

The reason for its milky-white coloration is due to a unique aspect of mayfly developmental biology—they are the only insects to develop fully functional wings before their final molt to adulthood. This stage, called the sub-adult or subimago, emerges from the water where it spent the past year as a nymph (also called a naiad) and flies to nearby vegetation, but it is still not mature. One additional molt is required; wings and all, before the insect finally reaches adulthood and can spend the few remaining hours of its life in single-minded pursuit of a mate. Sub-adult mayflies are distinguished from their adult counterparts by their paler coloration and opaque rather than clear wings. We can also tell that this individual is a female because no claspers are visible at the tip of the abdomen (which males possess for mating) and its relatively small eyes (the eyes of males almost completely cover their head).

My thanks to [Dr. Robert Sites](#), who initially suggested this might be a species in the family Heptageniidae, and to [Roger Rohrbeck](#) for confirming my subsequent identification as probably belonging to the genus [Maccaffertium](#).



Missouri's Largest Planthopper

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Although I have long dedicated myself to beetles, I must confess that my first love was the so-called “Homoptera”—that now defunct order² containing some really cool bugs (cicadas and hoppers—i.e., leafhoppers, treehoppers, planthoppers, froghoppers, armadillohoppers³, etc.) and some not-so-cool bugs (aphids, whiteflies, mealybugs, and their kin) that turn out to be not-so-closely-related to the cicadas and

¹ Originally posted 13 November 2014 at the author's website: <http://beetlesinthebush.wordpress.com>. Photos by the author.

² The homopterans have since been subsumed within the larger order Hemiptera (true bugs)—an irritating but necessary consequence of molecular studies that have shown rather conclusively that hoppers and cicadas are more closely related to the other true bugs than they are to the group containing aphids, whiteflies and mealybugs.

³ Okay, this is not a real thing!

hoppers as some of the other “true” bugs. Perhaps you already sense that it was only the cicadas and hoppers that I really liked to begin with, the other mentioned groups being... well... boring from my perspective as a collector (overwhelming numbers of tiny, soft-bodied, sessile insects that required preservation in alcohol or on slides⁴). Even within the “cool” homopterans, however, some groups interested me more than others. Leafhoppers were okay, but my interest in them derived mostly from the fact that they were the subject of my thesis work. Treehoppers, on the other hand, were my favorite because they were just so adorably bizarre, and cicadas also fascinated me due to their size and behavioral charisma.

The planthoppers also interested me, although many of the various families contained within the group seemed not much different to me than leafhoppers. One family, however, stood out—the Fulgoridae. Much larger than the other planthoppers, they seemed like a cross between a planthopper and a small cicada (okay, a very small cicada)—combining the hopping capabilities of the former with the size (almost) of the latter. I only rarely encountered these bugs in Missouri; actually it was only a single species that I ever found—*Poblicia fuliginosa*, one of only two species in the family known to occur as far north as Missouri (Bartlett 2014). Moreover, when I did find them, they were extraordinarily wary and difficult to approach and collect. Vernon Brou, in a comment at this species' [BugGuide page](#), describes their capture-avoidance capabilities perfectly:

These are nearly impossible to capture by hand netting, they are rocket propelled. A most [frustrating] exercise in futility.—Vernon Antoine Brou, Jr., pers. comm. to Mike Quinn, 2012.

This past fall, while on a collecting trip in the White River Hills of extreme southwestern Missouri, I chanced upon a few individuals perching on the stems of prairie dock (*Silphium terebinthinaceum*) in a dolomite glade. Remembering how wary they were in my previous encounters, I figured I had little chance of successfully

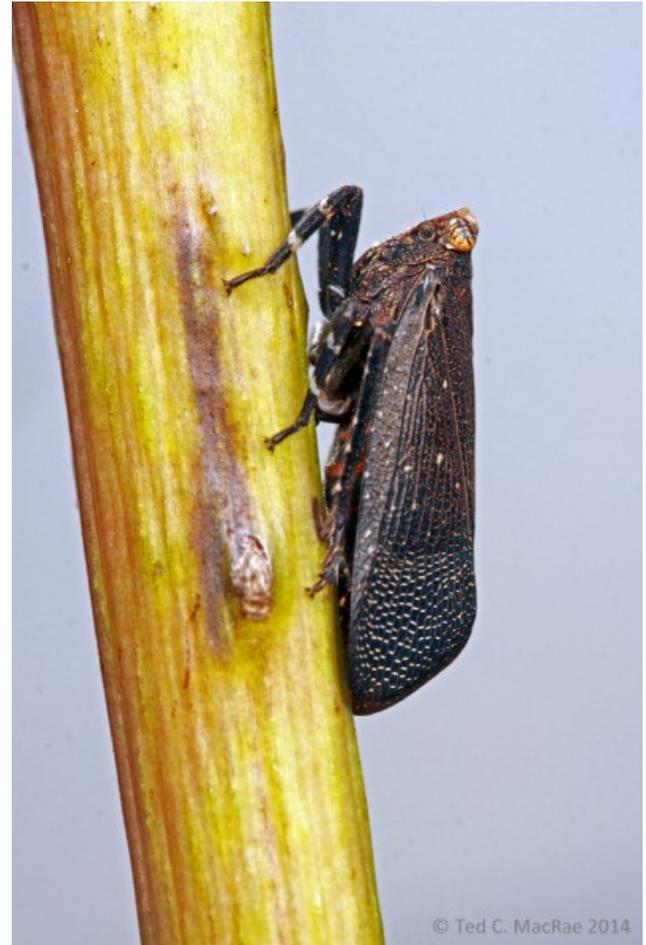
⁴ So, not only are they boring to curate, but they directly caused the first order of insects in which I became interested to be completely dismantled!



Poblizia fuliginosa on *Silphium terebinthinaceum* (prairie dock), Barry Co., Missouri.

photographing any of them. I love a challenge, however, and with the help of field mate Stephen Penn I managed to get the shots shown here. Getting within the range of focus generally caused the insects to dart around to the backside of the stem. I took advantage of this behavior by getting myself set and focusing the camera on the bug (even though it was behind the stem) and then having Stephen move his insect net slowly toward the bug from the side to get it to dart back around the stem away from the net... right into my field of view! The first individual we tried to photograph took off rather quickly (rocket-propelled!), but fortunately we found another individual in the same clump of stems and succeeded in getting some shots.

In the second photo the bright red abdomen is barely visible on the underside of the insect. The entire abdomen is, in fact, bright red in obvious contrast to the otherwise dark and somber coloration of the insect. I've searched the literature



The abdomen is brightly colored red (barely visible in this photo).

but can find no mention of the function of the red abdomen, but I presume it serves a flash coloration function similar to the bright green abdomen of some jewel beetles to confuse potential predators by its visibility in flight and then sudden disappearance when the insect lands and folds its wings over the abdomen. I suppose an aposematic function is also possible given the red coloration, but I'm not aware that any hoppers are known to be chemically protected, and the fact that the red abdomen is seen only during flight also suggests a non-chemically based function.

REFERENCES:

Bartlett, C. R. 2014 (and updates). Planthoppers of North America. Available at: <http://canr.udel.edu/planthoppers> (accessed 12 November 2014).