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## NEW MATERIAL OF *LEPIDODENDRON*-LIKE PLANTS FROM THE WUTUNG SERIES OF KIANGSU

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### (Summary)

Recently, on examining the specimens kept in the Geological Department of Nanking University, the writer has found some new *Lepidodendron*-like plants which deserve special notice. The purpose of this paper is to mention and illustrate two interesting species.

### DESCRIPTION OF SPECIES

#### *Lepidodendropsis scobiniiformis* (Meek) Read

(Pl. I, fig. 1)

1955, Read, *Lepidodendropsis scobiniiformis*, Geol. Surv. Prof. p. 26; Pl. XIX, figs. 3—5; Pl. XX, figs. 1—3.

The species is represented by some stem-fragments. The most well preserved specimen is figured in Pl. I, figs. 1, 1a. The impression of the flattened stem is measured 5.5—6.0 mm in breadth and 138 mm in length. They are covered with very small and delicate leaf cushions. The cushions are elongate-obovate, the upper portion being obtuse and the lower portion tapering gradually to a point. The whole cushion is 2.2—2.5 mm in length, attaining 0.6 mm in its maximum breadth, and the common ratio of the length to the breadth of a cushion is about 3.7—4.1:1. The cushions are closely set, with contiguous margins and separated by very narrow strips. The horizontal distance between the adjacent cushions on each verticil is about 0.1—0.2 mm, far less than the breadth of the cushion. The cushions appear to be verticillate in arrangement, and those in adjacent verticils alternate with each other. Both Banks (1944) and Sze (1960) have expressed the opinion that the type of this arrangement may be really considered to be in tight spirals or pseudoverticilles. They are also arranged rather uniformly and there is no difference in size among them. A distinct keel dividing the cushion in two halves, has a length nearly the same as that of the cushion. There is a notch below the uppermost extremity of the cushion on each one, which represents probably trace of leaf scar. On the margin of the stem many undivided narrow, linear and almost filiform leaves attaching nearly to the upper extremity of the cushions are preserved. The leaf is measured only 0.5 mm in breadth and 15 mm in its maximum length; it is marked with a single median vein, and is slightly spread and decurrent at the base. All the leaves arise first at angles of about 70°—80° to the stem, then slightly curve upwards and inwards.

The present specimens resemble closely *Lepidodendropsis scobiniiformis* (Meek) described by Read (1955, Pl. XIX, figs. 3—5; Pl. XX, figs. 1—3) from the Lower Carboniferous Pocono Formation of North America almost in every respects. It shows also a resemblance to the specimen from the Wutung Series of Kiangsu figured by Sze (1956, Pl. I, fig. 2) as *Lepidodendropsis hirmeri* Lutz. But, comparing the present specimens with the genotype *L. hirmeri* Lutz (1933, Pl. XV, figs. 1—12; Pl. XVI, figs. 1—10), the writer finds some obvious difference between them. Lutz's specimens with elongate-hexagonal or narrowly fusiform cushions have four distinct longitudinal lines on the narrow part of the surface between the cushions, and a furrow to connect the cushions arranged in vertical rows; while the present specimens have uniform cushions in size. It is evident that our form, however, is not specifically identical with Lutz's. A similar opinion has been expressed by Read that *L. scobiniiformis* is evidently identical with the specimens described by Jongmans, Gothan and Darrah (1937, p. 431—434) as *L. hirmeri* Lutz (Read, 1955, p. 27). Thus, there comes up the question of treatment of a named American species which may be synonymous with an European form. But Read did not reach the conclusion that the American species is really identical with Lutz's genotype. Read (p. 27) said: "The continued use of both names will serve a useful purpose, however, if each is restricted to the continent from which it was originally described". He pointed out further that even *L. hirmeri* and *L. scobiniiformis* will be proved to be specifically identical, the name *L. scobiniiformis* must be retained and *L. hirmeri* will become the synonym. The writer is in complete agreement with his views, and our specimens has been referred, with considerable hesitation, to *L. scobiniiformis* (Meek) Read.

**Horizon and locality:** The upper part of the Wutung Series; Lungt'an, some 20 Km southeast of Nanking, Kiangsu.

### ***Leptophloeum suzhouense* Chang (sp. nov.)**

(Pl. I, figs. 2—3)

Leaf cushions, in rather low relief, transversely rhombic, about two times as wide (14—15 mm) as high (6—7 mm), with acute and elongated lateral angles, rather deep broadly rounded lower borders and slightly curved inwards upper borders, touching or tapering gradually to an obtuse angle; otherwise they are arranged in spiral, and separated by narrow bands of unequal thickness, usually 0.6—1.2 mm broad. The outline of the cushions shows a more or less "*Spirifer*"-like appearance. Leaf scars, comparatively large (about 4—5 mm high and 2—2.5 mm wide), egg-shaped, occupying  $2/3$ — $4/5$  the length of the whole cushions. At the upper end of the leaf scar a small punctate representing the vascular bundle can distinctly be seen.

The material on which this species was founded consists of two well preserved specimens, measuring about 50 mm in breadth. The specimen in Pl. I, figs. 3, 3a, appears to have a distinct vascular scar at the upper end of the leaf scar, but the outline of cushions is very indistinct.

The genus *Leptophloeum* was established by Dawson in 1861, hitherto including only two forms, namely, *L. rhombicum* Dawson and *L. australe* (M'Coy). The former is the type of the genus, while the latter was first instituted by M'Coy in 1874 under the name *Lepidodendron australe* from the Lower Carboniferous of Victoria, Australia (see Seward, 1907, p. 486; 1910, p. 180), and was later referred to *Leptophloeum*. The relation be-

tween these two forms is not yet quite clear, although Prof. Sze (1952) expressed a definite opinion that the species *L. australe* might be conspecific with *L. rhombicum*. However, our species differs from these two forms in having the “*Spirifer*”-like outline of the cushions and comparatively large leaf scars. Another distinction may be noted is that the common ratio of the width to the height of a cushion of *L. rhombicum* and *L. australe* is usually smaller than that of our form. The present material appears to be sufficient to serve as a new specific type, *L. suzhouense* Chang.

In connection herewith it should be pointed out that the difference between the present species and *Leptophloeum sibiricum* Krysht. (1927) from Siberia is very significant. The Siberian species has subsequently been transferred to the genus *Blasaria* Zalesky.

**Horizon and locality:** The Wutung Series; Mituoshan, near Suzhou, Kiangsu.

Here, the writer wishes to express the indebtedness to Prof. H. H. Lee for his cordial encouragement and critical reading of the manuscript.

## 图 版 说 明

图版内所有图影未加任何润饰,标本均保存在南京大学地质系古生物地史教研室。

### 图 版 I

图 1. *Lepidodendropsis scobiniiformis* (Meek) Read,  $\times 1.5$ 。

1a. 一部分,放大  $\times 2.5$ , 示叶座表面的细部构造。登记号码: B6301。

图 2—3. *Leptophloeum suzhouense* Chang (新种),  $\times 1$ 。

2a. 图 2 的放大,  $\times 2$ 。登记号码: B6401 (模式标本)。

3a. 图 3 的一部分,  $\times 2.5$ , 示叶痕及其上端的输导束痕。登记号码: B6402。

### Explanation of Plate

All figures are unretouched photographs. The specimens described in this paper are kept in the museum of the Geological Department of Nanking University.

### Plant I

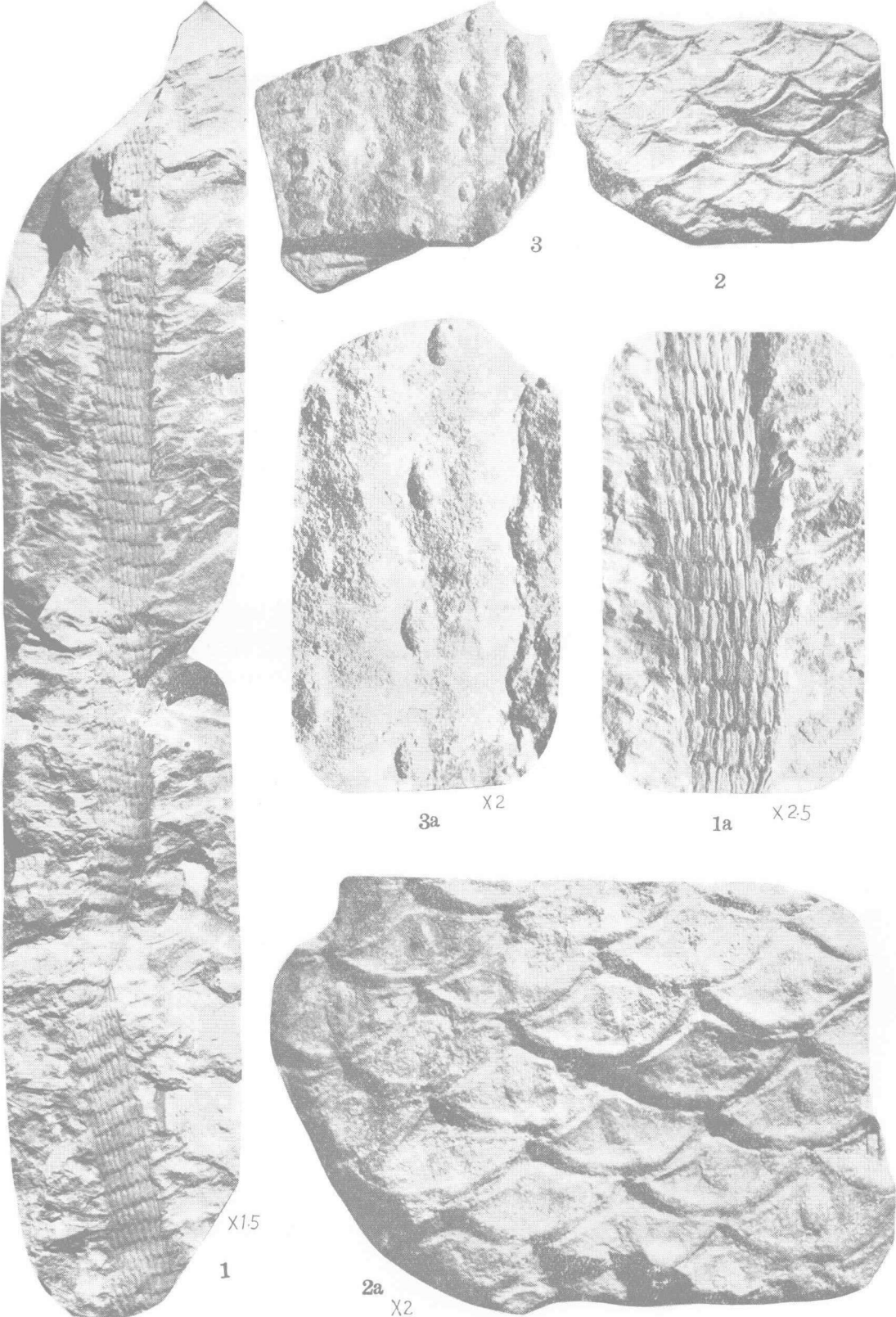
Fig. 1. *Lepidodendropsis scobiniiformis* (Meek) Read,  $\times 1.5$ .

1a. Part of the specimen,  $\times 2.5$ , showing surface sculptures of the cushions. Cat. No. B6301.

Figs. 2—3. *Leptophloeum suzhouense* Chang (sp. nov.),  $\times 1$ .

2a. the same as fig. 2,  $\times 2$ . Cat. No. B6401. (Type specimen).

3a. part of the specimen in fig. 3,  $\times 2.5$ , showing the vascular scars at the upper end of the leaf scars. Cat. No. B6402.



座长度的  $2/3-4/5$ 。叶痕的上端有一代表维管束的圆形印痕。

当前标本共有两块,保存的宽度约为 50 毫米,均产于灰白色细砂岩中。表示于图版 I, 图 3 和 3a 的一块,虽然叶座的轮廓已不甚清楚,但叶痕及其上端的输导束痕保存得特别完好。

**讨论与比较:** 自从 Dawson (1861) 建立 *Leptophloeum* 属以来,已有一百多年的研究历史,但迄今为止,一般认为这一个属只包括两个种。除了产于美国 Maine 州晚泥盆世 Perry 层的属型种 *L. rhombicum* Dawson 外,另一个便是 *L. australe* (M'Coy)。后者建立于 1874 年,标本发现于澳大利亚的 Victoria 州,也有名之为 *Lepidodendron australe* M'Coy, 或者等于 *Lepidodendron nothum* Unger 的(见 Seward, 1907, 第 484—486 页; 1910, 第 180 页)。从这两个种的模式标本的图影来看,它们的区别在于属型种叶痕位于叶座的正中,而澳大利亚种的叶痕则在叶座中央的上端,例如,日本橘行一就是这样看待的(见斯行健, 1952, 第 4 页)。此外,在叶座形状方面,属型种通常是宽度大于长度,而澳大利亚种则常常是长度大于宽度的。但是不少学者仍主张将澳大利亚种合并于 *L. rhombicum* Dawson 之内,如斯行健(1952)即是,他对此曾作过详细的讨论。尽管关于这两个种合并抑或独立的问题尚有争论,但并不妨碍当前标本作为新种的提出。因为这两个种都是以斜方形或微带六边形的叶座和细小的叶痕作为它们的共同特征的。而新种的叶座形状较为独特,作“石燕”状,叶座内的叶痕也甚大。而且上述两个种叶座宽度与长度之比,通常是小于新种的。根据这些特征,新种是很容易与这一属的已知种相区别的。当前标本是否有可能建立新属的问题,待将来发现更多材料后,不是不可以考虑的。

至于 Криштофович (1927) 根据发现于苏联西伯利亚上泥盆统的标本而建立的 *Lep-  
tophloeum sibiricum* Krysht, 与当前标本区别甚大。同时,这一个西伯利亚种后来已改归  
于 Zalessky 的新属,而名为 *Blasaria sibirica*, 这里就不多加讨论了。

**产地及层位:** 江苏苏州光福密陀山;五通群。

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