

Anartia amathea (Scarlet Peacock Butterfly)

Order: Lepidoptera (Butterflies and Moths)

Class: Insecta (Insects)

Phylum: Arthropoda (Arthropods)



Fig. 1. A male scarlet peacock butterfly, *Anartia amathea*.

[<http://www.ttnaturelink.com/quick-guides/butterflies-trinidad-gardens-scrubland>,
downloaded 11 September 2012]

TRAITS. *Anartia amathea* is a lightly built, medium sized butterfly with a wing span of approximately 4 cm. The base colour of the wings is either dark brown or black and there are usually three large red spots located near the base of the lower wings. The males have a distinct red coloration (Fig. 1), whereas the females are slightly larger and orange (Fig. 2). Butterfly wings are covered with tiny scales which reflect light, which is observed as their coloration. The orientation of these scales also aids in thermoregulation, which is regulation of body heat (Murray, 2010, pg 9). Both sexes possess a band that spans both the top wings and part of the lower wings with a series of white spots. The underside of this butterfly is almost identical in pattern but much paler in colour than the top (Fosdick, 1973). The markings that are black on the top surface of this butterfly are pale brown on the underside. The head is small and the antennae are slender and slightly shorter than the length of the body. Adult life is short, spanning somewhere in between one and two weeks (Silberglied et al, 1980). The flight pattern of this butterfly is described as jaunty yet somewhat erratic, with a flight height between approximately 2-5 m above ground. Once this butterfly alights on a surface, usually vegetation, it spreads its

wings and orient towards the sun so that it can thermoregulate. When conditions are overcast however, it orients in a random direction (Fosdick, 1973). Several vernacular names are given to this butterfly in Trinidad and Tobago (Winer, 2009, pg 1004) and other Caribbean islands. Other names are the red anartia or scarlet peacock butterfly (Silberglied et al, 1980).

ECOLOGY. At the beginning of the rainy season, this butterfly can be observed in the hundreds wherever flowers are in bloom and is most likely the commonest butterfly found in Trinidad (Barcant, 1970). Including Trinidad and Tobago, this butterfly has a vast geographical range, within the subtropical and tropical areas of Latin America; Central and South America, also included are other Caribbean islands of the lesser Antilles (Antigua, Barbados and Grenada) (Smith et al, 1994, pg 87). Within these areas, this butterfly is usually found wherever there are larval food plants and available nectar sources; usually plants of the family Acanthaceae. Human activity is beneficial to this species as their foodplants grow along drain ditches and irrigation, and large numbers are generally found in agricultural areas (Silberglied et al, 1980).

SOCIAL ORGANIZATION. Sets of adults may shelter, feed and mate within the same areas, but no form of structured grouping is known in *Anartia amathea* as is common to other tropical butterflies (Silberglied et al, 1980). These butterflies often roost in groups on the underside of leaves in the late evening, and roosting is done in an upside down manner with their wings closed (Fig. 3). Roosting in communities such as this is probably for the purpose of giving added protection from predators (Emmel 1975, pg 51).

ACTIVITY. *Anartia amathea* is a diurnal (active during the day) species. It is mostly active during sunshine and flutters around in areas that are dry and hot and areas of low herbaceous vegetation. Adults may leave otherwise suitable areas if there are no sources of nectar. They are also active during light rain showers and hide in low foliage areas during heavy showers. They are usually seen flying with *Junonia* spp., commonly known as the mangrove buckeye (another butterfly of the family Nymphalidae that is of similar size that has a series of eyespots on its wings), as they share similar food resources. Females searching for oviposition (egg laying) sites fly very closely to short vegetation and land often and briefly on a range of plants (Silberglied et al, 1980).

FORAGING BEHAVIOUR. This butterfly feeds on the nectar of the herbaceous plants of the family Acanthaceae (Silberglied et al, 1980) like the small flowers of the rock sage plant for example (Winer, pg 245) using its proboscis (elongated, tubular mouthpart). While it feeds, it can be observed slowly fluttering its wings.

COMMUNICATION. It is suggested that these butterflies have the ability to see colours and seeing the colour red may play an important role in social behaviours such as mating for example (Silberglied et al, 1980). Communication is also achieved by the release of pheromones (chemical hormones that are released externally to influence the behaviour of the impacted individual) for the purpose of mating (Preston-Mafham and Preston-Mafham, 1993, pg 106).

SEXUAL BEHAVIOUR. It is known in the animal kingdom, that the males of various species are usually brightly coloured for the purpose of sexual attraction of mates. The male *Anartia amathea* is more brightly coloured than the female and so it was assumed that this difference

played a major role in sexual attraction in these butterflies. Courtship starts with the female perched on a grass blade or leaf with her wings fully spread. A male fluttering by, will swoop in and flutter a few inches above the female. If successful, the male will walk forward with his abdomen bent laterally and mate with the female. If she is not interested however, she will take part in a “mate rejection ritual”, where she closes her wings and will shift from side to side. The male flutters away once he is rejected. An experiment was conducted on the *Anartia amathea* where the females had their orange bands coloured bright red to see the reaction of the males. This had no effect on the males and courtship followed just as intently as before (Fosdick, 1973). A separate experiment was conducted on the females to see if the bright red bands of the male influenced their choice of a mate. The bright red bands were concealed with black paint and what was discovered is that the females accepted these males just as readily as the brightly coloured males. It was then concluded that pheromonal stimuli in this species probably plays a greater role in reproduction than sight (Preston-Mafham and Preston-Mafham 1993, pg 106). This is also demonstrated by the fact that these butterflies are also known to mate with closely related butterflies in South America such as *Anartia fatima* for example, creating hybrids. Females usually copulate in the first two days of adulthood, but males copulate three days after becoming an adult. Males mate once a day but may mate for several days in succession. This species has a high fecundity (production of a large number of offspring) and each can lay several hundreds of yellowish green eggs of size approximately 0.65 to 0.70 mm in a few days, and a potential 800 eggs per female can be laid (Silberglied et al, 1980).

JUVENILE BEHAVIOUR. The majority of a butterfly’s life is spent in the larval stage when it feeds on the vegetation of its host plant. *Anartia amathea* has five larval instars (stages) and then the pupa is formed (Silberglied et al, 1980). A caterpillar nearing pupation (Fig. 4) generally wanders about for a day then in the early evening or late afternoon prepares a platform of silk several centimetres above ground level on the underside of a leaf or a blade of grass. A silk stalk is then spun so that the pupa can hang from it. Once the stalk of silk is prepared, the caterpillar crawls forward till its tenth segment of legs are located above this stalk. This is done to shape and pull the stalk in order to support the jade green pupa during the final molt. The caterpillar then suspends in a “j” position until the next morning when ecdysis (shedding of the outer cuticle) occurs. The pupal period lasts inbetween six and eight days. A day or so before eclosion (emergence from the pupa) changes can be observed through the pupa. The eyes become brown and the wings can be observed as black. After emerging from the pupa, the newly formed adults are capable of flight in one or two hours (Silberglied et al, 1980). Males usually emerge a day before females and sperm maturation usually takes place during this time period (Fosdick, 1973).

ANTIPREDATOR BEHAVIOUR. Eggs are laid on the underside of leaves mostly likely as an effort to reduce their susceptibility to predators, but are still attacked when discovered. The caterpillars have numerous stout, black spikes (Riley, 1975, pg 76) most likely as a secondary morphological defence (Ruxton et al, 2004, pg 89), most likely to ward off predators as they are quite dull and show no aposematic (warning) colouration (Fig. 4). The adults are prey to a number of birds and other insectivorous creatures. These butterflies show what is known as false aposematic colouration. One study by suggests that they are “incipient Batesian mimics” (that is they possess the colouration of another toxic species although they themselves are not harmful) of *Heliconias erato*, commonly known as the postman butterfly, a species that insectivores avoid. This was proven when predators refused to consume *Heliconias erato* when it was offered

to them, and also refused *Anartia amathea*, due to the fact that they possess similar colouration although arranged in a completely different manner. (Silberglied et al, 1980). In another experiment, this butterfly, along with others from the *Anartia* genus was fed to chicks and the chicks fed on the other lightly coloured butterflies but avoided *Anartia amathea* it seems due to its colouration. This suggests that detection of aposematic colouration is somewhat an innate ability in predators (Ruxton et al. 2004, pg 90). This butterfly still suffers from great predation however as predatorial behaviour is learned, as shown in an experiment using *Muscivora tyrannus* (Forked tailed flycatchers). In this experiment if other birds are seen feeding on a butterfly that is otherwise assumed poisonous or distasteful (in this experiment *Anartia amaethea* was used) they will copy that behaviour and also begin to prey on that species (Alcock, 1969). Although there are huge losses in the numbers of eggs and/or adults, large numbers of these butterflies still exist due to their high fecundity (Silberglied et al, 1980).

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Fig. 2. A female *Anartia amaethea* with the characteristic orange coloration.

[http://www.chebucto.ns.ca/environment/NHR/lep_images.html downloaded 14 September 2012]



Fig. 3. Two *Anartia amathea* roosting on the underside of a blade of grass.

[<http://www.learnaboutbutterflies.com/Amazon%20-%20Anartia%20amathea.htm>

downloaded 13 September 2012]



Fig. 4. The caterpillar of *Anartia amathea*.

[<http://www.pybio.org/en/18808/galeria-de-larvas/> downloaded 14 September 2012]

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