A NOTE ON THE NODAL ANATOMY OF *ANKYROPTERIS GLABRA* BAXTER

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Considerable interest has been centered in the Carboniferous genus *Ankyropteris* since it presents, so far as I am aware, the earliest known instance of axillary branching. A comprehensive understanding of the genus may be gained from the works of Scott (1912), Holden (1930), Read (1938), Baxter (1951) and others cited in these papers. It is the purpose of this note to supplement the description of *A. glabra* Baxter (1951) with particular reference to the nodal anatomy.

The specimen of *A. glabra* described here was found in the same collection of coal balls from which Baxter obtained the type specimen,—the Indiana No. 5 coal about 10 miles north of Booneville, Indiana. This species was delimited from previously described species of *Ankyropteris* on the basis of the lack of multicellular hairs and the origin of the axillary branch from the stem above the point of departure of the leaf trace. When compared with conceivably related species I believe the difference is actually more clear cut. In *A. grayi* Scott, for example, the stele is much more angular, the central mixed pith is more conspicuous, and the trace at the point of departure from the stem stele is triangular, being quite in contrast to the more or less round (in transverse section) trace of *A. glabra*. Similar differences clearly delimit *A. glabra* from *A. corrugata* (Holden, 1930).

On the basis of the type specimen Baxter pointed out that in *A. glabra* the petiole (phyllophore) trace departs from the stem before the axillary stele, the latter remaining attached to the stem stele for another centimeter. In contrast to this, in *A. grayi* a single triangular trace departs from the stem stele and then divides into two, one trace becoming differentiated into the petiole trace and the other into the axillary branch trace.

The specimen under consideration consists of a stem about 12 cm. long bearing the basal portion of two petioles and associated branches. The internodal distance is 7 cm., corresponding to that cited for the type specimen. Since the anatomy of the two nodes differs somewhat from each other as well as from the type specimen it may be convenient to consider them separately.

Node 1.—The node is identified by the departure from the stem stele of a strand or "common trace" (pl. 11, figs. 1, 2) that is of essentially the same organization as the stem stele itself, differing only in its smaller size. It is not until this is distinctly separate (fig. 3) that it shows evidence of differentiating into a leaf trace and an axillary branch stele. In fig. 4 the two are separate, the leaf trace being a slender, tangentially elongated strand and the axillary branch trace being more or less circular in transverse section. The leaf trace next divides into two essentially equal strands one of which passes off to the right, as shown in fig. 5,

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and the other presumably develops into the main petiole strand, although preservation beyond this point is very poor. The significance of this early division of the petiole trace is not clear. It may possibly be interpreted as a dichotomy of the rachis, as is known in certain of the sphenopterid fronds and in *Telangium affine*.

Node 2.—The departure of the common trace at first follows the same pattern described above; that is, it separates from the stem stele *and then* becomes differentiated into an axillary branch stele and petiole trace (fig. 6). The latter, starting as a tangentially elongated bar, develops into the characteristic H-shaped *Ankyropteris* leaf (phyllophore) trace (fig. 7).

It is then apparent that the xylary nodal structure presented by this specimen compares more closely with that described for *A. grayi* Scott than for *A. glabra* Baxter. Since the specimen described here was obtained from the same coal ball collection from which Baxter obtained *A. glabra* and the two compare closely in every other way, there was apparently a certain degree of variation in the nodal anatomy. Since this difference, although of considerable anatomical interest, is not sufficient to warrant a distinct specific entity, it seems desirable to emend Baxter's specific diagnosis:

ANKYROPTERIS GLABRA Baxter, emend. Andrews.

Stem oval in transverse section, approximately 14 × 9 mm.; stele 5-lobed, consisting of very narrow discontinuous rays of small tracheidal cells surrounded by much larger tracheids. Cortex a narrow inner zone of thick-walled cells and a broad outer zone of thin-walled parenchyma; aphlebiae numerous; surface of plant glabrous. Petiole (phyllophore) trace of the *di-upsilon* type. Axillary branch stele arising either from the stem above the point of departure of the petiole trace or from the division of a common trace.

Origin: Identical with that cited for the type specimen by Baxter (1951, p. 440).

Literature Cited:—

Baxter, Robert W. (1951). *Ankyropteris glabra*, a new American species of the Zygopteridaceae. Amer. Jour. Bot. 38:440–452.

Holden, H. S. (1930). On the structure and affinities of *Ankyropteris corrugata*. Phil. Trans. Roy. Soc. Lond. 218B:79–114.

Read, C. B. (1938). A new fern from the Johns Valley shale of Oklahoma. Amer. Jour. Bot. 25: 335–338.

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EXPLANATION OF PLATE 11

Ankyropteris glabra Baxter

Figs. 1–5. Stages in the departure of a petiole trace and axillary branch in Node 1. Fig. 6. Stem stele, branch stele, and trace of Node 2. Fig. 7. Petiole trace at a slightly higher level than shown in fig. 6. Peel preparations as follows: fig. 1, 888 B-t16; fig. 2, B-t4; fig. 3, C-b2; fig. 4, C-b6; fig. 5, C-b10; fig. 6, G-b6; fig. 7, G-b13.