

A comparison of tardigrade diversity between the Big Thicket National Preserve and the Great Smoky Mountain National Park

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For the past 2 years, we have been collecting tardigrades (water bears) in the Big Thicket National Preserve in southeast Texas as part of an All Taxa Biodiversity Inventory (ATBI). Our inventory is based on methods used by Bartels and Nelson in their survey of tardigrades in the Great Smoky Mountains National Park (GSMNP). The Big Thicket lacks the altitudinal variation and habitat diversity of the GSMNP. Our experience in Louisiana, Florida, and Mississippi suggests that terrestrial tardigrade diversity in southern habitats may be lower than the Appalachians. Therefore, we do not anticipate finding as many species new to Texas or to science as Bartels and Nelson have found in GSMNP, but a doubling of the reported Texas tardigrade species richness is likely. In any event, comparing the GSMNP diversity with a survey in the Big Thicket of comparable sampling intensity and methodology will be instructive. Our collection includes lichen, moss, leaf litter, and aquatic samples from the 15 units of the Big Thicket. Of the 15 units, 7 have been sampled and analyzed for tardigrades. Terrestrial samples were placed in paper bags and aquatic samples were placed in plastic bags. Tardigrades were extracted from samples, mounted on microscope slides with polyvinyl lactophenol, and studied with phase contrast and DIC microscopy. A total of 113 samples have been analyzed: 105 moss, lichen, and leaf litter; and 8 periphyton. No tardigrades have been found in the 8 aquatic samples or in 31 of the terrestrial samples. Samples yielded 303 identifiable specimens. Moss, lichen, and leaf litter samples yielded 4 families and 6 genera. Species found thus far are: *Macrobiotus echinogenitus*, *Macrobiotus* cf. *harmsworthi*, *Macrobiotus* cf. *hufelandi*, *Macrobiotus* cf. *liviae*, *Macrobiotus richtersi*, *Macrobiotus tonolli*, *Milnesium tardigradum*, *Minibiotus intermedius*, *Echiniscus virginicus*, *Echiniscus tamus*, *Diphascon (Adropion) scoticum*, and *Pseudechiniscus brevimontanus*. Species new to Texas are *Macrobiotus tonollii*, *Echiniscus virginicus*, *Diphascon (Adropion) scoticum*, and *Pseudechiniscus brevimontanus*. Overall, the diversity of species and higher taxa found in the BTNP so far is much lower than that reported from the GSMNP. This is consistent with other surveys of tardigrades in the Gulf Coast region of the Deep South.