Science UK: The science of worm watching – text

What can we learn from worms? Find out by reading this article about how scientists are using worms in their research. If you want to know more about the research check out Worm Watch Lab at http://www.wormwatchlab.org which explains the experiments in more detail.

'People sometimes think scientists sit around all day, and think about big questions and don't get their hands dirty,' says Dr William Schafer, Group Leader at the Medical Research Council. So Worm Watch Lab allows anybody who is interested in science to get their 'hands dirty' through the simple act of watching and writing about worm behaviours.

Worm Watch Lab, a collaboration between Zooniverse and the MRC, is studying worm egg laying in a project exploring brain activity and how genes affect behaviour. 'We've studied these Nematode worms,' says Dr William Schafer, 'because they have a very simple nervous system but at a biochemical level their neurons work very much the same as human neurons.'

The team became interested in egg laying by worms because egg laying is one of the main behaviours controlled by serotonin, a brain chemical that makes you feel relaxed and happy. This, of course, is interesting for doctors because of how it affects mood in humans, says Dr Schafer. The worms lay eggs about ten times an hour, and while computer vision is good at recording movement, it is more difficult to register the worms laying eggs by their side.

The films of the worms' egg laying revealed a pattern, which the team could describe in terms of equations. 'The interesting thing,' says Dr Schafer, 'is that there were aspects of this timing that were controlled by serotonin.' Over many years the team involved in observing and analysing worm behaviour had developed more sophisticated techniques. They developed methods for using computer vision to measure things about behaviour that were interesting for different neurological pathways – such as 'how curvy their locomotion was or how they moved their head'.

But to understand the relationship between genes, the nervous system and egg-laying behaviour, they needed more eyes for the huge amount of visual information they had collected – 10,000 movies means '10,000 15-minute movies,' says Schafer, 'and each clip is only seconds which makes over 300,000 clips.' So Worm Watch Lab was born. Because egg laying is controlled by a totally different part of the nervous system, 'if we can find a connection between different behaviours produced by different sets of muscles, then that will be a good way to try to answer these questions about mood, behavioural and neural states, which are really interesting and really difficult to understand.'

If you're interested in science check out the British Council's science magazine called *Cubed* at http://www.britishcouncil.org/cubed.