Proceedings of the Iowa Academy of Science

Volume 45 | Annual Issue Article 9

1938

The Fir Forests of Iowa

Henry S. Conard
Grinnell College

THE FIR FORESTS OF IOWA

HENRY S. CONARD

The occurrence of balsam fir (*Abies balsamea*) in Allamakee County was recorded by Macbride. He noted it as "Not rare. A fine grove on the hill above Yellow River, near Myron." In Winneshiek County it was recorded by Shimek. He considered it "Not rare, along rocky slopes and above ledges along the upper course of the Upper Iowa River. Most abundant near Kendallville and Bluffton." Several visits to these areas in the last five years enable us to report on present conditions and on certain other species of this region.

On the very steep slope of Galena-Platteville limestone opposite (south of) Bluffton there is a splendid grove of small slender balsams, extending a half-mile along the bluff. Recent droughts have killed a number of the trees, but the grove was still, in 1937, a beautiful sight. Station 1.

One mile west of this spot, in a deep bend of the river to the south, is a small group of balsams, five or six trees. We will designate this as station 2. The slope faces north and is moist and extremely steep. In places *Impatiens* makes exclusive stands.

Two miles down stream from Bluffton is another group of three or four balsams. Some have recently been cut at this station 3. The slopes are less steep and the moisture less.

Up river from Kendallville, adjacent to the settlement, is a steep slope, facing north, wooded, with abundant moisture. Here are a half dozen young balsams, evidently survivors of a grove mentioned by Shimek. The present specimens are about six feet tall. It is plain that conditions still permit seeding of the species. There has been some recent cutting of balsam. Station 4.

A half mile west of Plymouth Rock, up stream from the bridge, is another steep slope, facing north. One or two young balsams still live here, and a few dead ones were found. Station 5. We have not found balsam anywhere else in Winneshiek County.

The grove "near Myron," now known better as Old Stone House, six miles northeast of Postville, had several big (40 ft.) balsams in 1932. In 1936 the bigger ones had been cut, to no apparent purpose, exposing the choicest areas to more light and air

than is good for the boreal plants. In 1937 not one balsam was seen from the road. This station 6 is also a steep slope facing north, with ledges of limestone. Near by there are giant springs, from underground passages. All of these six stations are situated on the Galena-Platteville limestones, which are noted for their sinks, caves and big springs.

Associated with the balsams are several other boreal plants. *Taxus canadensis* is always present. In crevices of moist vertical rocks *Cryptogramma Stelleri* is found. Both of these plants, however, are found in many places where balsam does not now occur. *Cerastium velutinum* Raf. (*C. oblongifolium*) is confined to moist talus slopes near the balsams, where it is often abundant and showy. The fern-mosses are nearly always present with balsam fir.

Hylocomium splendens is known to us from only three places in Iowa: stations 1, 2 and 6. *Hypnum crista-castrensis* likewise is known from only three stations: 2, 6 and Pine Hollow in Dubuque County (Cf. Conard 1932). In the last station *Abies* is absent, but *Taxus canadensis* is abundant and luxuriant. *Bartramia Oederi* is known from stations 1, 2, 4, 6, Pine Hollow, two other stations in Winneshiek County, and from Muscatine County (Cavanagh 1932). *Oncophorus Wahlenbergii* is known only from stations 1 and 5, Pine Hollow, and Union Prairie Twp., Allamakee Co. *Drepanocladus uncinatus* has been detected only at station 6 and Pine Hollow. *Hypnum cupressiforme* (a small form) occurs with *Taxus* at stations 1 and 6. *Hypnum* (*Brotherella*) *recurvans* occurs at station 6 and Pine Hollow, and *Anomodon tristis* at station 2 and near Canoe in Winneshiek County.

Hylocomium (*Rhytidiadelphus*) *triquetrum* flourishes in the richest balsam groves, 1, 2, 6, and in Pine Hollow. It is also found on cool north slopes in Fayette, Hardin, Iowa and Madison Counties, one station each (Delaware, Johnson and Henry Counties. Savage 1898). *Calliergon Schreberi* is known from stations 2 and 6, Pine Hollow, two other stations in Winneshiek County, and from Emmet, Hardin, Jasper, Marion and Lee Counties, one station each (Henry and Johnson Counties. Savage 1898).

Two rock-mosses remain to be considered. On cool moist shaded rock-faces in Winneshiek, Allamakee, Clayton, Fayette and Dubuque Counties *Myurella Careyana* is to be expected, in scattering pale green julaceous threads among other mosses, or in little exclusive sods, up to six inches across. It is often in competition with a whitish powdery primitive lichen. We have it from stations 1, 2, 4, 5, 6, Pine Hollow, and five other stations.

A hint of the conditions of survival of these many boreal species is given by the occurrence of *Seligeria pusilla*. This minute moss spins a dark green velvety film over the faces of smooth blocks of limestone. The largest sheet I have seen in Iowa is four or five inches square. It grows by the square yard in the mountains south of Semmering in Austria. One must look parallel with the rock surface to see the millimeter tall setae — minute bristles indeed — standing strictly at right angles to the vertical substratum, each bearing a tiny urn of spores. In the third week of June the capsules are just mature, and are actually visible.

We have this rare moss from stations 1, 2, 4, 5 and six others, in Allamakee, Winneshiek, Fayette and Dubuque Counties. The search for it is facilitated by understanding its restricted habitat. We search by hand rather than by eye. Seeing a likely-looking cleft or hole in the rocks, we thrust in a hand. If we feel an ice-cold draft blowing out from under ground, we lie down and examine the sides of the cleft. Nearly always the rocks at the mouth of the cleft are velveted with *Seligeria*. A little farther out *Gymnostomum calcareum winonense* covers everything. Farther away — a few inches or a foot — the overhanging *Cryptogramma* and *Bartramia Oederi* and other plants are dripping with water condensed from the outside air by the cold blast from the rocks. In this constant-temperature chamber, then, *Seligeria* survives in Iowa.

The balsam groves that we have located are all situated on the notably cavernous Galena-Platteville limestone. In the airholes beneath the balsams *Seligeria* is at home. It seems safe to conclude that *Abies balsamea* and its associated plants also owe their survival to refrigeration of the soil by air and water from limestone caves.

On the rock summit of Panther Mountain in the Catskills near 4,000 ft. elevation *Abies balsamea* grows (or did grow in 1899) in pure stand in a dense carpet of *Hylocomium splendens*. The lowest and most southern grove of balsams that I have seen is in the Pocono Mts. of Pennsylvania, at an elevation of about 1,200 ft. The roots, set in a bed of boulders, were bathed with cold flowing spring water. Refrigeration of the roots is evidently a help to the survival of balsam fir in regions with a climate otherwise too warm and dry.

REFERENCES

CAVANAGH, L. Notes on Iowa Mosses V. Proc. Iowa Acad. Sci. 39: 53-55. 1932 (1934).

CONARD, H. S. Mosses of Pine Hollow. Bryologist 35: 28-30. 1932.
CRAIGG, E. J. (MRS. W.). Mosses of Allamakee County, Iowa. Master's thesis, Grinnell College. 1933.
MACBRIDE, T. H. Forest trees of Allamakee County, Iowa. Iowa Geol. Surv. 4: 112-120. 1894 (1895).
SAVAGE, T. E. A preliminary list of the Mosses of Iowa. Proc. Iowa Acad. Sci. 6: 154-164. 1898 (1899).
SHIMEK, B. Flora of Winneshiek County. Iowa Geol. Surv. 16: 165. 1905 (1906).

GRINNELL COLLEGE,
GRINNELL, IOWA.