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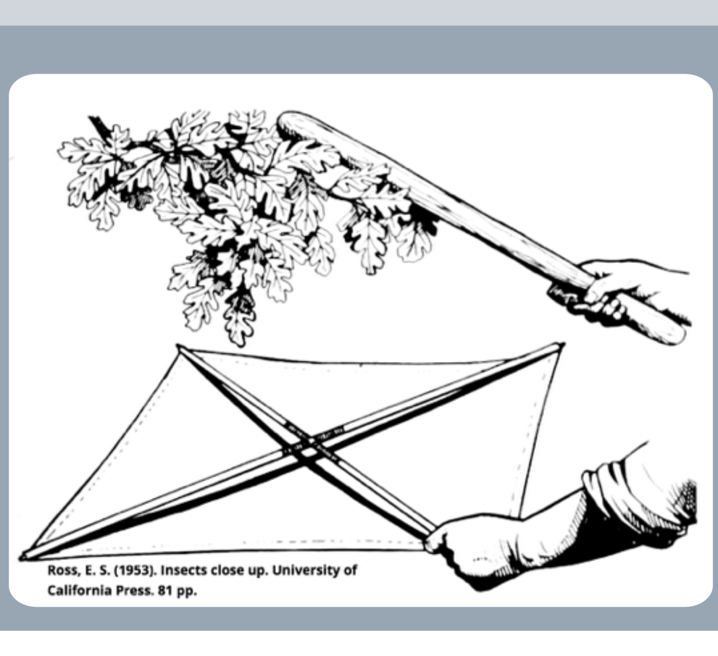
The Beat Sheet

Newsletter of the
Frost Entomological Museum
Summer 2020



Note: Our public museum is still closed due to COVID-19 safety precautions and Penn State regulations. We will let you know when we receive more information. Thank you for your patience!

Growing the Collection

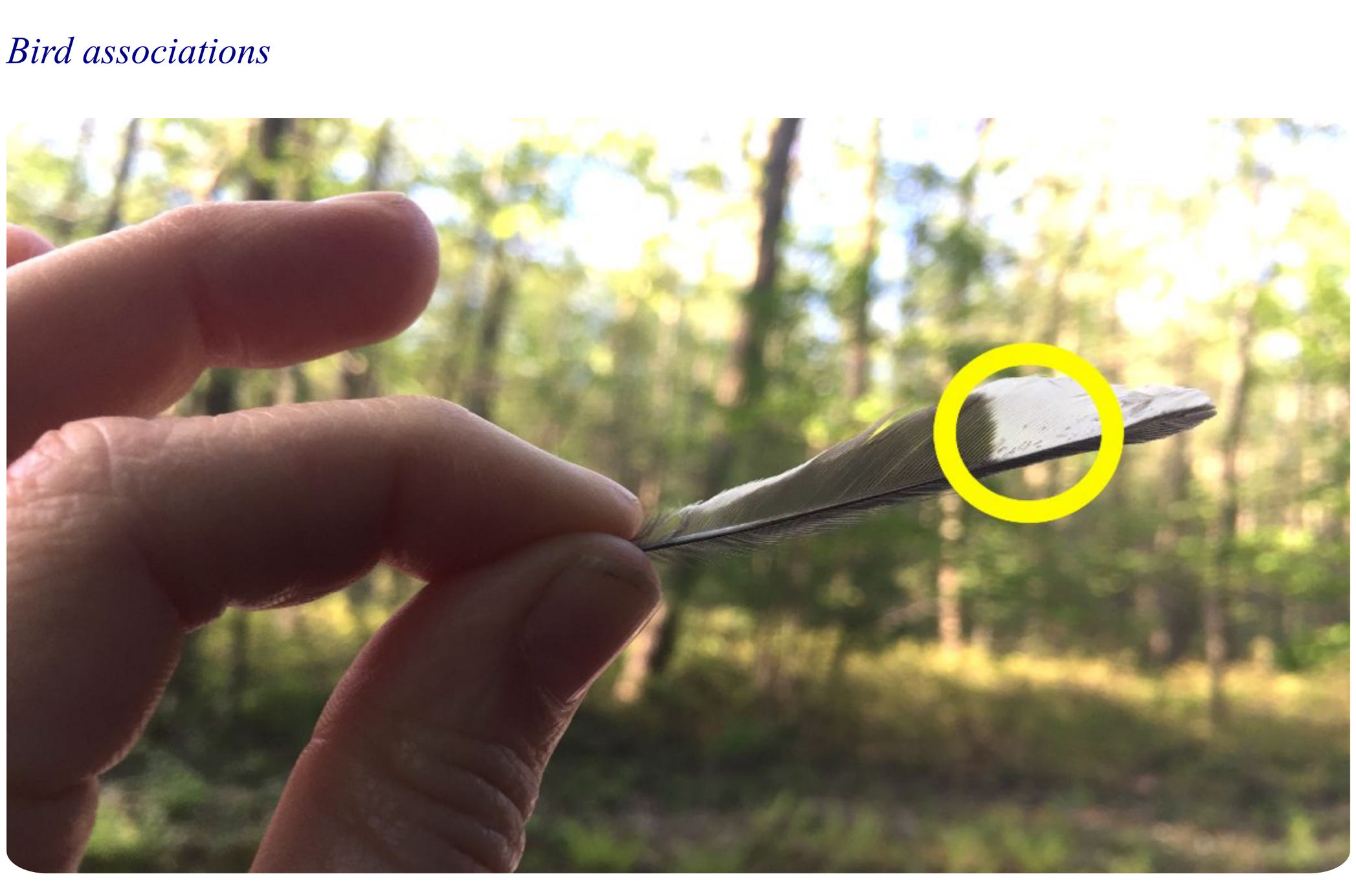
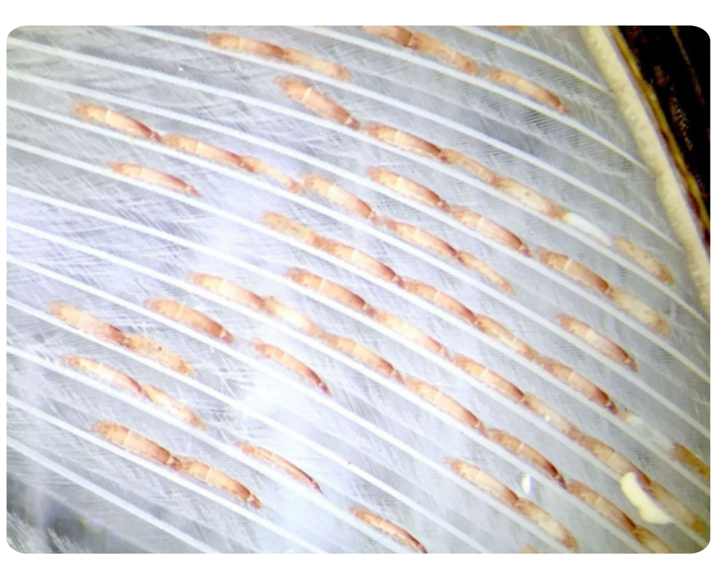
Social distancing and stay-at-home guidelines due to COVID-19 have changed the way we would have otherwise been collecting arthropods this summer season. We've set up traps in the backyard, spent time galling on our own, and co-opted the fieldwork of other members of our households. Although unexpected, this pandemic has led to some rich experiences, as well as interesting additions to the collection!

Pitfall trapping


Left: *Bird's eye view of a pitfall trap.* ***Right****: Arthropod's eye view of a pitfall trap.*

With a growing fascination in spiders and an interest in building the collection of mygalomorphs, a current collecting project is setting up pitfall traps in the backyard — fingers crossed we find some wandering males! While researching the best pitfall trap set up, we learned there are LOTS of different methods to use. There doesn't seem to be a consensus in the field for the best strategy or design, probably because there are so many things to consider — like avoiding vertebrate bycatch, what preservative to use, to-bait or not-to-bait, etc. We eventually settled on a design that is described in this blog post, and there are currently about a dozen set up in Andy's backyard, in a rocky forested area. Stay tuned — we can't wait to share with you what we find!

Bird associations


Top*: A feather with parasites.* ***Bottom Left****: mites stacked in rows along the barbs of a feather.* ***Bottom Right****: A warbler, Vermivora chrysoptera (Linnaeus, 1766), one of many species from which we collected arthropods.*

When we think about birds and arthropods, it makes sense that the first thought that comes to mind is the predator-prey dynamic. Everyone knows (and often appreciates!) that birds eat bugs. But what about those less recognized interactions? Birds host a wealth of unique arthropods that rely on them as their sole source of food and/or habitat — like ticks, lice, flies, and mites. Some of these interactions are parasitic (e.g. ticks, which feed on blood), but some are commensalistic, meaning the arthropod benefits but doesn't harm the bird (e.g. mites that feed on oil secretions from skin or feathers). This June we were able to piggy-back on the field work of Dave Toews to collect some of these interesting bird associated arthropods from wood warblers (Parulidae). The most common arthropods on these birds by far were the feather mites, and it did seem as though there were higher densities of mites in the more forested areas than open habitats. We'll likely continue sampling warblers over the next few years and continue to grow the Frost's collection of bird associated arthropods.

Summer Gall Highlights

Galling collecting efforts are in full force this summer, and we've highlighted some new and exciting observations below!

The most eye-catching gall goes to *Amphibolips nubilipennis*, commonly known as 'Translucent Oak Gall Wasp'. This gall is found on red oaks and looks like it could be popped like bubblegum! Surprisingly, though, it's solid all the way through with only a small inner chamber for the wasp to grow in.

Amphibolips confluenta, also known as Spongy Oak Apple gall, was refitted as a nest by an unknown species of leafcutter bee (Megachilidae). Although it's not unusual to find insects repurposing discarded galls, it is uncommon for leafcutter bees, which normally use straight, tube-like structures (e.g. plant stems) to lay eggs in. We can't find any other observations of this behavior in the literature, which makes it a pretty exciting discovery! Denise plans to describe this behavior in a short natural history observation note.

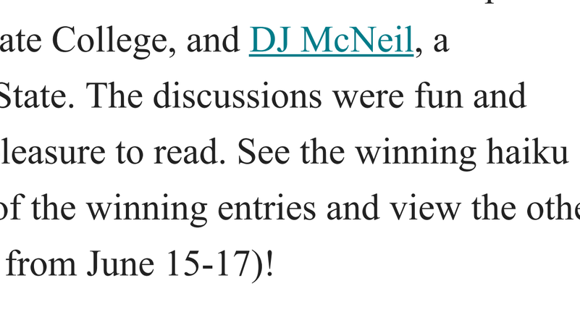
Last, we observed ants gathering *Callirhytis quercusoperator* pip galls from red oaks right up to the entrance holes of their colony. There were also plenty of empty shells of galls, which makes us suspect both the plant tissue and developing wasps are being consumed by the ants as a nutritional source.

Interested in learning more? Give a listen to Episode 77 of Arthro-Pod, where graduate student Denise Montelongo discusses the ins and outs of galls!

New Face at the Frost

This summer, the Frost welcomed our newest member, Louis Nastasi. He recently finished his undergraduate degree at Case Western Reserve University and has spent some time at both the Cleveland Museum of Natural History and the Smithsonian. He is passionate about insect biodiversity and evolution, and will be pursuing his Ph.D. in the Deans' Lab working on the evolution of wasps in the family Cynipidae. We are excited to have you join us, Louis!

Hexapod Haiku Highlights



Back in May we resurrected the Hexapod Haiku Challenge, an event Andy previously hosted when he was at NC State. We received more than 200 fantastic haiku submissions, some even accompanied by background information, observation notes, and hand drawn pictures! Thank you to everyone who participated, and also to the external judges who volunteered their time to help us — Anne Burgevin, a poet and naturalist living here in State College, and DJ McNeil, a conservation biologist and postdoctoral researcher at Penn State. The discussions were fun and insightful, and all the hexapod inspired haiku were such a pleasure to read. See the winning haiku below, and visit the Frost Museum's blog to read synopses of the winning entries and view the other haiku that were too good not to highlight and share (entries from June 15-17)!

warm rays join the horizon
flecks of illuminating creatures
weave through the tall grass
—***William Liu,*** *12 & Under Winner*

briefly
a butterfly
grasshopper
—***Brad Bennett****, 13 & Over Winner*

Inching along the
Snail is exhausted but must
Go on just a foot
—***Stella Loverich****, 12 & Under Winner*

Grasshopper
away,

Blur
of living energy

A
small green rocket
—***Lily Stone****, 12 & Under Winner*

cumulonimbus
the towering cloud
of gnats
—***Jeff Hoagland****, 13 & Over Winner*

Keep an eye out for the next *The Beat Sheet* this fall

If you are interested in hearing about specific topics or activities, let us know!

Become a Friend of the Frost

By becoming a Friend, you help equip the museum with the tools needed for *collections care*, provides resources for *student engagement*, and helps fund the *rotation of new exhibits* into the museum. Visit our website to learn more.

Your support helps us better engage the public, grow and maintain the collection, and provide opportunities to undergraduate students at Penn State

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