Banisteria, Number 40, pages 90-91
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Bug of the Month[1]

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I never cease to be amazed, while preparing insects for the museum collections, by how many of our local species, even very small ones, had been named and described by European specialists as long ago as 1800. The early pioneer collectors did a remarkably thorough job of scouring every kind of habitat, and did it without such modern gimmicks as black light traps, soil extraction funnels, or pitfalls. As a result, it is now unusual to turn up undescribed species of beetles, for instance, in Virginia. But by a curious history of benign neglect, just the opposite can be said about millipeds, not just in Virginia but almost any part of the world except western Europe, which has been thoroughly picked over.

The current list of about 110 kinds of millipeds recorded for Virginia is matched closely by the number of species found here over the past few decades but still not scientifically named and described, and this number increases on an annual basis. Under such conditions, the thrill of discovery wanes and describing the accumulation becomes a chore. But occasionally, a capture is made that transcends the tedium of "another one to be named" because it sheds sudden light into a dark maze of hypothetical fabrications.

One such discovery was made several years ago during random collecting, and against all odds of statistical probability. A team from the museum's Department of Recent Invertebrates was looking for a suitable site along the North Fork Holston River near Gate City to install a pitfall collection unit. All of the preferred lowland terrain seemed to be cleared for pasture or cultivation, or was subject to flooding, so attention had to be shifted to wooded hillsides, none of which seemed really promising. Finally a site was selected by default although little hope was held for a successful outcome. And this pessimism was born out for the next several monthly visits: only a sparse selection of common local species was captured. But when the traps were cleared on the visit of November, 1998, somewhat different, small pallid millipeds were noticed among the usual debris. At first they were taken to be only immatures of some other form. Laboratory examination made that same night showed, to the contrary, they were adults, and moreover, members of a group of species (classified in the genus *Rhysodesmus*) previously known only from Mexico, Guatemala, and western Texas, in which area there are dozens of species. The excitement level became very high!

Of course the animals belonged to an undescribed species, which was written up and published with immoderate haste in the museum's journal "*Myriapodologica*".[2] How could such an enormous geographic dislocation be explained? Some years ago, on the basis of studies of some related groups strictly native to eastern United States (and largely to the Appalachian region), I postulated that the **ancestors** of today's living species of *Rhysodesmus* left the Appalachians and migrated westward at a time when deciduous forests were continuous across what is now the Great Plains. Upon reaching the Mexican highlands, these immigrants must have found rich country unoccupied by related, already established millipeds, and so colonized the entire region quickly and successfully, producing dozens of rhysodesmid species. Later, as climate changes replaced the earlier forests in southern United States with semiarid grasslands, the Mexican populations were effectively isolated from their Appalachian relatives.

The fortuitous discovery of the Virginia *Rhysodesmus* was significant in two respects: it confirmed the postulated Appalachian origin of the genus, and more importantly, showed that *Rhysodesmus* had already acquired its present characteristics **before** it started the long trek westward, leaving a few "stay-at-home" species that managed to survive in the ancestral homeland. For this reason, the new discovery in Washington County, Virginia, was given the scientific name *Rhysodesmus restans*. The species name means "one who stayed behind."

Consider the odds against the discovery ever being made. It is probable that the species now exists only in small isolated populations, fragmented by forest clearing. The decision to conduct a survey in that particular part of the state was made primarily to introduce a museum presence there, and the selection of the actual pitfall site was governed by totally negative factors. It was certainly not a place that I (or any other entomologist) would have chosen: a thinly wooded hillside recovering from some former clearing disturbance. Given a choice, most millipeds (as well as beetles, spiders, and other soil arthropods) prefer moist mature broadleaf forests, and that of course is where collectors look for them. The odds against the pitfalls being placed in a spot occupied by the *Rhysodesmus* were a million to one.

[1]Originally published (without footnotes) in the early to mid-2000s in *Research and Collection Notes*, an informal, in-house newsletter for staff of the Virginia Museum of Natural History. Reprinted with permission of the Virginia Museum of Natural History, Martinsville, VA.

But the story has a sequel. With respect to rare, or rarely collected animals, there is a saying that their capture is often like getting tightly-packed olives out of a bottle: once you get the first one, the rest come easy. Within a few months after the discovery of *restans*, a closely related second species was found by pitfall operations in a cultivated field at Knoxville, Tennessee. The collector sent his material to Dr. Rowland M. Shelley at the North Carolina Museum of Natural Sciences, who named this species, again in "*Myriapodologica*", as *Rhysodesmus agrestis* ("of the fields").[3]

What do we learn from this story? That there are probably a lot of similar instances, which cannot possibly be anticipated, scattered through the Appalachian biota, and that surely includes many more small, isolated *Rhysodesmus* species. That one cannot possibly select, by logic or previous experience, the place in which the discoveries will be made - everything will depend on serendipity. And that living millipeds have a lot to tell us about the conditions under which their remote ancestors (just like our own) existed, dispersed, and evolved.

[2]Hoffman, R. L. 1998. An Appalachian species of *Rhysodesmus* (Polydesmida: Xystodesmidae: Rhysodesmini). Myriapodologica 5: 77-83.

[3]Shelley, R. M. 1999. A second east-Nearctic species of *Rhysodesmus* Cook (Polydesmida: Xystodesmidae). Myriapodologica 6: 19-22.