Pink blob and Dog Vomit: Part Two

So, the most studied slime mold in the world is the Physarum Polycephalum slime mold. A legless, brainless, single celled organism that oozes and transforms itself but can also avoid stimuli, avoid chemicals, change behaviour with climatic conditions and pass on knowledge!

They form strange and sophisticated shapes – some resemble honeycomb lattices, others blackberries. And then there's the slime mold known as "dog vomit," because it looks just like the stuff with yellow bile like colours. Some remain microscopic, and others grow rogue, forming bulbous masses, as long as 3-4 metres across.

For creatures without feet, they can travel incredible distances. Stephenson said one of his students identified slime molds in New Zealand that are genetically identical to groups found in the United States. How they got there is unknown. So so cool…

And although the slime mold's has no neurons throughout its entire gelatinous body, they seem to be able to solve relatively complex problems, especially if they'll be rewarded and to be capable of memory!

Slime molds are fungi in the class Myxomycetes. These are cosmopolitan organisms that feed on bacteria, protozoa, and other tiny organisms. As is the case with other fungi, slime molds reproduce by spores. Once the spores germinate, they go through several developmental stages which eventually result in a feeding stage called a …..plasmodium……A plasmodium – what a fab word! It conjures up all sorts doesn't it?!

It is actually 'a multinucleate mass of protoplasm which results from the fusion of amoeba-like cells.' So when sufficient water is available, slime molds creep or flow over many types of surfaces. They creep at a fairly fast pace and some species can actually move several feet in 24 hours.

Most slime molds spend their days alone and unseen (microscopic). However, when food gets scarce, they slowly move towards one another to create a new structure to produce spores that will be taken to a new place by the wind.

Slime mold can show some really interesting behaviours. For instance, having fed on a nice pile of oats, the slime mold goes off to explore new territories in different directions simultaneously. When it meets itself, it knows it's already

there, it recognizes it's there, and instead retreats back and grows in other directions. How? What? How can what was essentially just a bag of cellular slime somehow map its territory, know itself, and move with seeming intention.

It has been known to map and replicate the suburban railway network of Tokyo in Japan when piles of oats were placed at strategic points on a map otherwise known as actual stations!

It is a biological computer. As such, it has been mathematically modelled, algorithmically analysed. It's been sonified, replicated, simulated. World over, teams of researchers are decoding its biological principles to understand its computational rules and applying that learning to the fields of electronics, programming and robotics.

So the question is, how does this thing work? It doesn't have a central nervous system. It doesn't have a brain, yet it can perform behaviours that we associate with brain function. It can learn, it can remember, it can solve problems, it can make decisions. So where does that intelligence lie? So inside the slime mold, there is a rhythmic pulsing flow, a vein-like structure carrying cellular material, nutrients and chemical information through the cell, streaming first in one direction and then back in another. And it is this continuous, synchronous oscillation within the cell that allows it to form quite a complex understanding of its environment, but without any large-scale control centre. This is where its intelligence lies.

So it's not just academic researchers in universities that are interested in this organism. A few years ago, the Slime Mould Collective was set up. It's an online, open, democratic network for slime mold researchers and enthusiasts to share knowledge and experimentation across disciplinary divides and across academic divides.

You can also get slime molds that are kept as pets – I'm thinking of giving some as presents to friends of mine with children! So much fun!

But back to the ecology of slime molds – we know that they live in the soil as cells and feed on bacteria, fungi and algae but what eats them? Beetles and slugs. Since they are not toxic anything can eat them. Although they may be found all over the world even in the Artic they don't really like cold climates. Slime molds are incredibly important in the recycling of nutrients which is very important to how the earth functions

When I decided to do a blog on slime molds I really didn't expect to find so many myself in such a short space of time. The following piccies are from the last two weeks! They must have been hungry and the weather conditions just right – so, so cool 😊

Found in Dingwall

Found in the pine woods in Nethy Bridge

Found in Grantown-on-Spey

Found in a neighbours garden

Oh and I nearly forgot – they can survive space too – currently 3 years so far!

References:

YouTube: When micro becomes macro

How Science works

The Connecticut Agricultural experiment station

Acorn Naturalists: Mallory Lindsay

PBS Newshour

Appalachian voices

Heather Barnett Ted Talk

Photos in Blog Part 1 were free from Dreamstime.com