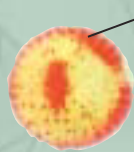




An Emerging Caterpillar

Butterflies usually lay large numbers of eggs. The number varies greatly; some females lay over 1,000, although only a few eggs may survive to become adults.

Eggs differ from one species to another in their color and in their surface texture, which can be smooth or beautifully sculptured. The two main types are a flattened oval shape, usually with a smooth surface, and a more upright shape, which often has a heavily ribbed surface. In most cases the female lays the eggs on a leaf or stem, but some species—particularly the grass-feeding butterflies—simply release their eggs in flight. Both methods are designed to place the caterpillar as near as possible to the plant on which it feeds. Below shows a caterpillar of a South American Owl butterfly hatching from its egg.



Pattern of ridges can be a useful aid to identification of eggs



Darker color shows that egg will soon be ready to hatch

RESTING

In many temperate butterflies, autumn-laid eggs usually go into a resting stage called diapause to pass the winter. This state is broken by low or fluctuating temperatures.

WARMING UP

Once winter diapause has broken, and the temperature has risen enough for the caterpillar to stand a chance of survival, the egg darkens in color as the tiny caterpillar gets ready to emerge.



Opening where caterpillar's jaws have cut through eggshell
Head of caterpillar starting to appear

CUTTING A CIRCLE

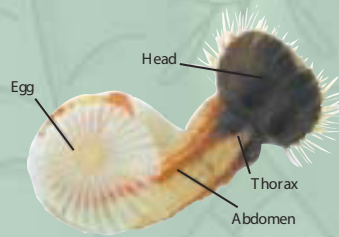
In order to hatch, the caterpillar must bite its way through the shell of the egg. This is not a hard, brittle shell like that of a hen's egg, but it still poses a tough task for the minute caterpillar: its jaws have to cut a circle big enough for the head to come out.



Ocelli
Antenna

EMERGING HEADFIRST

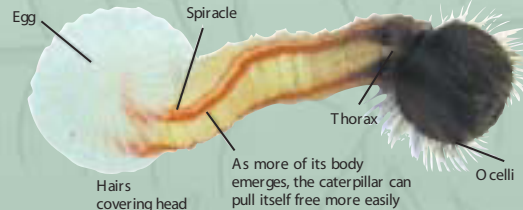
The caterpillar seems to have jaws and a head much larger than the rest of its body, but the enormous mouthparts are useful for biting an opening in the eggshell. Nevertheless, it can be quite difficult for the small caterpillar to haul itself out of the egg headfirst. The dark spots on each side of the head are simple eyes called ocelli. The caterpillar also gets information about its surroundings from its tiny antennae.



Egg
Head
Thorax
Abdomen

STRUGGLING TO ESCAPE

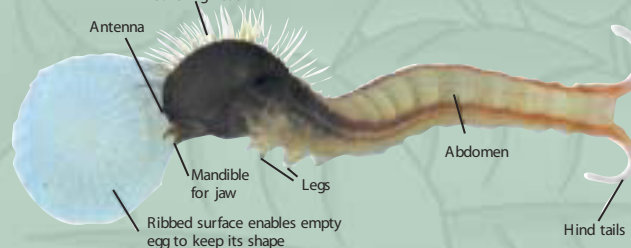
In order to get out, the caterpillar waves its head and body around. At this stage it is vulnerable to many enemies, and the quicker it can free itself, the better its chances of survival. As more of the body appears, the contrast between the size of the head and the rest of the caterpillar is even more obvious.



Egg
Spiracle
Thorax
Ocelli
As more of its body emerges, the caterpillar can pull itself free more easily
Hairs covering head

PULLING FREE

Only the caterpillar's hind claspers remain inside the egg. At this stage the caterpillar can exert much more pressure on the leaf with its front legs, and so can pull hard to release the rest of its body. The caterpillar's segments also help, since they allow it to twist around in all directions.



Antenna
Mandible for jaw
Legs
Abdomen
Hind tails
Ribbed surface enables empty egg to keep its shape

THE FIRST MEAL

No sooner is it out of the egg than the caterpillar starts to eat the eggshell. Many caterpillars will not develop properly unless they have eaten the shell, which contains nutrients that are essential for the insect's growth.

