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# ON A NEW SPECIES OF *ANNULARIA* FROM NEW SOUTH WALES.

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(Plate viii.)

*Annularia Ivisi*, n. sp.

Stem slender, articulate; leaf-whorls and stem approximately in the same plane; whorls consisting of about thirty leaves, each leaf being joined to the neighbouring ones for half or more of its length. Leaves narrow, wedge-shaped and straight, greatest width near apex, which is obtusely rounded and prolonged into a mucro; traversed by a single prominent vein.

In the specimen there are remains of several leaf-whorls, two of which (Pl. viii, fig. 1) are adjacent whorls, with portion of the stem joining them preserved. This stem is about 1.5 mm. broad and the internode is about 2.5 cm. in length. The leaf whorl forms an almost continuous lamina, roughly circular in outline, adjacent whorls overlapping slightly; the leaves are joined for a little more than half their length, and are quite close together for the remainder. There are about thirty leaves in a whorl, the individual leaf being narrow, wedge-shaped and straight, about 15 mm. long and about 2 mm. wide at the widest part, which is some 2 mm. from the apex. Each leaf has a distinct midrib which shows as a very fine projecting line in the specimen. This fine line is usually in the middle of a narrow dark band some quarter of a millimetre wide, often widening slightly towards the apex of the leaf. In the few cases in which the apex of the leaf is preserved there is distinct indication of its prolongation as a mucro (Pl. viii, fig. 2), as in the specimens figured by Walton (1936, pls. 31, 32). There are a number of irregular markings diverging from the midrib (Pl. viii, figs. 3, 4), which possibly represent the markings on the leaf surface mentioned by Halle (1928, p. 239, pl. i, fig. 9) as being present on the adaxial side of leaves of *Annularia sphenophylloides*—the side of the leaf which, he suggested, faced upwards. Halle regarded these as representing hairs on the leaf surface, but Walton (1936, p. 231) considers them to be due to the presence of a "system of elongated darker structures of cellular dimensions" in the substance of the lamina. The appearance of the leaf impression in our specimen is very like that figured by Walton for *Annularia Jongmansii* (1936, pl. 31, figs. 12, 13).

The leaf whorl appears to be complete; there does not seem to be any gap either apically or basally. There is no marked difference in the lengths of leaves in a single whorl such as occurs in some species of *Annularia*, and which is characteristic of *Lobatannularia*.

The equality in length of the leaves and their linear character, and the absence of gaps in the whorl clearly differentiate the specimen from the genus *Lobatannularia* Kawasaki, and it seems reasonable to place it in *Annularia*. In general appearance and in size and disposition of the leaves it resembles *A. stellata*, but the fact that the leaves are joined for the greater part of their length in the portions of all the (five) whorls preserved, together with the appearance caused by the dark cell contents in the lamina, is perhaps sufficient to justify its separation as a distinct species.

*Locality*: Near the northern end of the Burning Mountain, about half a mile from Murulla Siding, which is 211 miles from Sydney by rail.

*Horizon*: Permian: Greta Coal Measures.

*Type*: Specimen No. F.39534 in the collection of the Australian Museum, Sydney. Collected by Mr. C. J. Ivison of Murrurundi, after whom the species is named.

I am indebted to Mr. C. A. Süßmilch for the opportunity of examining this interesting specimen.

Our specimen is clearly distinct from the plant described and figured by Etheridge (1895) as allied to *Phyllothea* and *Cingularia*, which was later described by Arber (1905, p. 26) as *Phyllothea Etheridgei*.

The specimen consists of a series of impressions of leaf whorls, preserved in a fine-grained, light coloured mudstone. Associated with these there are leaf fragments of *Glossopteris* (*G. Browniana* type) and articulate stem fragments (? *Phyllothea australis*).

The only specimen previously described from Australia which at all resembles the present one is that described as *Annularia stellata* (?) from near Dunedoo, N.S.W. (Walkom, 1916). This shows distinct inequality in the lengths of leaves in a whorl, the leaves are separate for practically the whole of their length and are somewhat falcate in shape, being curved towards the apex of the shoot. Kawasaki (1927, p. 13) suggests that this belongs to his genus *Lobatannularia*, a suggestion with which we may agree. He refers it to his *L. inequifolia*, but perhaps it agrees better with Halle's (1927, p. 28) species *sinensis*, description of which was published very shortly after the appearance of Kawasaki's paper.

Whitehouse (1933, p. 38) has mentioned the occurrence of *Lobatannularia* in Queensland, but no description or illustration was published.

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#### EXPLANATION OF PLATE VIII.

##### *Annularia Ivini*, n. sp.

Fig. 1.—Specimen showing two adjacent leaf whorls, and portion of another. Approx. natural size.

Fig. 2.—Lower whorl of Figure 1, showing tendency to prolongation of leaves as a mucro. Approx. natural size.

Figs. 3, 4.—Portions of whorls showing the markings diverging from midribs of leaves. Figure 3,  $\times 5.5$ ; Figure 4,  $\times 6$ .

All figures from specimen F.39534, Australian Museum Coll.

Figures 1, 3, 4 from photographs by G. C. Clutton.

