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Field studies by Peck et al. (1987) from 1985 until 1987 demonstrated that the bog clubmosses of southern Arkansas were represented by four distinctive species and three hybrids. Before that time all collections were identified as a single species, designated as *Lycopodium appressum* (Chapm.) Lloyd & Underwood or by the orthographic variant *L. adpressum*. This species had been reported (Smith 1978) from seven counties: Clark, Hempstead, Lafayette, Nevada, Ouachita, Saline, and Union. (We have been unable to verify the Lafayette County report.) Peck et al. (1987) added Calhoun and Garland Counties to the known range of *L. appressum*, and Smith (1988) indicated the addition of Hot Spring County. The three new species and three new hybrids were found only in Calhoun County by Peck et al. (1987). The report of these taxa in Calhoun County led to our speculation that of them might occur in clubmoss sites we had visited earlier with the presumption that only *L. appressum* occurred in our area.

The purpose of our study was to reevaluate clubmoss populations we had previously identified as *L. appressum*, and to search for new clubmoss locations. We are grateful to Mr. Don Crank for showing us a special area on the border of Hot Spring and Saline Counties, and for assisting with photography and field work. We are grateful to Mr. Carl Amason for showing us the clubmoss populations in Calhoun County, and for presenting us with copies of Snyder and Bruce's *Field Guide*.

Arkansas botanists have generally followed the traditional recognition of a broadly defined genus *Lycopodium*. Modern biosystematic studies support dividing the clubmosses into a number of more precisely defined genera. The many extensive studies of clubmoss systematics were recently summarized by Wagner and Beitel (1992), Øllgaard (1992), and Wagner (1992). Øllgaard (1992) treated all bog clubmosses which occur in our area as members of the genus *Lycopodiella* Holub, while Wagner and Beitel (1992) segregated the Carolina bog clubmoss as *Pseudolycopodiella caroliniana* (L.) Holub. In the present study we have adopted the more conservative delineation of Øllgaard. Our identifications of species and hybrids are based on keys, descriptions, and illustrations in Bruce (1975, 1976) and Snyder and Bruce (1986). Comparisons were also made with Correll and Johnston (1979). The four species recognized are *Lycopodiella appressa* (Chapman) Cranfill, *L. alopecuroides* (L.) Cranfill, *L. prostrata* (Harper) Cranfill (all in Section *Lycopodiella*) and *L. caroliniana* (L.) Pichi-Serm., isolated in Section *Caroliniana* (Bruce) B. Øllgaard. The hybrids considered are *Lycopodiella* x *copelandii* (Eiger) Cranfill (*L. alopecuroides* x *appressa*), *L.* x *bruceii* Cranfill, (*L. appressa* x *prostrata*), and *L. alopecuroides* x *prostrata*. Nomenclature is based on Cranfill (1981) and Øllgaard (1992).

The study was initiated in September 1992 when Mr. Don Crank called attention to a site northeast of Malvern, Arkansas, where clubmosses were found on each side of a road on the boundary between Hot Spring and Saline Counties. Upon initial investigation the plants appeared to represent more than one taxon, and additional trips were made for field study, photography, and collecting specimens. Each of us made a separate trip with Carl Amason and Don Crank to clubmoss sites in Calhoun County (DLM on July 5, 1992, JRB on November 7, 1992) to become familiar with *Lycopodiella alopecuroides*, *L. prostrata*, and *L. caroliniana* in the field.

In Clark County local clubmoss populations north of Arkadelphia were searched for variations. New vouchers were collected for study, and earlier specimens housed in the Henderson State University Herbarium were re-examined. *In situ* photographs were made of *L. caroliniana*. Field work was terminated in March of 1993 after winter conditions were examined. All vouchers collected during the study were deposited in the Henderson State University Herbarium.

Southern or Common Bog Clubmoss, *Lycopodiella appressa*, was found in all clubmoss communities examined, often as the predominant clubmoss present. Several local populations around ponds near Lake DeGray in Clark County were apparently pure stands of this species. Branching peduncles were often found in this species. Only simple branching is mentioned in published sources, but we found plants with up to seven branches. Two to four branches were most common. In several sites scattered plants were found with conspicuously twisted peduncles. These plants otherwise appeared as normal *L. appressa*. Twisting of peduncles seems to correlate with site conditions, since this has been observed only in plants growing up through dead tree branches or dense growths of grass. Strobilus length was quite variable within most populations, ranging from approximately 4 to 12 cm.

Foxtail Clubmoss, *Lycopodiella alopecuroides*, was found

in several local populations between Malvern and Traskwood in Saline and Hot Spring counties. One restricted population was found in Clark County. In one of the Saline County sites the peduncles were particularly large, one measuring 52 cm in height. All local populations observed were more restricted than that usually seen in *L. appressa*, but *L. alopecuroides* was the predominant clubmoss in two Saline County sites. *L.* x *copelandii* (*L. alopecuroides* x *appressa*), occuring in Saline and Clark Counties, was the only hybrid found thus far outside Calhoun County. An herbarium specimen collected from the Clark County site on October 15, 1986 (Watson 29), has a strobilus which forks near the middle, a condition which we have not seen elsewhere.

Creeping Foxtail Clubmoss, *Lycopodiella prostrata*, was found in one Saline County site with *L. appressa*. The smaller prostrate main stems were distinctive from those of nearby *L. alopecuroides* populations. Outside Calhoun County we have found only one site for *Lycopodiella prostrata* and have not yet positively identified its hybrids. We believe this probably represents lack of searching rather than lack of occurrence.

We were particularly gratified to find a relatively large population of Slender Clubmoss, *Lycopodiella caroliniana*, in Clark County north of Arkadelphia, since it seems to be very rare and threatened in Calhoun County. Although its abundance is not comparable with *L. appressa* in the same site, there were hundreds of individuals present, making it by far the largest population of *L. caroliniana* we have seen. The bog clubmoss community was dominated by *L. appressa*, but *L. caroliniana* was considerably more abundant than *L. alopecuroides* and *L.* x *copelandii*. One Slender Clubmoss plant was found with a branched peduncle.

The most common associates of the bog clubmosses found were *Xyris* species (*X. jubicai*, *X. iridifolia*, and perhaps others). This genus was found in virtually all sites. *Sphagnum* is often found in the wetter sites. *Drosera brevifolia* is a frequent associate in Calhoun, Hot Spring, and Saline Counties. Although this species occurs in Clark County, we have not yet seen it with clubmosses. During the winter the clubmoss peduncles died but often remained standing. Horizontal stems and their leaves remained mostly green.

Our study indicates a greater degree and frequency of peduncle branching than indicated in the literautre. Øllgaard (1992) described the peduncles in Section *Lycopodiella* as simple or up to twice-forked. Those of Section *Caroliniana* are described as simple. Bruce (1975) described the peduncle of *Lycopodiella caroliniana* as unbranched. Snyder and Bruce (1986) described the peduncles of all the bog clubmosses as unbranched. We have found nothing on branching of strobili.

We have learned that bog clubmoss communities in Arkansas previously thought to contain only *Lycopodiella appressa* often include one or more additional species. These sympatric occurrences in Clark, Hot Spring, and Saline Counties are comparable to that found in Calhoun County by Peck et al. (1987). Some sites examined in Clark County early in this study were thought to have extensive pure stands of *L. appressa*, but these should be searched more carefully. We now believe the sympatric occurrences of several bog clubmoss species described by Bruce (1975) are more likely overlooked than remarkable in southern Arkansas.

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