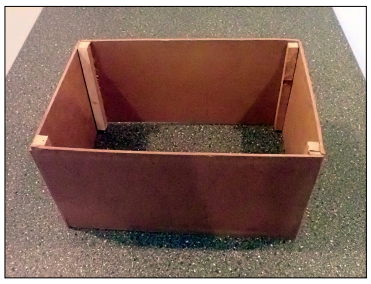
PENNY'S ADVICE ON DRYING FUNGI, DRIERS, WORKING WITH DRIED MATERIAL

It is easy to dry fungi specimens at home – either for scientific or culinary purposes – without acquiring any expensive equipment. There are suitable driers available online which work well but these are not essential, are quite expensive, and take up a fair amount of space. If you plan to make use of a drier for fruit / veg as well then it could well be worth investing in one, but if you merely want to dry the odd fungi specimens and maybe the occasional bumper crop of ceps then my advice is to do it the 'Heath Robinson' way – as I've done successfully for years. The two key essentials are very gentle heat and good air circulation**.**

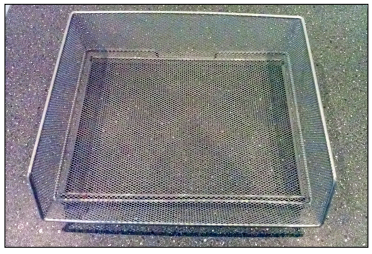
To make your own drier

Heat source: A warm well-lagged airing cupboard is ideal and should provide enough continuous gentle heat. If not available then a low powered light bulb is a good alternative. (My set-up utilises both: a light bulb inside my airing cupboard as shown here.)

Light bulb method: To cover your light bulb you need **a frame of sorts** on which to place your trays for drying. Imagine a rectangular cube but missing the top and bottom, ie just the four sides, which will sit over the light bulb. Mine is 12 inches x 8 and stands 6 inches tall, made of hardboard. This leaves enough headroom above the bulb for the heat to circulate fairly evenly.



Trays / racks: I use a wire mesh letter tray which allows good air circulation and fits neatly on top of the hardboard rectangle. If I need more space I have an old cake cooling rack which I've covered in very fine wire mesh which sits on top supported by the sides of the letter tray.



Plastic tea strainers: To keep collections of small specimens separate I bought some cheap tea strainers then removed the handles – perfect! (Other containers, eg plastic, would restrict air flow so are not recommended.)

My set-up in-situ:

Recommended temperature for drying fungi.

The British Mycological Society driers - for use by attendees at their weeklong autumn and upland field sessions - are set to a **max 40 degrees C**. Many driers on the market use a higher temperature than this, but if you buy one do not be tempted to turn up the heat any higher than 40 C, especially if the material is to be preserved for a fungarium such as RBG Kew or for DNA sequencing. Material which is dried too fast and at too high a temperature becomes brittle (is virtually cooked) and is of little use for later microscopic examination, furthermore when used in this state for DNA the sequencing is more than likely to fail.

My personal experience is that drying for longer at a somewhat cooler temperature than 40 C – ie in an airing cupboard either with or without an additional bulb – works really well. Samples become completely dehydrated but remain pliable - not brittle – consequently they are far easier to work with later. Moreover I have very few failures when sending samples for sequencing and have often been complimented on their condition.

How long will fungi last once dried? If dried properly, pretty well indefinitely (many years) - for microscopic examination and culinary use. For sequencing it appears that the older the material the more chance of it failing, but anything up to 10 years or so seems to be no problem and some much older samples than this have worked fine.

How long will samples take to dry? This depends on size, thickness and number of collections. Smaller samples obviously take less time and for, say, *Mycena / Galerina* types probably no more than 24 hours is needed; for larger species it makes sense to split them in half / even quarters lengthways to speed up the process and give them several days at least, maybe turning them over midway. I have often left collections for weeks before packeting them up with no adverse effects. With my combined bulb / airing-cupboard method I start them off with the bulb turned on, then once they're pretty well dry I turn the bulb off and leave them in situ to finish off. At this gentle heat they come to no harm if left until you're ready to process them, but with commercial driers and higher temperatures this would not be the case.

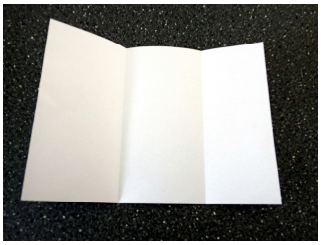
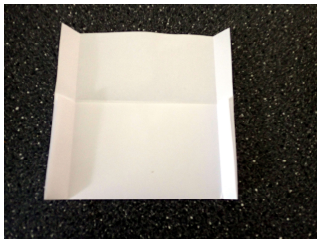
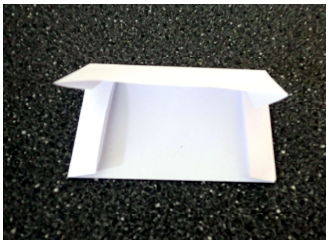
Tips on preparing specimens for drying

- Make sure you've made all the notes / microscopical observations required before you set your specimens to dry.
- If you have several specimens, retain one to take a spore print on a microscope slide, then add it to the rest of the drying collection later. To preserve your print (having first used it for measurement / photography if required) cover with another slide, fix it down either end with sticky tape, label it to keep with the collection. (Spore prints can be used for sequencing as well as dried material.)
- Carefully clean up specimens before drying, removing debris as best you can without disturbing the surface or the stem base (not always easy). Discard older specimens if they're already starting to deteriorate or are obviously buggy.
- With tiny Ascos it's often best to leave them on the substrate otherwise they can disappear altogether!
- ALWAYS include a label on the drier with each collection with name if known, site, grid ref, date, collector. You may think you'll remember but you might not, also what may be recognisable when fresh may well change radically and become unrecognisable when dried.
- Use tea strainers to keep collections of small species together and avoid mixed collections. Make sure larger species / collections of species are well separated from each other. It's all too easy to inadvertently knock the tray and dislodge / cause collections to become mixed.

How to store your collections once dried

Here are two recommended ways:
Method 1: The easiest way is to buy a selection of different sized sealable airtight plastic bags – very cheap online. For collections of even small things, it's worth getting bags which are just tall enough to include a microscope slide with your spore print. NB Samples must be completely dry otherwise they'll go mouldy when sealed in! Sticky labels are useful for details, though a piece of paper inside the bag will suffice.
Method 2: The conventional way is to fold a sheet of A4 paper (or smaller) to form an envelope with a simple pocket within. (Alternatively you could use an envelope but I find the flap is not big enough unless stuck down, then it's a nuisance to reseal if you want to take a sample out etc.)

- Make two folds in your A4 sheet, dividing it into three roughly equal sections.
- Fold up the bottom section, leaving the top section open, then fold in both sides to form a small border either side.
- Keeping the side borders closed, fold over the top section, giving you a pocket in which to safely place samples. Fix down with a paper clip if required for extra safety.
- This system has the advantage that you can write all details of the contents on the outside – no need for labels - also insert any notes etc. NB Take care not to allow any moisture anywhere near during storage!

Tips on using dried material for microscopic study

- To examine a gill, carefully remove a whole gill from the cap using forceps or a razor blade, lay it flat on a slide and soak in water, ammonia or congo red for several minutes to allow it to fully rehydrate.
- Do not attempt to make a gill edge section before the gill has rehydrated! If you do, either your brittle cut edge will shoot off out of sight never to be seen again, or when you attempt to squash your prep for examination the cells will fragment and disintegrateinto a meaningless mess!
- Slide your rehydrated gill out of the liquid with a pin, carefully slice your thin slivers to examine for cheilo / pleurocystidia etc, add a drop of ammonia to aid cell separation, then your coverslip, BUT go very cautiously with tapping out your prep, checking as you go. If the cells still disintegrate too much you may have to take another gill and repeat the process, leaving it to soak for longer. Different genera will react in different ways. Trial and error with patience is the best way forward.