

Bug of the Month

by Jim Revell / November 2015

Yucca Moth (*Tegeticula yuccasella*)

YUCCA MOTH

Class:	Insecta (Insects)
Order:	Lepidoptera
Family:	Prodoxidae (Yucca Moths)
Genus:	Tegeticula (Yucca Moth)
Species:	yuccasella



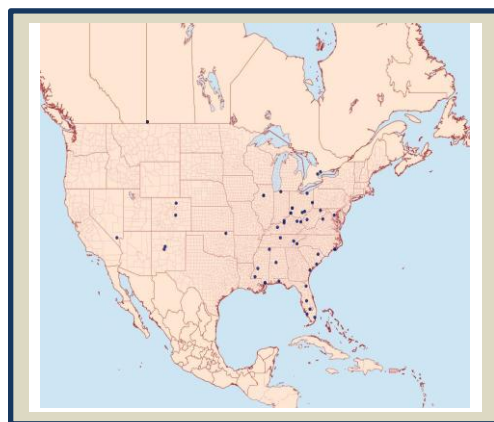
Our “bug” this month comes by way of an article in the May/June 2015 issue of *The American Gardener* magazine. Jeff Goggin brought the article by to see if I would be interested in reading it. It came as no surprise that I was, and his timing was perfect as I had not yet decided which bug I was going to write about this month.

After reading the article by George Ellison (who lives in Asheville, North Carolina), I became even more fascinated and started researching the Yucca Moth. I found that **each species of the Yucca plant must be pollinated by the Yucca Moth**, either the genus of *Tegeticula* or *Parategeticula* from the family Prodoxidae (Yucca Moths).



There are 56 species of Yucca Moth in nine genera in two subfamilies in North America. In the genus *Tegeticula*, there are 3-14 species (depending on the list you research). *T. yuccasella* is a tiny grayish-white moth with bronze underwing margins. Species of this genus (*Tegeticula*) have a very distinct feature of several tentacles around the mouth instead of the typical siphon tube (a characteristics of most moths). This tentacle feature serves as a major pollination function.

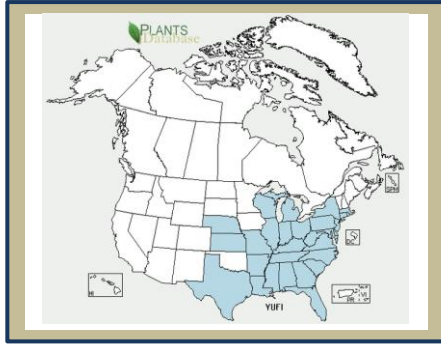
The map at right depicts the **geographic range of *Tegeticula yuccasella***, from North American Moth Photographers Group at the Mississippi Entomological Museum (located at Mississippi State University). An accompanying table indicated sightings in Virginia are in the month of June.



Yucca plants are part of the Asparagus family (Asparagaceae) which includes agaves and false yuccas (*Hesperaloe* spp.) and are in the genus *Yucca* which has ±45 species. *Yucca filamentosa*, also known as Adam’s Needle, Common Yucca, Spanish Bayonet and Needle-Palm, among other names, is native to the southeastern

U.S. It ranges from West Louisiana to the east coast, from central Florida to southeast Virginia. See below map (“Native Status of *Yucca filamentosa* in the USA”) provided by the USDA Natural Resources Conservation Service.

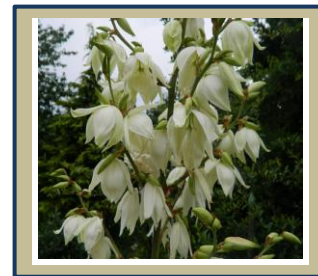
The Yucca plant is a trunkless, multi-suckering evergreen shrub, with flower stems reaching 10 feet and masses of cream-colored flowers arriving in early summer.



In 1794, Thomas Jefferson planted *Yucca filamentosa* at Monticello, listing the plant as “beargrass” (see recent photo, above far right, of a Yucca plant at Monticello).

The bell-shaped flowers of the Yucca plant have six pollen-tipped male stamens that surround a central female pistil. Since these are located much lower and angled away from the stigmatic cup, self-pollination is almost impossible.

Pollination occurs when the female moth visits a Yucca flower at night, gathering pollen grains from the anthers. She rolls them into a ball, tucking it under her head and flies to another flower on a different plant. If she detects a previous visitor to that flower, she moves on to another flower. Here, she deposits her eggs inside the ovary at the base of the flower. At the other end of the pistil, she carefully packs the pollen ball into the stigmatic cup using her specialized tentacles. This allows fertilization of the Yucca plant, producing hundreds of seeds.



In the photos below, two *Tegeticula yuccasella* moths visit a Yucca blossom, and a *Tegeticula yuccasella* deposits a pollen ball onto the stigma of a Yucca plant.



Developing larvae in the ovary consumes a portion of the ripening Yucca seeds, leaving more than enough to assure plant reproduction.

After a few weeks, the fully grown larva drops to the ground and buries itself, making a silken cocoon. It stays in the cocoon until Spring when the Yucca plant begins to bloom. Upon hatching,

the male and females meet at the flowers to mate; soon after, the males die. In case the Yucca plant doesn't bloom (due to adverse weather conditions or other factors), some larvae will remain dormant for more than a year in the ground. This guarantees moths will be available when the plant does bloom.

Biologists have a term for the relationship Yucca Moths have with Yucca plants - - it is called **“Obligate mutualism”** and means both plant and insect species are interdependent and will not survive without their interaction.

Research References / Resources:

<http://bugguide.net/node/view/45697?printable=1>
<http://www.plants.usda.gov/java/ClassificationServlet?source=display&classid=YUCCA>
<https://en.wikipedia.org/wiki/Tegeticula>
“The Yucca and Its Moth” by George Ellison, published in *Natural Connections*, May/June 2015
“Yucca Moths and Yucca Plants: Discovery of ‘the Most Wonderful Case of Fertilization’” by Carol A. Sheppard and Richard A. Oliver, *American Entomologist*, Spring 2004
http://www.fs.fed.us/wildflowers/pollinators/pollinator-of-the-month/yucca_moths.shtml
<https://www4.uwm.edu/fieldstation/naturalhistory/bugoftheweekly/yuccamoth.cfm>

Photo References:

First feature photo / Tegeticula yuccasella:

bugguide.net/node/view/759695 (photo by Jean Obrist, Cocke Co., TN)

Second feature photo / Tegeticula yuccasella:

mothphotographersgroup.msstate.edu/Species.php?hodges=198&state=VA
(photo #MEMO198-300-25-TX-RLB at Mississippi Entomological Museum)

Map/geographic range of Tegeticula yuccasella:

mothphotographersgroup.msstate.edu/large_map.php?hodges=198 (N.A. Moth Photographers Group at the Mississippi Entomological Museum at Mississippi State University)

Map “Native Status of Yucca filamentosa in the USA,” USDA Natural Resources Conservation Service, Public Domain, via USDA PLANTS Database: <https://wizzley.com/yucca-filamentosa-adams-needle/>

Yucca filamentosa plant (grass and flowers) in full bloom: www.sezarcom.com/catalogue/special/

Yucca filamentosa planted by Thomas Jefferson in Monticello 1794 (he listed as “beargrass”):

<https://wizzley.com/yucca-filamentosa-adams-needle/>; photo by Kafka4prez, CC BY-SA 2.0, via Flickr

Close-up of Yucca filamentosa blooms in garden: <https://wizzley.com/yucca-filamentosa-adams-needle/>; photo by Manu (lilli2de), CC BY-SA 2.0, via Flickr

Tegeticula yuccasella on Yucca filamentosa blossom:

www.discoverlife.org/IM/I_AMC/0029/mx/tegeticula_yuccasella,_on_yucca_filamentosa,_smith-jones_property,_van_buren_county,_tennessee_2,I_AMC2937.jpg

Tegeticula yuccasella depositing pollen ball onto stigma of Yucca plant:

<https://upload.wikimedia.org/wikipedia/commons/3/3e/Tegeticulla.jpg>; photo by Sherwin Carlquist, CC BY-SA 3.0, via Wikimedia Commons (appeared in article at <https://wizzley.com/yucca-filamentosa-adams-needle/>)

Jim Revell is a Bedford Extension Master Gardener Volunteer.
Read more of his articles on the “Jims Bugs” page @ www.BedfordMasterGardeners.org