Agar

Growing fungi on agar is considered stage one among cultivation techniques. This section will give an overview of the method and when and why to rely on it.

Agar or agar-agar is a jelly-like substance gained by mixing the linear polysaccharide agarose and a heterogeneous mixture of smaller molecules called agaropectin. This substance is formed in the cell walls of certain algae species. It is extracted by boiling.

In microbiology, an agar plate or petri dish is used as a nutrient medium to grow cultures of microorganisms such as bacteria or fungi.

The agar powder is mixed with water and sometimes supplemented with nutrients such as yeast, malt extract, dextrose or others. It is then stirred and heated up to 85 °C – its melting point. If the agar is poured on glass Petri dishes, it can be cooled to 40 – 32 °C, where it starts solidifying again. The glass Petri dishes are then sterilised at 0.8 PSI for 45 minutes and left to cool in the unopened pressure cooker overnight. They can then be sealed using parafilm and allowed to cool out and solidify. Sealed agar plates are wrapped in zip lock bags and stored upside down at 4 °C for several weeks. In order to test sterility, a dish can be left at room temperatures for a day or two. If it stays clear of any bacterial or mould growth, the batch can be considered sterile for use.

As much as many amateur mycologists dislike working with agar, as inevitable it is. The uses for agar are manifold. Most importantly, it is a first cultivation technique for liquid cultures or spores acquired from commercial outlets. Further, tissue clones or spores from specimens gathered in the wild or from other fresh cultivars are plated out on agar. The plates allow for easy inspection for contamination, as the mycelium is forced to grow in a reasonably two-dimensional, flat structure. This flat growth allows for easy identification for promising strains for isolation from less promising ones or from contaminated areas to purify a culture over three generations. Petri dishes are easy to manage, handle and store. It also allows for easy transfer to further generations of agar, liquid culture, grain spawn or even fruiting media such as manure or sawdust. Another drawback of agar, next to its steep learning curve, is senescence. Just like us humans, fungi age, too. Senescence is why three generations of growing out a particular culture on agar plates is considered the right balance of isolation and purification and senescence of

the organism. The mycelium will lose vigour over time – only sexual reproduction will ensure its viability for long periods. The organism has to be coerced into fruiting, spore prints taken and genetically new tissue grown.

After taking some time to get used to it, this technique proves immensely valuable for many aspects of mycology. One nice experiment I did was colouring the agar media using food colouring. I most like my black petri dish. They offer great contrast for photography. Before switching to food colouring, I experimented with charcoal. However, I never got that to work. The activated charcoal I got from a beauty store was too coarse and never dissolved.