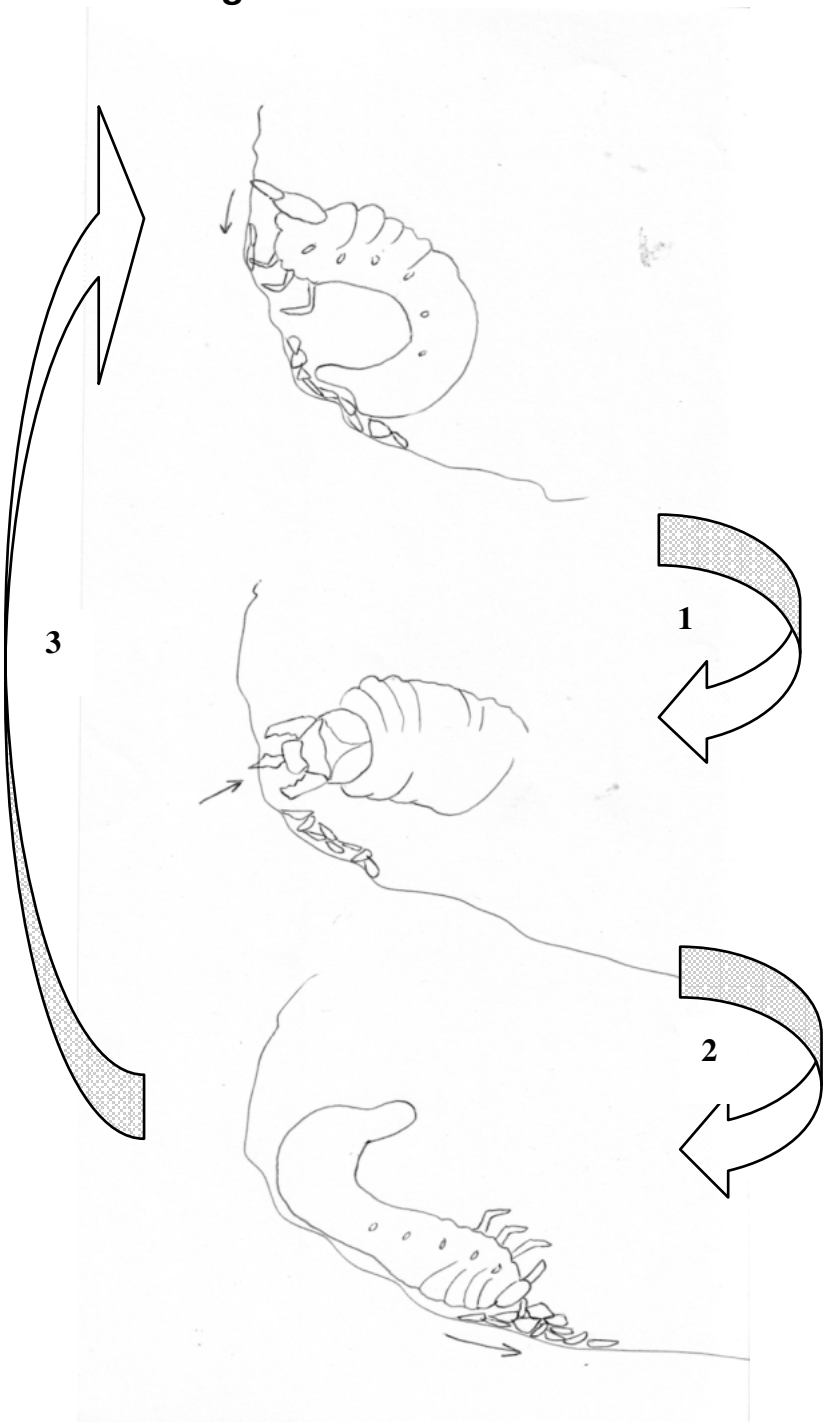
How stag beetle larvae eat



The drawings on the left show the way stag larvae eat.

Usually stag beetle larvae start to scrape the surface of rather soft wood that is infected with white rot (see top larva). They do this by moving their mandibles down and so scraping out small splinters of wood. The holes stag larvae make in wood, are often totally stuffed with these splinters.

The next step (1) is that the larva will search this scattered wood for eatable splinters. This is done by just picking splinters from the scratched surface (see middle larva). Or by searching the splinters around itself and eating the suitable ones. A larva in bad substrate will constantly be busy with scraping and searching, but will eat little. Larvae in good substrate will scrape little and eat much. They therefore have little loss of energy and grow well.

2. After some time (varying from some minutes to sometimes an hour or so) the larva shuffles away the splinters with its head to the other side of its hole. This way the larva clears up the part it searches for eatable splinters. Then it turns around and starts again, next step (3).

This is a general description of the way the larvae eat. Of course their position often varies. As well as the time they spend in a certain position.

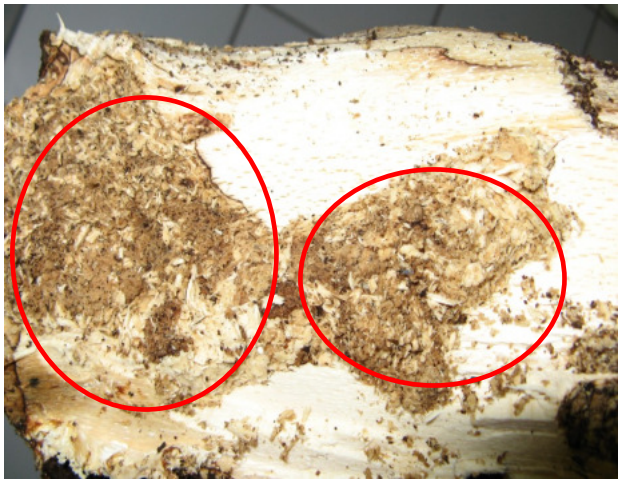
On the left, you can see a third instar, L3, stag larva in action. It has been scratching the surface to which the red arrow points in the picture on top. The larva follows a ‘ vein’ of white rot, surrounded by the darker mould, seen in the picture. It is now busy pulling the splinters backwards. You can see these splinters lying underneath the larva.

In the picture on the left the larva is searching the splinters for suitable ones to eat. It is hard to tell how the larvae pick the splinters they eat. Visually, these splinters look very similar. When you look close at a searching larva, however, you can see that it examines the splinters carefully with its mouthparts. It is important to realize that these stag larvae do not eat all the splintered wood, but select their food from it.

Here the larva bites in the wood. Once they’ve selected a splinter, they will swallow it intact. These splinters always have approximately the same size and measure about 3 or 4 mm in length and are 1 or 2 mm broad.

Here is a special occasion when the larva produces a dropping, looking like a sort of compressed pallet or pillow, Notice that the larva is now lying in the opposite direction.

A dropping is often picked up with the mandibles and front legs and pushed to the other side from where the larva was feeding. It moves the unwanted splinters the same way. By continually doing so, it moves forward through the dead wood and creates tunnels in it, stuffed with splinters and droppings (see bottom larva, first page).



Here, the red circles show the tunnels, stuffed with splinters. As the larvae pull the splinters with some force, these tunnels can be densely packed.

In the picture on the left, you can see a young L3 larva. It has already stretched to full length, but is still quite thin You can tell by the little amount of white tissue, specially when you compare it with the next picture; a mature L3 larva.

The larva in this picture has thick fat folds of tissue in the thorax, right after the head. The rest of the body also contains more white-yellowish tissue, which is mostly fat. This noticeable accumulation of fat tissue tells us how well the larva is growing. The rest of the larva is mostly its rather bulky gut, a bit like a large fermenting vat. The darker colour at the end is the accumulation of the faeces.

The question is: do stag beetle larvae re-ingest their own droppings or not? Rabbits do that in order to digest as much goodness as possible out of their food.
It would be interesting to find out more about this. Please give me your feedback.

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