Dryas iulia (Flambeau Butterfly)

Order: Lepidoptera (Butterflies and Moths)
Class: Insecta (Insects)
Phylum: Arthropoda (Arthropods)

Fig. 1. Flambeau butterfly, *Dryas iulia.*

[http://en.wikipedia.org/wiki/File:Julia_butterfly_(Dryas_iulia_iulia)_male.JPG, downloaded 23 March 2015]

TRAITS. *Dryas iulia* is a narrow-winged butterfly with a wing span of 82-92mm (Wikipedia, 2015). The base colour is orange with black markings; the black markings are mainly a black border around the wings. The males will have a distinct orange coloration (Fig. 1) whereas the females are slightly orange with more black markings. This long-winged butterfly also has a proboscis used to feed on nectar.

DISTRIBUTION. This species is native in Trinidad and Tobago, and it is also common throughout the Caribbean, Southern U.S.A, Central America and South America, with each area having its own endemic sub-species (Stiling, 1986).

HABITAT AND ACTIVITY. Found in forests, but are often encountered in disturbed open habitats like forest clearings, cattle pastures, along riverbanks and in flowery lowland gardens (Host, 2015). *Dryas iulia* is diurnal (active during the day). The males usually exhibit more activity flight than the females since most of their time is in chasing butterflies and courting

females. The females flight activity are considered shorter, they spend most of their time flying through vegetation. At night time they would roost in loose groups lower than 2 m above ground (Brown, 1981).

FOOD AND FEEDING. At larval stage (caterpillars) they can be a minor plague for the *Passiflora* plant. As an adult it feeds by "trap-lining" (each day, they feed along a learned, set route of nectar sources), on flowers like the shepherd's needle and lantana as well as other flowers. Additionally, the females will also feed on dissolved pollen (Cambridge Butterfly Conservatory, 2014) and there have been some observations that the male *Dryas iulia* consume the tears of Caiman (Fig. 2) and turtles (Fig. 3) for scarce minerals like salts and proteins (de la Rosa, 2014).

POPULATION ECOLOGY. In tropical regions, the males visit riversides and damp paths to indulge in "mud-puddling", feeding on dissolved minerals. Initially, one male will be at the suitable feeding spot; however the other males passing by seem to recognize their own on the ground and join them. After an hour or more, hundreds or thousands of butterflies may assemble at the particular mineral-rich area. Generally, various different species are present at the feeding places, but each species congregates as a discrete group. If a constant gentle breeze is present all the butterflies will face the breeze in order to avoid being blown away and lose their feeding spot to a competitor. Femalesy behave slightly different to the males, they are not found mud-puddling. Instead they are typically close to the nectar source they have to feed on for nutrients, essential for egg production. They are also close to the *Passiflora* plant species so that they will be able to maximize the success of offspring by making oviposition decisions. So far there is no form of structured grouping recorded for the females. What has been recorded thus far is that they are seen in pairs with the males for copulation.

REPRODUCTION. In looking for a mate, the male patrols and persuades the female by using many behavioural acts which can be catalogued into pre-coupling and post-coupling. In the pre-coupling the behavioural acts are mainly done by the males using their wings to attract the females. When they are successful in attracting a female, genital coupling happens on the ground and the sperm transfer begins. After coupling, a stage called "coupling rotation" occurs this is when the male moves his body which is in the opposite direction to the female. The next stage is called "copulatory protection"; this is where the male places his wings outside the female's wings, protecting the mating plug and female's abdomen. Separation of the pair is when copulation is completed. The male begins to flutter his wings and releases the female. The male then moves a few centimetres, flaps its wings and flies away. The wing flapping happens for both sexes after unplugging, this movement it done for about 29-63 seconds. Furthermore, this behaviour is longer in males. Also, at the end of copulation, they shut their wings and remain motionless for some minutes ranging from 8-47mins. This is known as "roosting" and it is typically shorter for males.

There is little known on when the females lay their eggs, if it is immediately after copulation or days after. What is known is that the females will lay their eggs singly on the tendrils of the *Passiflora* plant. The eggs are buff yellow and become mottled with brown before hatching. They measure about 1.15 x 1.04mm and have 18-21 vertical and 12-14 horizontal ridges (Fig. 4). The mature caterpillars are multicoloured and variable: usually beige to white with red to brown patches with fine black lines. They have long bristly black spines with a white base on the body and two short horns on the head (Fig. 5). The head capsule is brown-black with

some white and red. The pupa is mottled grey, vertically suspended, and somewhat S-formed but rounded.

BEHAVIOUR. Juvenile Behaviour: When they are in larval stage, they mainly consume the leaves of the *Passiflora* plant. On feeding the caterpillars would leave a piece of a leaf blade where it remains partially attached to the blade and withers. The caterpillars would then use this as a resting site (form of protection). *D. iulia* has five larval instar (stages) and at the fifth stage caterpillars change into pupae.

Antipredator Behaviour: *D. iulia* belongs to the "orange" Batesian mimicry mimic complex and species are highly unpalatable to birds and lizards this is because contain cyanogenic glycosides in various amounts (Brower, 1984). Generally they contain low cyanide amounts. The caterpillar feed exclusively on Passifloraceae which contain cyanide. Therefore, the cyanogenic glycosides are usually obtained by a combination of active storage from the foodplant and synthesis by the larva.

REFERENCES

Arthur, Ashley. 2015. *'Leaf Choice In Dryas Iulia (Nymphalidae: Heliconiinae): Cyanide Content And Toughness'*. http://usf.sobek.ufl.edu/content/SF/S0/00/14/87/00001/M39-00318.pdf. Accessed on 7th March 2015

Brower, Andrew V. Z., and Margarita Beltrán. 2015. *'Habits From Tree Of Life Web Project - Encyclopedia Of Life'*. Encyclopedia Of Life. http://eol.org/data_objects/10111205. Accessed on 9th March 2015

Brown, K S. 1981. 'The Biology Of Heliconius And Related Genera'. Annu. Rev. Entomol. 26 (1): 427-457. doi:10.1146/annurev.en.26.010181.002235. Accessed on 9th March 2015

Cambridgebutterfly.com,. 2015. *'Cambridge Butterfly Conservatory'*. http://www.cambridgebutterfly.com/index.php?option=com_content&view=article&id=171. Accessed on 24th March 2015

de la Rosa, Carlos L. 2014. *'Additional Observations Of Lachryphagous Butterflies And Bees'*. Frontiers In Ecology And The Environment 12 (4): 210-210. doi:10.1890/14.wb.006. Accessed on 10th March 2015

Host, Just. 2015. *'Butterflies Of Amazonia - Dryas Iulia'*. Learnaboutbutterflies.Com. http://www.learnaboutbutterflies.com/Amazon%20-%20Dryas%20iulia.htm. Accessed on 4th March 2015

Lester, Liza. 2015. *'Crocodile Tears Please Butterflies And Bees | Ecotone: News And Views On Ecological Science'*. Esa.Org. http://www.esa.org/esablog/research/crocodile-tears-please-butterflies-and-bees/. Accessed on 4th March 2015

Mega, Nicolás Oliveira, and Aldo Mellender de Araújo. 2009. *'Analysis Of The Mating Behavior And Some Possible Causes Of Male Copulatory Success In Dryas Iulia Alcionea (Lepidoptera, Nymphalidae, Heliconiinae)'*. J Ethol 28 (1): 123-132. doi:10.1007/s10164-009-0163-y. Accessed on 4th March 2015

Mega, Nicolás Oliveira, and Aldo Mellender de Araújo. 2008. *'Do Caterpillars Of Dryas Iulia Alcionea (Lepidoptera, Nymphalidae) Show Evidence Of Adaptive Behaviour To Avoid Predation By Ants?'*. Journal Of Natural History 42 (1-2): 129-137. doi:10.1080/00222930701827800. Accessed on 4th March 2015

Stiling, Peter D. 1986. *Butterflies And Other Insects Of The Eastern Caribbean*. London: Macmillan Caribbean.

Wikipedia.(2015). *Dryas iulia*. http://en.wikipedia.org/wiki/Dryas_iulia, downloaded 23rd March 2015.

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Fig. 2. *Dryas iulia* feeding on the tears of the caiman.

[http://www.learnaboutbutterflies.com/Amazon%20-%20Dryas%20iulia.htm, downloaded 24 March 2015]

Fig. 3. *Dryas iulia* feeding on the tears of the turtle.

[http://en.wikipedia.org/wiki/File:A_butterfly_feeding_on_the_tears_of_a_turtle_in_Ecuador.jpg, downloaded 24 March 2015]

Fig. 4. The egg of *Dryas iulia* on a tendril of *Passiflora* plant.

[http://photography.nationalgeographic.com/photography/photo-of-the-day/butterfly-egg-oeggerli/ downloaded 24 March 2015]

Fig. 5. *Dryas iulia* caterpillar.

[http://en.wikipedia.org/wiki/File:Dryas_julia_caterpillar.JPG, downloaded 31 March 2015]