned to the Balkans during the time period when the moon would be full, and found fields that looked like they were full of twinkling diamonds. Intrigued, they returned to Sweden and began studying records of the plant and found a correlation between pollination times for the plants and full moon periods.

E. foeminea, a gymnosperm, produces a clear sugary substance which oozes out of cone-shaped female organs, forming globules. When an insect lands on the globule, it carries with it pollen that sticks to the substance, and eventually the pollen makes its way to a seed at the base of the organ, fertilizing it. The globules, the researchers note, glisten brightly in the full moonlight, attracting insects. They also acknowledge that they have no idea how it is the plants know when the full moon is going to happen, or react when it actually does happen, though they suggest it might be related to the gravitational impact the moon exerts during that time. In any case, the finding is a first for the plant world—no other plant has been found to wait for the full moon to activate a pollinator inducement, including *Ephedra distachya*, a very close relative, which relies on wind to carry its pollen.

More information: Moonlight pollination in the gymnosperm Ephedra (Gnetales), *Biology Letters*, Published 1 April 2015. DOI: 10.1098/rsbl.2014.0993

Abstract

Most gymnosperms are wind-pollinated, but some are insect-pollinated, and in Ephedra (Gnetales), both wind pollination and insect pollination occur. Little is, however, known about mechanisms and evolution of pollination syndromes in gymnosperms. Based on four seasons of field studies, we show an unexpected correlation between pollination and the phases of the moon in one of our studied species, Ephedra foeminea. It is pollinated by dipterans and lepidopterans, most of them nocturnal, and its pollination coincides with the full moon of July. This may be adaptive in two ways. Many nocturnal insects navigate using the moon. Further, the spectacular reflection of the full-moonlight in the pollination drops is the only apparent means of nocturnal attraction of insects in these plants. In the sympatric but wind-pollinated Ephedra distachya, pollination is not correlated to the full moon but occurs at approximately the same dates every year. The lunar correlation has probably been lost in most species of Ephedra subsequent an evolutionary shift to wind pollination in the clade. When the services of insects are no longer needed for successful pollination, the adaptive value of correlating pollination with the full moon is lost, and conceivably also the trait.