

## *Phoebis sennae* (Cloudless Sulphur Butterfly)

Order: Lepidoptera (Butterflies and Moths)

Class: Insecta (Insects)

Phylum: Arthropoda (Arthropods)



**Fig. 1.** Cloudless sulphur butterfly, *Phoebis sennae*.

[<http://www.carolinanature.com/butterflies/cloudless sulphur1220072.jpg>, downloaded 29 March 2015]

**TRAITS.** The egg produced by this butterfly is a pitcher shaped white egg which eventually changes to a pale orange colour. The caterpillar is a yellow to green colour and has striped sides with rows of black dots on its back. The chrysalis is humped in the middle and has pointed ends, coloured yellow or green with green or pink stripes on it (Wikipedia, 2015). The male butterfly is a bright lemon yellow colour with a black border along the outer edges of the wings (Fig. 1). The female can either be a dull yellow colour (Fig. 2) or white (alba females), also with black borders along the outer edges of the wings but they can be distinguished from the males since the black borders also have yellow spots. When the wing is folded back the black border is concealed. This is a fairly medium sized butterfly with an average wing span of about 55-70mm (Wikipedia, 2015).

**DISTRIBUTION.** This butterfly can be found in the entire mainland of the United States and has a wide range of distribution which lies from South America to Southern Canada. It is most commonly found in the northern parts of Argentina to the southern parts of Texas and the Deep South. This butterfly can also be found in many islands of the Caribbean such as Trinidad where it is commonly found around the wet season. Thus it can be stated that this species of butterfly typically surrounds itself with warmer climates as it engages in migration from the areas of the United States which falls cold during the winter period, usually finding itself in the warmer areas such as Mexico and the Caribbean. During the fall season, the males tend to migrate early, moving in vast groups towards the southward areas clocking up to 20km in a day, whilst the females on the other hand tend to move more leisurely, reserving ample energy for themselves and for egg-laying purposes. For reasons not fully understood, while the majority of the cloudless sulphur butterflies find themselves south in warmer areas during the winter, it is seen that a sizeable amount also tend to fly in the northern direction which is mildly confusing because the colder areas represent certain death as they would be frozen once winter arrives.

**HABITAT AND ACTIVITY.** The cloudless sulphur butterfly is diurnal and can be found in a range of habitats such as disturbed areas for example parks, fields and yards, beaches, road edges, gardens, abandoned fields and watercourses. These butterflies prefer plants such as *Cassia* and *Senna* which are both members of the pea family, both wild and cultivated species.

**FOOD AND FEEDING.** The cloudless sulphur caterpillar eats legumes such as *Cassia* and *Senna* plants. Adult butterflies favour the nectar of milkweeds, pentas, azaleas, autumn sage, Mexican sage, dewdrops, hibiscus and wild morning glory. The colour of the cloudless sulphur caterpillar is based on the feeding pattern. For example the caterpillars that feed on green leaves such those of the *Cassia* and *Senna* plant turn green just like the leaves whilst those that eat flowers or coloured leaves will turn the same colour. The cloudless sulphur butterflies have also been observed feeding or gathering to feed on mud puddles. This is done to obtain minerals and nutrients that are contained in the soil.

**POPULATION ECOLOGY.** The cloudless sulphur butterfly remains in the larval stage on an average of 14-30 days. Adults can be seen fluttering around gardens and other natural habitats not in groups but as single individuals. Small groups of butterflies can be seen gathering together around mud pools. Other than this gathering they are not really known to socialize except when they come together to mate.

**REPRODUCTION.** The breeding season of the cloudless sulphur is dependent on the climate as they tend to breed during midsummer to fall in colder climates and year round in the warmer areas. Their species show strong sexual dimorphism. They reproduce via production of eggs which is the first stage of the life cycle (Fig. 4). After a single egg is laid on the tips of either a *Cassia* or *Senna* plant, it grows into the larva or caterpillar which is the second stage. Each egg produces one larva. The caterpillar feeds on the plant and grows in size, shedding its skin four or more times to accommodate its rapidly growing body. The third stage is known as the chrysalis. In this stage the caterpillars tissues are broken down and the adult butterfly's body is formed which is the final stage of the life cycle.

**BEHAVIOUR.** Adults usually feed mainly from nectar and mud, seeking out the minerals and salts from the water. The males patrol for females throughout the day, and upon finding suitable females they land beside them making contact with the female's wings by either flicking it with

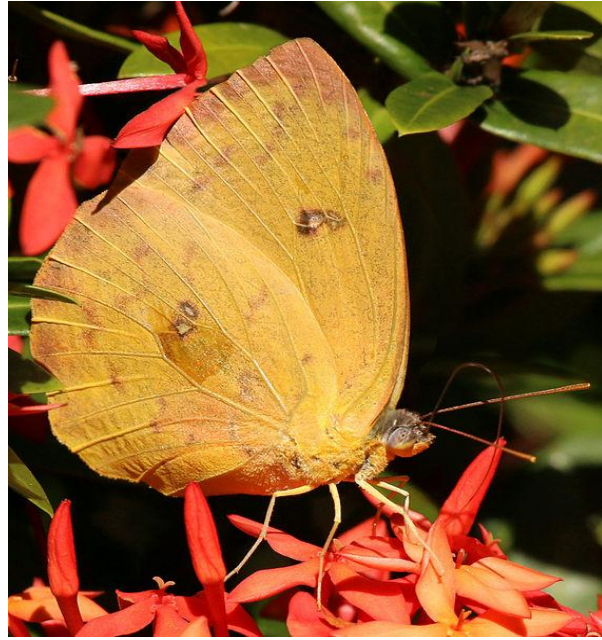
his legs or wings, then the female either flicks her wings and closes them or assumes the 'mating refusal' posture where she opens her wings and raises her abdomen. The flight pattern is fairly rapid and sometimes erratic and they usually stay within 1m of the ground. At nighttime or on dark cloudy days, the adult looks for just the right place to settle, roosting on many leaves as they are very choosy of where they settle. An adult preparing to roost makes an erratic flight around potential trees or shrubs, settling briefly, then flying around some more, and then typically selects a yellow or reddish leaf within other leaves on which to finally stop. This behaviour may help prevent attacks from predators that may be perching nearby. Although the adults are brightly colored when flying, they seem to suddenly disappear against similarly colored leaves in the shade which acts as a very effective camouflaging technique while resting. The site they choose may be low to the ground in the bushes with lots of shrubbery or high up in the leaves of trees. The larva has the ability to change its colour depending on the food that they consume and so acts as a means of camouflage.

#### REFERENCES

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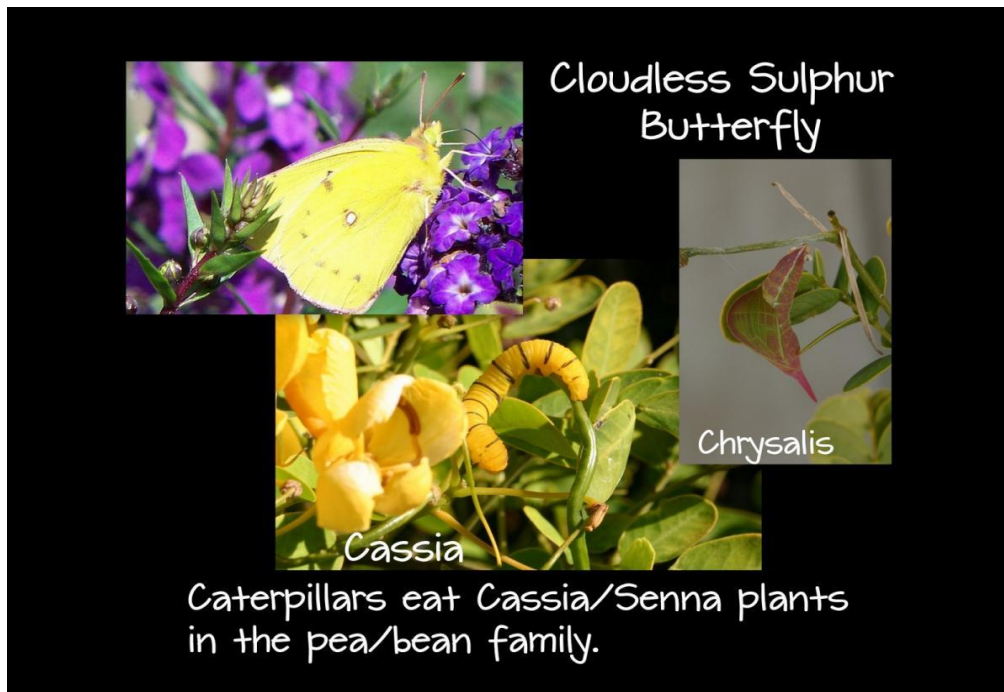
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Posted online: 2015



**Fig. 2.** Female *Phoebis sennae*.

[[http://en.wikipedia.org/wiki/Phoebis\\_sennae#/media/File:Cloudless\\_sulphur\\_\(Phoebis\\_sennae\\_sennae\)\\_female\\_underside.jpg](http://en.wikipedia.org/wiki/Phoebis_sennae#/media/File:Cloudless_sulphur_(Phoebis_sennae_sennae)_female_underside.jpg), downloaded 2 April 2015]



**Fig. 3.** Life cycle of *Phoebis sennae*.

[<http://kidsgrowingstrong.org/sites/default/files/Images/kids/Cloudless%20Sulphur.jpg>, downloaded 2 April 2015]

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