Two Green Cups

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Figure 1. Chlorociboia aeruginosa, above, and C. aeruginascens, below. Same magnification. Note that C. aeruginascens is larger and has a blue-green hymenium, while C. aeruginosa is smaller and has a light coloured hymenium. Young specimens may not show this difference so clearly, as both species tend to be azure all over in youth. I have not seen cups quite this white before, but light green to yellow is common. Note also that the wood in the lower picture does not show staining. Such chance pictures have probably caused some authors to state that one species does not colour wood. In fact, both species stain wood a cyan colour. (Photo: R. Smith, Foray NL)

This communication is an expanded version of the same material published in the FORAY NEWFOUNDLAND & LABRADOR 2008 Annual Foray Report. The full report is downloadable from the FNL website <www.nlmushrooms.ca>.

THE WORLD OF MUSHROOMS has many lookalikes, mushrooms that resemble each other macromorphologically (by their gross—macroscopic—looks), even though they are different species. This should not be totally surprising, if you consider that we see only the fruiting bodies of mushrooms, while for plants and animals we see most, if not all of the organism. Even so, I suspect that fruiting bodies of most similar species have subtle but real macroscopic differences, differences that might be more obvious if we only knew the mushrooms a bit better. Many are so uncommon, that we just lack enough familiarity with their looks to know whether differences are within the limit of variation for the species or useful features for interspecies distinction. Also, mycologists are so used to identification by microscopic morphology that often it is easier for them to go straight to the microscope without spending too much time noting minute discrepancies of appearance.

Genus *Chlorociboria* is quite common in our province. Everybody exploring our woods has seen hardwood sticks or logs with a distinct blue-green (cyan-turquoise-cerulean) colour. This colour comes from the mycelium of the fungus. The mycelium is commonly seen, the mushroom sel-

dom. It can be found fruiting on blue-green wood throughout the season in moist places or after a prolonged wet spell; most commonly fruiting bodies persist on the underside of such wood. Thus, if you want to see the little cups, turn the stained wood over and look carefully. The mushrooms are small, 1-8 mm in diameter.

Our two species are *C. aeruginascens* and *C. aeruginosa*. For some reason, *C. aeruginascens* is the favoured species, mentioned in most texts. Of six commonly used books of mushrooms (Arora, Barron, Bessette et al, McNeil, Miller, Phillips), one describes neither and five describe only *C. aeruginascens*. Three mention *C. aeruginosa* in passing as a similar smaller species, but do not give a size range. One says it is more yellowish-green than the blue-green of *C. aeruginascens*. One text erroneously states that *C. aeruginosa* does not stain wood. Four texts quote the same spore size for *C. aeruginascens*, while the fifth states the difference between the two can only be determined by spore size without giving the size for either. Most of more specialized texts agree that the two can only be separated microscopically, *C. aeruginascens* having spores almost half the size of those of *C. aeruginosa*. It should not be a wonder, then, that most of us automatically call all blue-green wood-staining small cups *C. aeruginascens*, without too much critical analysis. We have collected such specimens on every foray on the island (but not from Labrador so far) and this is the name given to all.

We decided to examine all this year's specimens microscopically to answer two questions:

1. Do we have both species in Newfoundland?
2. Can they be differentiated by gross appearance alone?

The answer to both was YES. We found both species: four collections of *C. aeruginascens* and one of *C. aeruginosa,* separated microscopically by Heidi Tamm. On the basis of these collections, the two could be told apart quite readily by macroscopic appearance alone, as illustrated in Figure 1.

Ordinarily, one collection is an inadequate sample on which to base a conclusion. However, the difference is so obvious and is supported by all published accounts claiming macroscopic differences between the two. Then, you might ask, why study them if their differences are well described? Well, as you saw above, the differences are not always well described and many authorities state that macroscopically the species are indistinguishably similar. These conflicting opinions made it necessary to examine them for ourselves.

Table 1 sums up their main differences collated from those published accounts that claim the two species differ macroscopically. Mushroom and spore icons are drawn to scale and an attempt is made to capture the mushroom colour difference; the icons do not show the colour in the hymenium (bottom of the cup), where the difference is most obvious. Compare this table to Figure 1 to see how well our specimens agree with published accounts.

On the basis of these findings, in retrospect it seems to me that *C. aeruginosa* is the more common species here in the Humber Valley, where we live, because the mushroom I have seen most often in these woods, is small with a light yellow to yellowish-green hymenium. Elsewhere, it would seem that *C. aeruginascens* might be more common. A quick look at the little green cups photographed from past forays suggests that *C. aeruginascens* is the correct identification for the pictured specimen in 2004 and 2005, and probably also in 2007. The foray pictures, of course, do not identify the unphotographed species collected in those years.

In the light of this understanding, the picture in my book[1] on p. 241 is misidentified and should be *C. aeruginosa*. You may not appreciate it from the angle but I have other pictures of this same specimen from different angles, where a light greenish-yellow hymenium is obvious. The next edition will describe both species.

What do these mushrooms do? We are not entirely certain. It seems that they are saprophytes but are not classical wood decay fungi. They cause neither white nor brown rot (and we do not recognize green rot). Although most of the wood

we see them on is decayed to some extent, this is probably the work of other organisms. During the Renaissance the stained wood was used in Italy for wood inlays; 400 years later it was used in England to decorate small wooden boxes (Tunbridge ware). The dye is known to inhibit plant germination and is one of many mycological chemicals being investigated for its anti-cancer properties. For us they are a joy to find—a proper test for our macro lenses.

Next time you see a blue-green piece of wood, think of what causes it and see if you can spot a few fruiting mushrooms, knowing they are usually found on the moist underside.

REFERENCE

1. Voitk, A. (2007). *A little illustrated book of common mushrooms of Newfoundland and Labrador.* Rocky Harbour, NL: Gros Morne Co-operating Association.

Table 1. Macroscopic and microscopic morphological differences between our two Chlorociboria species, culled from various printed and web sources

CHLOROCIBORIA			***AERUGINOSA***	***AERUGINASCENS***
CAP	**diameter**	**range**	1-6	2-10
		average	4	6
	colour	**inside cup**	light green	blue-green
STEM	**length**		<3	>3
WHOLE MUSHROOM				
SPORES	**length**	**range**	9-13	5.5-8
		average	11	6.75
	width	**range**	1.5-3	1.5-2
		average	2.5	1.75
SPORE