Paysonia

A New Name for a Hybrid Bog Clubmoss from the Southeastern United States

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Abstract

A previously unnamed hybrid between *Lycopodiella alopecuroides* (L.) Cranfill and *L. prostrata* (R.M. Harper) Cranfill is formally described as *L.* × *shortii* D.D. Spaulding. The specific epithet honors pteridologist John W. Short, whose contributions to the study of Alabama ferns and lycophytes span over five decades. This hybrid displays an intermediate morphology, combining traits of both parental species. It is currently known from scattered populations in the southeastern United States, primarily within the Coastal Plain from Florida to Texas and north to North Carolina.

Introduction and taxonomic treatment

Members of the genus *Lycopodiella* Holub (Lycopodiaceae) are creeping to ascending lycophytes that inhabit acidic, open wetlands throughout much of the eastern United States (Wagner and Beitel 1993). Among them, *L. alopecuroides* and *L. prostrata* are prominent species in the Coastal Plain flora and occasionally grow in close proximity. Although putative hybrids between these taxa have long been suspected, they have remained undescribed until now. This paper formally names and describes a new taxon, *Lycopodiella* × *shortii*, a morphologically intermediate hybrid that exhibits traits of both parents.

> **LYCOPODIELLA × SHORTII** D.D. Spaulding, **hybr. nov.** (pro sp. hybr.: *Lycopodiella alopecuroides* × *prostrata*). **TYPE: USA. Alabama**. Escambia Co.: US-29 in Conecuh National Forest, about 2 miles west from Covington Co. line. Roadside ditch. 21 Oct 1982, *John W. Short 1301* (holotype: AUA, Figure 1).

Lycopodiella × *shortii* is morphologically intermediate between *L. alopecuroides* and *L. prostrata* (Figure 2). It can be recognized by its loosely featherlike appearance, partially arching and weakly rooted main stems, and bushy strobili with widely spreading sporophylls. The hybrid differs from *L. prostrata* in having less consistently rooted main stems and a less distinctly flattened leaf arrangement. It can be distinguished from *L. alopecuroides* by its smaller, less robust strobili and more delicate growth form.

The main stems typically creep flat along the soil surface, occasionally arching slightly and exhibiting rootless zones—segments lacking adventitious roots. Horizontal stems are less than 5 mm thick and may be sparsely branched. Leaves spread nearly horizontally, imparting a feathery appearance and giving the leafy stem a flattened to elliptic shape in cross-section; total leaf spread may exceed 1 cm. Fertile shoots are erect, unbranched, and may reach up to 30 cm in height.

Figure 1. Type specimen of *Lycopodiella* × *shortii*. Photo courtesy of John D. Freeman Herbarium at Auburn University (AUA).

Leaves on the upright stems are ascending and weakly spreading. Strobili are bushy, up to 2 cm in width, with sporophylls much longer than the sporangia and spreading widely at nearly right angles. This hybrid grows in sandy, acidic soils of ditches, meadows, and pinelands, typically in full to partial sunlight. Like its parent species, it inhabits wet, open environments that experience seasonal fluctuations in water availability. *Lycopodiella* × *shortii* is endemic to the southeastern United States and has not been documented outside this region. It appears to be infrequent and scattered in the Coastal Plain, where the ranges of both parental species overlap sympatrically — from Florida west to Texas and north to North Carolina. As with many bog clubmosses, it is easily overlooked and may be more widespread than current records indicate (Short and Spaulding 2012).

Despite its subtle distinctions from its progenitors, *Lycopodiella* × *shortii* is readily identifiable by its distinctive intermediate morphology. This paper presents the first formal description of the hybrid, which, until now, has remained unnamed and poorly understood. The epithet honors John W. Short, a long-time student of Alabama's ferns and lycophytes and senior author of Ferns of Alabama (Short and Spaulding 2012). His decades of fieldwork and curatorial contributions have significantly advanced our knowledge of pteridophyte diversity in the region. The common name Short's Bog Clubmoss is proposed in recognition of his contributions.

In the southeastern Coastal Plain, *Lycopodiella alopecuroides*, *L. prostrata*, and *L. appressa* (Chapman) Cranfill frequently occur in the same habitat and readily hybridize (see key below). Two additional named sterile hybrids have been described from this complex: (1) *Lycopodiella* × *copelandii* (Eiger) Cranfill (*alopecuroides* × *appressa*) is characterized by its horizontal stems that are partly prostrate and weakly arching, often rooting at the tips and occasionally along the middle. Its sporophylls are ascending, intermediate between the widely spreading ones of *L. alopecuroides* and the tightly appressed ones of *L. appressa*. (2) *Lycopodiella* × *brucei* Cranfill (*appresa* × *prostrata*) has fully prostrate horizontal stems that are somewhat feathery, though less so than those of *L. prostrata*, and bears sporophylls that are looser than those of *L. appressa* (Cranfill 1981, Eiger 1956). Notably, the reticulogram presented in Flora of North America incorrectly listed the parentage of *Lycopodiella* × *brucei* as *L. alopecuroides* × *L. prostrata*, when in fact it is *L. appressa* × *L. prostrata* (Wagner and Beitel 1993).

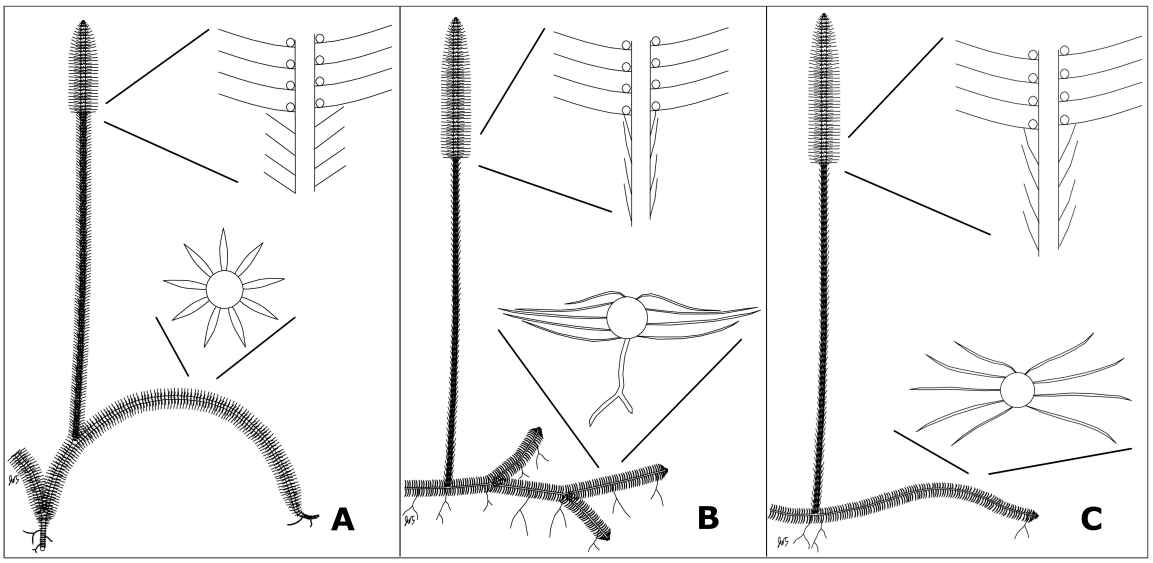

Figure 2. **A**. *Lycopodiella alopecuroides*. **B**. *Lycopodiella prostrata*. **C**. *Lycopodiella* × *shortii*. Upper detail, longitudinal section of strobili and upper stalks. Lower detail, transverse section of main stems. Drawings by John W. Short (from Short and Spaulding 2012).

Key to bog clubmosses of the southeast

1. Vegetative stems prostrate, lying flat on the ground and rooted throughout.
    2. Sporophylls (spore-bearing leaves) ascending and tightly appressed; vegetative leaves of horizontal stem spreading in all directions except downward ..... ***L. appressa***
    2. Sporophylls spreading outward; vegetative leaves of the horizontal stem spreading mostly laterally, forming a distinct two-ranked, featherlike arrangement.
        3. Strobili bushy; sporophylls spreading nearly horizontally; two-ranked leaf arrangement on main stem clearly visible ..... ***L. prostrata***
        3. Strobili slender; sporophylls spreading upward at a sharp angle; two-ranked leaf arrangement less distinct, typically evident only by a tendency of the leaves to lean to one side of the stem or the other ..... ***L. × brucei***
1. Vegetative stems arching, at least slightly, with zones lacking adventitious roots.
    4. Strobili slender; sporophylls spreading at an acute angle to the stem ..... ***L. × copelandii***
    4. Strobili bushy; sporophylls spreading nearly horizontally from the stem.
        5. Horizontal stems strongly arching, rising several centimeters above the ground; main stem leaves spreading in multiple directions ..... ***L. alopecuroides***
        5. Horizontal stems weakly arching, rising slightly above ground; main stem leaves weakly two-ranked, typically evident only by a tendency of the leaves to lean to one side of the stem or the other ..... ***L. × shortii***

Discussion

Recent floristic studies have emphasized the need for continued research on *Lycopodiella* diversity in the southeastern United States. The genus exhibits considerable morphological variability, and several taxa remain poorly defined. Weakley et al. (2025) suggest that the Coastal Plain may harbor additional cryptic or semi-cryptic entities, potentially including unrecognized hybrids or ecotypes. Focused fieldwork, combined with cytological and molecular analyses, will be essential for clarifying species boundaries and understanding the broader evolutionary dynamics of *Lycopodiella* in the region.

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