

Draft of piece for DG

April 4th, 2016.

As yet unposted (I am my own worst Editor 😊)

Sex & Drug dealing in a forest near YOU!

I didn't appreciate it before watching a great programme on Netherlands TV recently, but the Fungi we all see in the woodlands and forests are just the tip of a very large iceberg.

It also happens that the bits you see on the surface are the "Rude Bits", the Sex organs, of this much larger underground ~~ergasm~~ Organism.



The programme was "De Kennis van Nu", which translates as "The Knowledge of now", and it was broadcast on the NPO, a National public broadcasting service on Thursday last week.

There is a group of Fungi called Mycorrhiza that have some very interesting relationships with the roots of trees.....Hey, this is Holland OK? We are allowed to talk about sex, so stop sniggering.

According to Biologist, Marcel van der Heijden, one gram of forest soil can contain between 10 and 100 metres of this thread, invisible to the naked eye, but easily seen under the microscope.

In a single bucketful of soil dug from the Forest floor it is possible to find around 1500 Kilometres of these threads. That's quite a lot!

A forest is a battlefield, where trees compete to access light and nutrients, but instead of killing each other, (The Human way) trees share their resources and trade on a massive scale, delivering Carbon in exchange for Nitrogen and Phosphorous.

This was pretty much a known part of Botany, but then along came Tamir Klein and 2 colleagues to conduct [a detailed study](#) of the movements of Carbon dioxide between trees and each other, and between trees and underground Fungi. This study establishes a Carbon exchange mechanism very much larger and more complex than originally thought. One finding was that in a single hectare of forest around 280kg of carbon is exchanged between the trees themselves, representing 40% of the carbon take up, the other 60% coming from the air.

This exchange mechanism is a puzzle but the study's authors believe that carbon isn't a critical raw material for the trees in the same way that Nitrogen and Phosphorous are, and this balancing act helps ensure a continuous exchange of those minerals with the underground fungi, helping build a more resilient forest.

In his book *The Hidden Life of Trees* the German forester Peter Wohlleben paints a romantic view of the forest, describing how trees help each other to survive and form a cohesive society, which of course is just what we Tree Huggers want to hear....so his book became a best seller. This doesn't make Peter a bad person, it's just that more recent research has had a hand in painting a slightly different picture.

This wonderfully cooperative life in the forest isn't all just peace and light.

According to Professor Kuyper at Wageningen University, Netherlands, Spruce and Fir trees attract this little bugger (Right) with the purple socks on, and it is a murderer plain and simple. Insects known as Springtails love to eat fungi, but not this one, it loves to eat Springtails, first paralysing them, then killing them, to be consumed for the Nitrogen they possess.



This "Tweekleurige Fopzwam" or "Purple Socked murdering bastard" is a Mycorrhiza- Fungi, and live in a symbiotic relationship with trees, but Toby Kiers, Professor of Evolutionary Biology, says, "We now know that more than two thirds of all plants that grow, benefit from the cooperation with such a fungus on land. It is an underground economic market that has existed for about 450 million years".

This Mycorrhiza cannot make sugar on its own, it must get it from tree roots, and it gets itself really cosy with them, it becomes an extension of the very root system in fact. The clever (but dastardly) part is that the Mycorrhiza can, in some way, cut off the normal channel of nutrient supply to the tree, after all why would a tree getting its fix of chemicals through its own root system need to give its sugars away? But with the Mycorrhiza installed, and the supply cut off, the tree has no choice, "hand over the sugars or the tree gets the chop"

Typical Drug Dealer tactics, first dependency, then Hand over the Loot. Some Mycorrhiza are believed to be able to hoard nutrients, taking all of the Phosphorous for example, and stashing it where the tree roots cannot reach it, a perfect ruse to up the price, get more sugars and spread its dirty business to the next tree on the block.

So I guess that life in the forest really is a bit like life in the city

Tony Broomfield