

The Genus *Lactarius*

Why *Lactarius*

When I first took a serious interest in mycology I asked several mycologists what their approach would be if they were starting again. They all said three things:

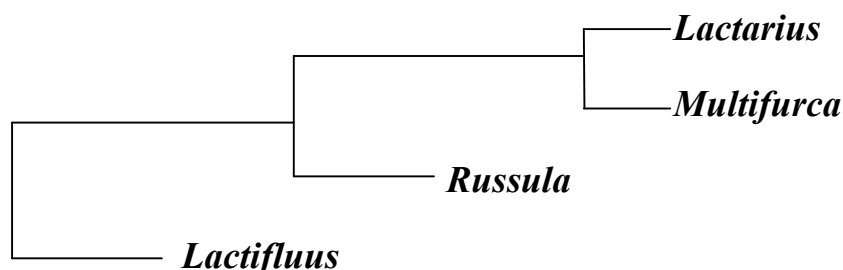
- learn the basics, like the parts of the fungus, how to make a spore print and so on. Go on a course.
- go on forays and listen and learn from the other participants.
- get to know one genus really well so that you have something to contribute.

So, how to pick a genus? I did not own a microscope, I needed a genus with not too many species, most of which could be identified by field characters and one with a few edible species and no poisonous ones. It would also be good to have a modern monograph to work from.

Lactarius fulfilled all but the last of these requirements. There are about 450 species of *Lactarius* known worldwide and there were about 60 known at the time in Western Europe. Almost 90% could be identified from their macro characters.

History

The genus was first described by Persoon in 1797. It was one of two genera in the family Russulaceae, the other being *Russula*. The advent of molecular phylogenetics led Buyck et al to the split *Lactarius* in to three genera:



More recent work by Teresa Lebel in Australia and by other researchers has shown that the gasteroid and secotoid genera *Arcangeliella* and

Zelleromyces should also be in *Lactarius* but the transfer has not been formalised yet.

Description of the Genus

Two main characters define the Russulaceae:

- Brittle flesh and gills caused by having round to ovoid cells commonly in their flesh. Try breaking the stem of a *Lactarius* and it snaps like a piece of chalk.
- The spores have amyloid ornamentation. When you place the spores in Melzers reagent a pattern of spines, warts and or ridges turns blue black on the spore. Amyloid = blue black in Melzers.

What separates *Russula* from *Lactarius* is that the latter yield latex (milk) when cut.

The distinctions between *Lactarius*, *Lactifluus* and *Multifurca* are far from clear, so most field mycologists still work with a wide concept that includes all three. All the field guides also work this way with *Lactarius* sensu lato (in the broad sense) as the generic name.

Characters used to define *Lactarius* species

To identify a *Lactarius* to species there are some characters that need to be recorded in the field and some that you can record when you get home. These are the ones I use:

Host: when you find your specimen, look up and make a note of what tree species it is growing with. *Lactarius* are fussy about what they grow with. In Europe and North America that information is readily available, less so in Queensland. You must at least be able to work out if it is a native or exotic tree and if exotic whether it is a broadleaf or a conifer. This must be done in the field.

Milk (Latex) colour: Get out your penknife and make a cut diagonally across the gills. Record the colour of the milk when it appears and then again 5 minutes later. A good way to do this is to carry small strips of kitchen paper and put a little of the milk on it and keep it in the same bag as the specimen. If you suspect you have a *Lactarius* but the specimen is not very fresh and does not yield milk from the gills, slice about 10 mm

off the edge of the cap and examine the flesh with your hand lense. Milk can be white, watery with white clouds (hyaline), orange, yellow, pink, or brown and can turn pink, grey, brown or green. Milk colour must be determined in the field.

Milk taste: get one drop of milk on your index finger, transfer it to the tip of your tongue and wait. You need to record if it is hot/peppery or mild. All of us taste somewhat differently, some field mycologists record bitter and slowly hot, but most descriptions boil down to being either hot or mild. Milk taste must be determined in the field.

Cap colour: record the colour of the cap and whether it is uniform or zoned. This is best recorded when you get home and can compare the colour with a printed colour chart. Always record the name of the colour and what chart you got the name from.

Cap size: measure the cap diameter. This is best done at home.

Gill attachment: check whether the gills are decurrent, subdecurrent or adnate. Best done at home, if you have trouble deciding, cut your fungus vertically in two halves and look again.

Gill types: some species have full gills only, that is gills that run all the way from the edge of the cap to the stipe, others also have short gills that do not reach the stipe, called lamellulae. Some have gills that fork. This is best done at home.

Gill edge colour: at least one species has an edge which is darker than the gill itself.

Stipe size: most *Lactarius* have regularly shaped cylindrical stipes. Measure height and diameter.

Stipe colour: record the colour of the stipe, if the stipe has small pits on it (scrobicules) that are a darker colour, record this too.

More advanced records

Some students of *Lactarius* also record some chemical tests and and microscopic details, here are the main ones.

Chemical tests:

- rub a ferric alum crystal on the stipe and observe the colour change, it will be: nil, salmon or green.
- put one drop of milk on a glass slide and mix with one drop of 5% KOH. Note if it stays white or turns yellow. Only work with *Lactarius* having white milk.

Microscopic characters:

Take spores from a spore print and put them on a glass slide, add a drop of Melzers reagent and a cover slip.

- measure the spore length and width of 10 spores. Use an excel calculator to get averages and standard deviations.
- note the type or ornamentation, is it spines (echinulate), warts, ridges (reticulate) or some mixture of these.

More advanced still requires examining a vertical section of the cap to determine the type of pileipellis. Use congo red to stain your section.

The size and shape of the gill cystidia can also be important.

Lactarius in Australia:

There are probably about 30 species of *Lactarius* in Australia.

Seven species are endemic to Australia and have published descriptions (Queensland species in orange):

- *L. clarkeae*
- *L. eucalypti*
- *L. genevieveae*
- *L. leonardii*
- *L. mea*
- *L. subclarkeae*
- *L. wirrabara*

Two species are shared with New Zealand:

- *L. aurantioruber*
- *L. sepiaceus*

Two species found in native forests have European names but are believed to be distinct Australian species here given tag names:

- *L. 'austropiperatus'*
- *L. 'lactiglaucus'*

Four species are known to have been introduced to Australia with their European host trees:

- *L. deliciosus*
- *L. pubescens*
- *L. torminosus*
- *L. turpis*

A further 9 collections have been made and described but have not been published, they currently have tag names:

- *L. "cremeoluteus"*
- *L. "corvinidus"*
- *L. "lactifuscus"*
- *L. "aff lignyotis"*
- *L. "pallidoaurantiarcus"*
- *L. "petrucalvus"*
- *L. "queenslandicus"*
- *L. "tasmanicus"*
- *L. "sp PL267087"*

Remember:

Make good records and submit them to the herbarium with your specimen. A *Lactarius* that does not have an accompanying note to say what it was growing under and no milk colour or taste record is worse than useless.

Patrick Leonard

3 October 2017