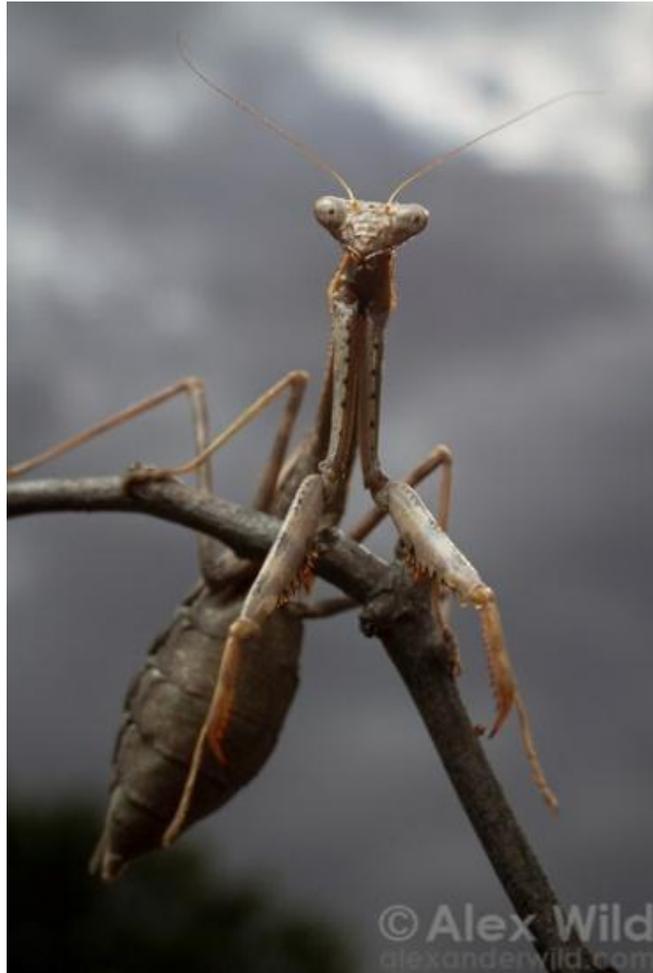


## *Stagmomantis carolina* (Carolina Mantis)

Order: Mantodea (Mantids)

Class: Insecta (Insects)

Phylum: Arthropoda (Arthropods)



**Fig. 1.** Carolina mantis, *Stagmomantis carolina*.

[<http://www.alexanderwild.com/Insects/Insect-Orders/Magnificent-Mantids/i-5Zgzcxw/2/L/Stagmomantis7-L.jpg>, downloaded 29 March 2015]

**TRAITS.** Medium to large sized mantid averaging 50-65mm in length at adulthood (Harris and Moran, 2000). Large, front-facing eyes (Fig. 1), which are adapted to vision in daylight and allow for the estimation of distance of stationary objects (Kral, 2012). Long and slender legs and antennae with a highly developed pair of large, serrated, spiny forelegs which are held in a “praying” position for the capture of prey (Teyssier, 1997). The head and prothorax are connected with a flexible membrane allowing for almost full rotation of the head (Rau and Rau, 1913). Long thorax which combined with the head length is almost as long as the abdomen. Males have slender long abdomens with wings that are fully functional whereas females’

abdomen is shorter and very broad with non-functional wings (Fig. 2). Wings are short especially in females where they do not cover the abdomen (Schulz, 2012). Colour: varies within the range of mottled brown to yellow-green with bright green legs and wing covers (Blatchley, 1920).

**DISTRIBUTION.** Widespread throughout warm, temperate and tropical regions within southern, northern and Central America. They are the most abundant native mantids in North America (Things Biological, 2012). Some examples of countries within this range which the species is native to include: Trinidad, Venezuela, Guatemala, Belize, Costa Rica, Mexico, Panama and USA (Wikipedia, 2015).

**HABITAT AND ACTIVITY.** Makes use of grasslands as well as woodlands, in areas with many flowering plants based on their high diversity and density of arthropods as a food source. Can also be found in gardens due to the same feeding aspect of the flowering plants (Paredes, 2001). Due to their very sedentary lifestyle a Carolina mantis may spend its entire life in a single tree or meadow once the food supply is constant and abundant. In optimum habitat conditions their level of movement may only increase during mating periods, more so in males who fly in search of potential mates. Like most mantids this species is diurnal however may still be active at night (Hurd, 1999).

**FOOD AND FEEDING.** Both adults and nymphs are completely carnivorous. They are generalist predators feeding on an array of small animals such as flies, moths, butterflies, wasps, caterpillars and have even been reported to prey on adult hummingbirds (Lorenz, 2007). Mantids obtain prey by quietly waiting and attacking nearby insects using the forelegs. This is also the reason the Carolina mantids inhabits flowering plants as the flowers are frequently visited by feeding insects which are then attacked by the awaiting mantids. On rare occasions, these mantids may stalk prey such as ants (Preston-Mafham, 1993). Like all other mantids this species also exhibits cannibalism especially the nymphs and female adults (Hurd, 1999).

**POPULATION ECOLOGY.** Like other mantids it is a solitary species and may only interact with other members of the species when mating (Hurd, 1999). These abundant mantids have a lifespan of about 10 months to a year. Nymphs mature 4-5 months after hatching and die 3-8 months after reaching maturity. In captivity however they may survive up to 14 months (Rau and Rau, 1913).

**REPRODUCTION.** Mating is seasonal occurring usually in October and November. Males usually seek out females in order to mate however females may compete for male mates. Coitus, in captivity, almost always occurs during daylight hours for a duration of 6-8 hours but may be less or even extend up to 15-18 hours (Rau and Rau, 1913). Sexual cannibalism is also observed, whereby female mantids have been observed to eat males during courtship or mating when in captivity. Well-fed females do not attack their mates as often. Data on mating patterns and whether or not frequent sexual cannibalism occurs in natural conditions is unavailable (Hurd, 1999). This species is oviparous or egg laying. One or more egg pods are produced which each weigh about a third of the adult's body weight. This can be inferred as the reason for the voracious hunger which drives the female to devour her mate as it would be the most accessible and easiest prey available (Price, 1984). Eggs are surrounded by a casing of liquid foam, which is an abdominal gland secretion that hardens to create a protective shell called an ootheca (Fig.

3). More than two hundred mantid nymphs may emerge from a single egg casing (Rains, 2010). After laying of eggs the female usually pays no more attention to the offspring (Rau and Rau, 1913). In temperate environments adults die in winter leaving eggs which hatch the following spring. There is also cannibalistic behaviour observed between the developing nymphs. In subtropical climates, there is only one documented report of overlapping generations in Florida (Hurd, 1999). Mantid nymphs hang by threads from the ootheca after emerging until their outer skin hardens and may undergo 5-10 moults before maturing about five months later (Rains, 2010).

**BEHAVIOUR.** In adulthood only females display cannibalism. The nymphs also showed cannibalism amongst each other after hatching however it is uncertain whether it is only females or all nymphs as they are sexually indistinguishable at this stage (Rau and Rau, 1913). Anti-predation is achieved through camouflage as the mantid colour serves as a protective agent. The green and mottled-brown colours of the species may be disguised within foliage and their long slender appendages may be mistaken for twigs (Rau and Rau, 1913). This allows these mantids to conveniently hide from possible predators as well as conspicuously stalk prey. These mantids possess the ability to detect high frequency sounds, such as those produced by bats, via “ears” on their body, and alter their flight pattern accordingly (Yager, 1999).

**APPLIED ECOLOGY.** Not listed by IUCN. Very abundant especially in the United States (Lyon, 2000). As a generalist predator this species consumes many insects many of which are agricultural pests. Often sold for use in gardens however it has not yet been used for large scale biological control (Hurd, 1985). Their predaceous nature may also be a negative attribute as many consumed organisms may be beneficial, such as pollinating wasps and bees (Hurd, 1999).

## REFERENCES

- Blatchley, W. S. (1920). Orthoptera of Northeastern America, with Especial Reference to the Faunas of Indiana and Florida. Indianapolis: The Nature Publishing Company
- Harris and Moran. (2000). Life History and Population Characteristics of the Mantid *Stagmomantis carolina* (Mantodea: Mantidae). *Environmental Entomology*. **29(1)**:64-68.
- Hurd, L. (1985). Ecological Considerations of Mantids as Biocontrol Agents. *Antenna*. **9**: 19-22.
- Hurd, L. E. (1999). Ecology of Praying Mantids. *The Praying Mantids*. Maryland: Johns Hopkins University Press.
- Kral, K. (2012). The Functional Significance of Mantis Peering Behaviour. *Eur. J. Entomol.* **109**: 295–301
- Lorenz, S. (2007) Carolina mantid (*Stagmomantis Carolina*) captures and feeds on a broad-tailed hummingbird (*Selasphorus platycercus*). *Bulletin of the Texas Ornithological Society*. **40**: 37–38.
- Lyon, W. (2000). Praying Mantis. <http://www.ag.ohio-state.edu/~ohioline/hyg-fact/2000/2154.html>, downloaded 1 March 2015.
- Paredes, A. (2001). *Stagmomantis Carolina*. [http://animaldiversity.org/accounts/Stagmomantis\\_carolina/#e45def61b6c6cc14f2db91a85a0d6be7](http://animaldiversity.org/accounts/Stagmomantis_carolina/#e45def61b6c6cc14f2db91a85a0d6be7), downloaded 8 March 2015.
- Preston-Mafham, R. (1993). The Encyclopaedia of Land Invertebrate Behaviour. Massachusetts: The MIT Press.
- Price, P. (1984). Insect Ecology (2nd edition). New York: Wiley-Interscience.
- Rains, B. (2010). Nature's Praying Predator. <http://mdc.mo.gov/conmag/2005/03/natures-praying-predator>, downloaded 21 March 2015.
- Rau, P. and Rau, N. 1913. The Biology of *Stagmomantis Carolina*. *Transactions of the Academy of Science of St. Louis*. **22(1)**: 1-58.
- Schulz, K. (2012). Brief Summary of *Stagmomantis Carolina*. [http://eol.org/data\\_objects/17781359](http://eol.org/data_objects/17781359), downloaded 1 March 2015.
- Teyszier, J. (1997). The Devil's Riding Horse. *Canadian Geographic*. **117**: 44-50.

Things Biological. (2012). Particularly High Local Populations of Green Carolina Mantids (*Stagmomantis carolina*). <https://thingsbiological.wordpress.com/2012/09/21/particularly-high-local-populations-of-green-carolina-mantids-stagmomantis-carolina/>, downloaded 4 March 2015.

Wikipedia. (2015). Carolina Mantis. [http://en.wikipedia.org/wiki/Carolina\\_mantis](http://en.wikipedia.org/wiki/Carolina_mantis), downloaded 15 March 2015.

Yager, David D. (1999). Hearing. *The Praying Mantids*. Maryland: Johns Hopkins University Press.

Author: Isabella Salazar

Posted online: 2015



**Fig. 2.** Sexual dimorphism between male and female Carolina mantids.

[<https://thingsbiological.wordpress.com/2011/09/11/an-abundance-of-carolina-mantids-stagmomantis-carolina/>, downloaded 29 March 2015]



**Fig. 3.** *Stagmomantis carolina* nymphs newly emerged from the ootheca.

[<http://blogs.ket.org/classsync/?tag=ootheca>, downloaded 29 March 2015]

For educational use only - copyright of images remains with original source