Exoskeleton Safari – the arthropods of Sharon

Let's start by simply enjoying this photo. The chrome green is utterly spectacular; seeing a color like this in nature gives me goosebumps. This particular photo was taken at Moose Hill Mass Audubon.

This beetle belongs to the family Cerambycidae, the longhorn beetles. It's not difficult to see how they got that name, just look at the length of the antennae! The longhorn beetles form a very large family of beetles, which themselves form a very large order of insects. There are 35,000 known species of the longhorn beetles – to compare, there are just 10,000 species of birds.

Longhorn beetle larvae live in plant matter, preferably plant matter that's already been stressed by other factors. Finding this plant matter is a tricky thing, and mama Cerambycids have a wonderful sense of smell that helps them detect chemicals given out by plants when they are stressed.

But they have another, trickier, strategy. There are other beetles, such as Scolytinid beetles, that also need to do the same thing. Why not let them do all the work? Instead of searching for the smell of stressed plants, many Cerambycid mothers search for the smell of Scolytinid larvae. There's a bonus from this policy: the Scolytinid larvae may then serve as food for the Cerambycid larvae.

Does it end here? Of course not, these are beetles we're talking about. There are in fact other beetles that try to search for the smell of Cerambycid beetles so they can do unto the Cerambycids as the Cerambycids do unto others. It's a universal truth: whatever "it" is, with bugs, it never stops.

To get more particular, this specific Cerambycid beetle belongs to the sub-family Lepturinae, the flower longhorn beetles; its latin binomial is Anthophylax cyaneus.

Now, back to the photo: look at the right antenna, near the base. Does something look a little unusual?

That turns out to be a creature called a pseudoscorpion. The pseudoscorpions form an order of Arachnids, so they're related to spiders, ticks, mites and yes, to scorpions. I'll start off with the question everyone wants answered: they're not particularly closely related to scorpions, and they're harmless to humans, although if any of the readers of this newsletter are ants, mites, or other small arthropods, then *please* watch your step in their presence.

That's all well, but… what's it doing hanging onto the beetle? Well, if you were half a centimeter in size, one of your challenges would be getting around. Places several hundred meters away, or a few meters high, would be almost impossible to get to. And yet, there's plenty of wonderful food, and candidates to mate with, in those locations.

How do we overcome this barrier? Pseudoscorpions simply grab hold of beetles and flies and use them as buses, to go from one place to another, looking for food and for love. Why would you evolve wings yourself, when just use someone else's?

(This behavior is a type of mutualism called commensalism, wherein one of the organisms benefits, while the other isn't affected – the beetle (usually) doesn't really benefit, nor does it significantly suffer. In particular, using another organism as transport is called phoresis.)

But that's not all. Unbeknownst to the beetle, it's not just a bus, it's a party bus too. Since there are pseudoscorpions on the beetle anyway, they also take the opportunity to look for mates among the

others who are also hitching a ride. The males fight with other males, and try to push them off, like sumo wrestlers, which is fairly funny when done by these awkwardly shaped little creatures a few millimeters in size. There can be a bustle of up to 20 or 30 pseudoscorpions milling around the beetle, with their own soap opera, their love and life and death, all while the beetle goes on with its own problems, equally dramatic.

Now: if you look a little closer, on the same antenna as the pseudoscorpion, a few segments further up, you can see another organism, perhaps an Oribatid mite, which is a hitchhiker itself. From the mite's point of view, there's yet more life and death drama: does it know that its natural predator is just a few millimeters away?

Remember what I said about bugs, that it never stops, whatever "it" is!