This is another of my infrequent reports concerning the life-cycle of one of our common species. This time it relates to the Large White, which is the most notorious and prominent of the “Cabbage Whites” (The other being the Small White). Both are well known to gardeners and vegetable growers, but it is the Large White which causes most of the damage to Brassica crops. Garden Nasturtium is also a favoured foodplant for this species. Most people have encountered the conspicuous eggs or larvae, so given this familiarity, I have tried to approach this report from a slightly different angle. This principally involves looking at a wild habitat involving a non-cultivated host plant as well as aiming to obtain new and detailed images that add to existing information. The majority of the early photos were taken in the wild, but several eggs and larvae were collected and taken home in order to continue to monitor and record their development to the pupal and adult stages.

Having failed to attract an egg-laying female to the larval host plants in my home garden, I was very pleased to find lots of Sea Kale (*Crambe maritima*) growing on a beach whilst holidaying on the Suffolk coast in early September 2011.

This wild Brassica was found growing in abundance along the coast at Dunwich Cliffs, occupying a band of shingle from the base of the sandy cliff to within a few metres of the high water mark. Several Large whites were seen to be investigating these plants. These individuals could either have been migrants or locally hatched. Soon one settled down to lay a batch of eggs. The eggs are usually laid on the underside of a leaf, but also on the upperside if it has a sheltered aspect. The average size of a batch is known to be 40-100 eggs, but those that I found ranged in size from a minimum of 23 to a maximum of 141. On some leaves were also the smaller, single eggs of the Small White. The Large White eggs are initially pale yellow, but gradually darken to orange and then to pale grey just before hatching. Vegetable growers and allotment holders should look away now.

Upon hatching the larvae consume their eggshells. In most instances all that remains is the circular imprint made by the base of the egg.
In the last photo above you can see the imprint left by the bases of the eggs and also a solitary Small White egg. Between 4th and 9th September 2011 I found over 1000 eggs in just a small area together with approximately 800 larvae in all stages of their development.

In this last photo you can clearly see the egg imprints.

For the first day the larvae feed on the surface of the leaf close to the hatching site, before moving as a group to a more secluded area of the plant.

Sometimes it may appear that one new hatchling has wandered away from the group. If it has a pale or orange-coloured head it is actually a Small White larva.

Freshly emerged Large White larvae have black heads. They feed and rest together and sometimes build a loose communal shelter within the plant using silken strands. It is not until much later in their development that they gradually disperse and become solitary.
The striking colouration of the late-instar stage is a warning to birds and other predators that they are distasteful, because of the mustard oils they have absorbed from the plant while feeding. This colouration appears around the 14th day of their development and the time between egg hatch and pupation took approximately 6 weeks.

When ready to pupate the larvae leave the plant and may travel some distance to seek out the undersides of solid structures such as building ledges, fences and branches, as well as tree trunks.
The colour pattern of the pupa varies according to such factors as light levels at the pupation site and the nature of the background.
Pupae range in colour between pale cream to pale green, through grey/green to grey, usually with speckling.

In the days before hatching the pupa darkens and the wing colours begin to show strongly through the pupal case. The head and abdominal areas then suddenly darken indicating that hatching is only a few hours away. A female emerging from the pupa is shown below.
If the temperature was right, most emergences took place between 2am and 8am. A male emerging from the pupa is shown below. This individual pupated in August 2013 and was one of several which were reared. The sequence shown below lasted only 90 seconds.
Not unexpectedly there were some losses along the way, mainly at the larval stage, but I was surprised to lose 5 pupae during one night due to predation by a rodent (most likely a mouse or shrew). They were just cleanly plucked from their sites, leaving no trace. Even more of a shock was finding a large spider guarding its latest meal.

I believe this to be *Drassodes lapidotus* (Stone Spider or Mouse Spider). Another possibility is *Drassodes cupreus* (Blackwall Spider). You can see the point where it has injected digestive enzymes into the pupa. These have the effect of liquifying the contents of the pupa, enabling the spider to subsequently suck them up.
The outcome is quite dramatic, but I would not have guessed it was the work of a spider unless I had seen it for myself. This turned out not to be an isolated incident, because I lost another pupa to a similar spider in September 2013.

Please note - NO SPIDERS WERE HARMED DURING THE PRODUCTION OF THIS REPORT!

However on a happier note:

My pupae were overwintered in an outbuilding located on the north side of the house which has good light, ventilation and humidity levels. It does not significantly insulate the pupae from low temperatures in winter nor does it warm up readily in the spring. In all cases, overwintered pupae of all species kept in this environment, have hatched after those in the wild. All adults were released at a suitable site as soon as weather conditions would allow.

2013 was a very good year for the Large White and many visited my garden. This enabled me to observe the species at my leisure, particularly in July and August when they were being attracted to my Buddleia, Nasturtium and fresh growth Garlic Mustard.

Many batches of eggs were found, particularly on the Nasturtium. These batches varied in size and most, but not all were placed on the underside of a leaf.
However some of the placement of eggs was erratic, for reasons unknown.

Other notable observations included a female egg laying on a Garlic Mustard plant that was in permanent deep shade.

Also a female which chose to lay a small batch on a withered Garlic Mustard leaf (facing the sun), despite having other healthy leaves within reach.

I have reared a small batch of larvae, which pupated around 24th August, but am not expecting any adults to emerge until May 2014.
Large White eggs freshly laid on a withered leaf  
**Caterham, Surrey 8-Aug-2013**  
Photo © Vince Massimo

Reference Images

Reference images of the adults are shown below.

![Large White male](image1)  
**Large White male**  
**Caterham, Surrey 22-Sept-2012**  
Photo © Vince Massimo

![Large White female](image2)  
**Large White female**  
**Crawley, Sussex 17-Sept-2008**  
Photo © Vince Massimo

![Large White female](image3)  
**Large White female**  
**Chaldon, Surrey 6-June-2010**  
Photo © Vince Massimo