

Last chance to see smew



Look for basking adders



**TINY & WILD ROSS PIPER**

# The greatest transformation

Inside the chrysalis, something incredible is happening...

Take a really good long look at a caterpillar, and now take a similarly good look at an adult moth or butterfly. These two beings are about as different as it's possible to be. One is a worm-like eating machine, while the other is a delicate creature of the air. The fact that these two beings are stages in the life of the same animal never fails to amaze me.

The change from plant-munching grub to nectar-sucking aeronaut is one example of the most remarkable, yet common phenomena in the natural world. All around you right now, in your garden, under your patio and in your window boxes, insect larvae that saw out the winter in a state of suspended animation are going through a mind-boggling transformation.

The pupa was once thought to be a resting stage in the life cycle of insects, but it is anything but. The pupa's calm exterior belies an incredible amount of activity. In a series of beautifully choreographed, hormone-controlled steps the body of larva is dismantled and the adult form assembled.

There's still a huge amount to learn about this remarkable phenomenon, but why do so many insects do it? It is a risky process, during which the insect is very vulnerable, but



## THE PUPATION PROCESS

### PRIVET HAWK MOTH

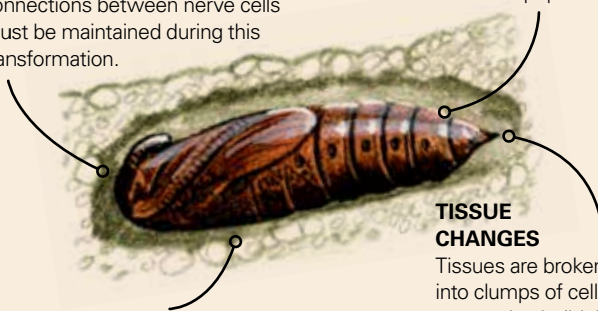
It was once thought that all of the larva's tissues were broken down during pupation to create a "soup", but new research has shown this is not the case...

### TREASURED MEMORIES

Memories formed by the larva are retained in the adult insect, so the connections between nerve cells must be maintained during this transformation.

### BUILDING BLOCKS

Small clusters of cells called imaginal discs give rise to the structures of the adult body and in some insects, these can be active before pupation.



### REMODELLING

Other tissues are retained and remodelled (for example the gut, trachea and some parts of the nervous system).

### TISSUE CHANGES

Tissues are broken down into clumps of cells that are used to build the adult (e.g. the muscles).

the genius of this transformation is that it allows a division of labour in the life of a single organism. The larva is an eating machine, its sole objective to grow, while the adult insect can concentrate on dispersal and mating. Not only that, but the larva and adult have completely different requirements, so they'll never be in competition.

Metamorphosis is a keystone in the success of the insects.

The four most speciose groups of insects – the beetles, hymenoptera, true flies and lepidoptera – all go through the incredible transformation from larva to adult.

## LOOKING FOR PUPAE

For the pupae (often called chrysalises) of butterflies, look in sheltered places around the foodplants. The glossy brown pupa of moths can often be found in the soil near foodplants, likewise for other insects. Under bark and in dead wood is a good place to look for the many types of beetle. Keeping pupa to see what hatches is fascinating, and you may get the macabre surprise of a parasitoid wasp or fly instead of the insect you were expecting.



**Dr Ross Piper** is an entomologist, zoologist and explorer. His book, *Animal Earth*, is a cutting-edge introduction to animal diversity. Find out more at [rosspiper.net](http://rosspiper.net)

## WHAT'S ON MARCH

### Mountain hare walk 17 February and 17 March

RSPB Dove Stone, Greater Manchester, leads the search for this Peak District rarity in its white winter fur. £8 (£10 non-members), book via **01457 819881** or email **miriam.biran@rspb.org.uk**.

### Photography workshop

**Saturday 23 March**  
Get expert advice from photographer Mike Malpass then put your new skills into practice out in the field at RSPB Leighton Moss, Lancashire. 11am–4pm, £48 (£60 non-members), book via **01524 701601**.

### Spotlight on cranes

**Sunday 3 March**  
Learn about this fantastic species at RSPB Lakenheath Fen, Suffolk, before embarking on a three-mile walk to try to see them for yourself. 2pm–6pm, £12 (£15 non-members), book via **lakenheath@rspb.org.uk** or **01842 863400**.



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