

Succumbing to *Cortinarius*

by Michael W. Beug

Over the 40 years that I have been collecting mushrooms I have periodically collected and tried to identify *Cortinarius* mushrooms. In the early days Dr. Alexander H. Smith (University of Michigan) and Dr. Daniel Stuntz (University of Washington) would kindly name my collections. More recently Dr. Joe Ammirati (University of Washington) has been the recipient of my collections. However, over the 40-year span, I mainly learned to walk the other way when I spotted a *Cortinarius*. Then in the summer of 2008, my attitude began to change.

It all began with the “Horse Whisperer Poisonings.” Most of you already know the story. On Saturday August 23, 2008, Nicholas Evans, author of *The Horse Whisperer*, and his wife Charlotte were collecting wild mushrooms for dinner on her brother’s estate near Forres, Scotland. According to most reports, the two afflicted couples thought that they had picked Chanterelles. However, Marilyn Shaw called Dr. Roy Watling, long ago known as the “boy wonder of mycology,” and learned that the victims thought that they had found “ceps.” What they had actually found was given in press reports as *Cortinarius speciosissimus*, which has also been known as *Cortinarius orellanoides*. Some authors consider both or these species a synonym of *Cortinarius rubellus* (Fig. 1). The following day, Sunday, Sir Alistair had an upset stomach, and by late in the day he called a doctor whereupon all were told to get to a hospital quickly. By Tuesday, the two men, who had eaten the most, were transferred to the renal unit for kidney dialysis and eventually kidney transplants. Their wives began kidney treatment on Wednesday.

Cortinarius rubellus, a species associated with conifers, is often fatal, as is *Cortinarius orellanus*, a European species associated with oak and sometimes beech and hazel. In the last British case of poisoning by this *Cortinarius*—30 years ago—two people wound up requiring kidney transplants.

While this news was breaking in early September, I was already working on the first ever known serious poisoning by a *Cortinarius* species in North America. At the beginning of August Gary Lincoff had e-mailed me to say that he had been asked about a poisoning involving kidney failure. I said it was probably not caused by orellanine, the toxin in some *Cortinarius* species, but by the toxins in some species of *Amanita* in section *Lepidella* or by *Paxillus involutus*. I told Gary how to do a presumptive spot test for orellanine in which some of the dried mushroom is crushed in water, filtered, and mixed with an equal volume of 3% ferric chloride in 0.5 N HCl. The solution turned dark gray-blue—positive for orellanine. Gary arranged for the dried material to be sent to

Dr. Ammirati, who observed that the dried material resembled *Cortinarius orellanus* and that the microscopy was a fairly close match to a collection of *Cortinarius orellanus* from Trento, Italy. The Italian material and the material from the poison case were then shipped to Brandon Matheny, at the University of Tennessee, who found that the ITS sequences were 97% similar. In short, the American material is a new species closely related to *Cortinarius orellanus*. The mushrooms had been found under an oak tree in Ada, Michigan, on July 11, 2008. After months of kidney dialysis the unfortunate woman who ate them recovered. A paper or two will appear one day telling more about this case and covering both the clinical aspects and the mycological sleuthing. Dr. John Trestrail and Dr. Bryan Judge of Helen DeVos Children’s Hospital will be two of the authors of the clinical report.

Because of these two incidents, I went to the NAMA meeting in McCall, Idaho, September 2–7, 2008, thinking more than ever about *Cortinarius*, but I was not yet fully hooked. On the first foray Carlene Skeffington brought in a beautiful *Cortinarius* (Fig. 2) that struck me as somewhat similar to the deadly *Cortinarius rubellus*. When I examined it under a UV light, I imagined that I could see a weak blue fluorescence—and orellanine characteristically produces a blue fluorescence. I borrowed a copy of *Corti-*



Figure 1. *Cortinarius rubellus*, photographed by Christie Robertson.



Figure 2. *Cortinarius californicus* from McCall, Idaho.



Figure 3. *Cortinarius* in subgenus *Telamonia*.

narius *Flora Photographica* (Brandrud et al., 1992) and decided that the mushrooms we had looked a lot like the pictures of *Cortinarius rubellus*. However, at the foray I was the *Ramaria* person, so Joshua Birkebak, a student working with Joe Ammirati, did the microscopy and took the material back to Joe, who later reported that we had been looking at *Cortinarius californicus*, a species that I thought I knew well. I had just wanted too badly to have finally seen a specimen of the very rare *Cortinarius rubellus*.

Friday night of the foray there was a book auction to raise money for the NAMA endowment; included in the auction were the first two volumes of *Cortinarius Flora Photographica*. I made an early bid, but soon the bidding went far beyond my means and the means of my good friend Drew Parker, who also dearly wanted the book. Fran Sundberg was the successful bidder. Much to my amazement and pleasure, later that evening she presented me with the two volumes that she had just purchased. I felt guilty. I was not working on *Cortinarius* and did not intend to start.

Less than two months later I was just finishing up with the grape harvest at my home, Oak Hill, in the Columbia River Gorge. The Chardonnay, the Riesling, and the Muscat wines were already racked, and as I was about to press the Cabernet Franc, Cabernet Sauvignon, Nebbiolo, and Pinot Noir, I received an e-mail from Joe Ammirati asking about *Cortinarius* in the subgenus *Phlegmacium* associated with oaks. My interest in mushrooms associated with oaks has been growing steadily since my home was relocated to the middle of a grove of Oregon White Oak, *Quercus garryana*. I had never seen a single *Phlegmacium* associated with oaks in Washington or Oregon. Indeed the only *Cortinarius* that I had collected in this habitat was a species (Fig. 3) that I had been unable to name growing in a mixed oak and Ponderosa pine habitat. It was clearly a *Telamonia*, a group that is difficult even for *Cortinarius*. Nevertheless, I walked over to a particularly pure stand of oaks just west of the house where no intermixed Douglas fir or Grand fir or Ponderosa Pine was present. Walking along a very old logging road, I

did not see the first two collections of *Cortinarius* buried under the leaves until I had trampled them. In an hour I had come up with four different *Cortinarius* species. As Joe had instructed, I checked the reaction for the cap cuticle, upper stipe, stipe base, and context with 10% KOH. For good measure I also checked for UV fluorescence and then sent images off to Joe. Within hours, Joe responded that all four collections were of species he had never seen before! Three were in the subgenus *Phlegmacium*. Figure 4 is the only *Phlegmacium* that I did not trample that day.

The following week I went to the home of some new friends, Tom Cope and Jan Muir (John Muir's granddaughter), who live along the White Salmon River. I was to take them on their first-ever mushroom hunt. In the morning we went downriver into a mixed fir forest and found wonderful diversity including lovely collections of *Cantharellus cascadenis*, a giant Yellow Chanterelle; and even though it was mid-November, long past normal King Bolete season in our area, there was one prime *Boletus edulis* buried deep in the duff. We also found one single *Dermocybe*. There were no other Corts. At lunch, looking upriver from their home, I noted beautiful groves of Oregon White Oak, and so we headed there after eating. I was eager to find more collections of *Phlegmacium*. We collected a beautiful basket of *Lepista nuda* and the Fried Chicken Mushroom, *Lyophyllum decastes*, but not a single *Cortinarius*. Arriving home, my wife, still not trusting my taxonomy after 40 years, refused to try either the *Lepista nuda* or the *Lyophyllum decastes*.

Not wanting the mushrooms to go to waste, the next day I headed out to my favorite commercial winery. Syncline Winery is owned by James and Poppy Mantone, and they both love mushrooms. I had nestled the lavender Blewits and the tan Fried Chicken Mushrooms in a beautiful African basket that Paul Stamets and Dusty Yao had given me the previous Christmas. The mushrooms were a real attraction to visitors in the tasting room at Syncline. Then James came over to describe this spectacular mushroom he



Figure 4. *Cortinarius* 01mwb111008 in subgenus *Phlegmacium*.

had found the previous week—it was good-sized with a viscid bright yellow cap and a lavender stipe with rusty brown spores. James said it was so spectacular and so distinctive he was certain he would find it in Lincoff's book, *The Audubon Society Field Guide to North American Mushrooms*. But James's description was unlike anything I had ever seen anywhere. James led me to the one-acre Oregon White Oak grove behind his house, and beneath several of the oaks there were clumps of *Cortinarius*. I collected five different large members of the *Phlegmacium* subgenus, but we did not find the mushroom James had described. We then moved out of his maintained grove into the adjacent dry streambed and explored under oaks where there was neither tilling nor mowing—we found nothing more there. At home I worked up the collections as before and sent the information in an email to Joe. Again I promptly heard back—five more species unlike anything that Joe had ever seen before.

At this point Dr. Ammirati was eager to come and see for himself. It took him two weeks to get a day free just before Thanksgiving. In the meantime, I searched for more new species but rarely saw a single *Cortinarius*. I was looking under the oaks in relatively undisturbed habitats. When I did find something, it was always *Cortinarius albofragrans* (Fig. 5), a mushroom that Joe had named from California material but a species that according to Joe had never previously been reported from Oregon or Washington.

I arranged to meet Joe just after noon at Syncline and suggested a couple of places that I had not checked yet for him to stop at on the way. When I arrived at Syncline, Joe had just started to talk to James. He was excited, even though he yet had no clue as to what we were about to find. Though his first two stops turned up nothing, his third stop on the way to Syncline had turned up several more new species in and along a very old roadbed. Meanwhile, James had called me that morning to say that things were really popping in his backyard. In about two hours we filled both of Joe's baskets to overflowing and had filled mine as well, in-

cluding some new species of *Cortinarius* that I had not found there two weeks earlier. Still there was nothing under the undisturbed oaks along the adjacent dry streambed.

We then went to a farm nearby where I showed Dr. Ammirati the only *Russula* (Fig. 6) other than members of the *Russula brevipes* group that I have found in pure oak stands. Like the *Cortinarius* species we had been finding, this *Russula* appears to be an unnamed species. Nearby was the only *Boletus satanas* that Joe had ever seen in Washington or Oregon. We also found two or three additional new *Cortinarius* species, including one (Fig. 7) that Joe commented had the aspect of a *Leproclybe* but was unlike any other that he had ever seen. The spores were globose, and it gave a bright yellow UV fluorescence. Our last stop a few miles away at a large oak stand turned up not a single *Cortinarius*, in sharp contrast to the abundance we had just been enveloped in. We never did find the viscid bright yellow species with a lavender stipe.

In the summer I plan to return with Dr. Peter Kennedy of Lewis and Clark College (if he can break free of other research) and examine the mycorrhizae on the roots of the oaks and see



Figure 6. *Russula* sp similar to *Russula alutacea*.



Figure 5. *Cortinarius albofragrans*.



Figure 7. *Cortinarius* img0803 in subgenus *Leproclybe*.



Figure 8. *Cortinarius* 04mwb111508 close to *Cortinarius sodagnites*.

what is underground. Previous studies of mycorrhizae on *Quercus garryana* in Oregon (Valentine et al., 2004; Subban and Murphy, unpubl.) have found that there was little correlation between what they saw fruiting and the mycorrhizae on the roots. Neither reported *Cortinarius* species. I expect that I will be looking under the oaks for Corts for years to come. We have found some very beautiful species like the ones illustrated in Fig. 8 and 9. I have many questions. Why were we mostly finding *Cortinarius* species on disturbed ground, though often the disturbance was over half a century ago? Why had not William Suksdorf (1850–1932) reported some of these *Cortinarius* species a century ago? He lived and studied just six miles from where most of these collections were made. This important pioneer botanist was a friend of Asa Gray and made off with over 150,000 collections of the plants and fungi of the area, with 70 species and one plant genus, *Suksdorfia*, named after him. As a result of these taxonomic and ecological questions I have succumbed to *Cortinarius* fever. To make matters even worse, as we parted at the end of that glorious day collecting *Cortinarius*, Dr. Ammirati pointed out that the Mount Adams area just 20 miles north of my home was largely unexplored for *Cortinarius*.

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Figure 9. *Cortinarius* 03mwb112508 in subgenus *Phlegmacium*.

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