

晉北大同煤系的一塊類似 *Phyllocladopsis* 的化石*

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(附1圖版)

本文所討論的一塊化石是北京地質學院楊遵儀教授送來鑑定的。這塊化石是張席禔、楊遵儀兩教授以及前清華大學地學系學生在1949年所採集的。化石發現於山西北部大同附近的大同煤系，其時代屬於下侏羅紀。根據葉的形態以及葉脈的型式，並且根據枝部的不規則地分叉的狀態，當前的標本幾乎和北美下白堊紀初期的Potomac層中所發現的*Phyllocladopsis heterophylla* Fontaine (1889, 第204頁, 圖版XXXIV, 圖5; 圖版CLXVI, 圖4)是完全相一致的。Fontaine 1889年所給的關於這一個種的特徵，特重述於下：

“着生葉的枝部分叉次數很多，並且是不規則地分叉的；葉頗小，對生，頗厚，在同一枝上葉的體積頗有變異，其形態亦有頗有變異，寬卵形，寬的橢圓形以及圓球形，其基部最寬，突然地收縮而為一個短的、微微地扭轉的小柄，葉的頂端由鈍圓至半尖形。枝部頂端的葉其形態和體積和其餘的葉相同。葉脈普通不甚明顯，埋入厚的葉膜之內，脈作扇狀脈，從葉的基部放射出去，分叉一次或二次。”

上述的種的特徵，似乎完全可以應用於當前的標本上。不過Fontaine在“種的特徵”上說明葉是對生的，但我們視察他的原圖，覺得至少有一部分葉是作互生狀態的（看本文的圖2）。在我們的標本上，葉多半是作互生狀態的（參看本文的圖1）。根據Fontaine，這一個種在Potomac植物羣中是非常稀少的，一直到現在僅發現了一個種。在中國北部的下侏羅紀大同煤系的發現類似的化石頗具重要意義，因為這一個發現不但可以表示這一個稀有的植物的地理上的寬的分佈，而且也可以表示其他層上直的分佈也是很長的。這一個種似可分佈於自下侏羅紀的下部直至下白堊紀的初

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期。根據 Fontaine, 這一種植物的形態和地位都很難完全決定, 因為找到的材料太少了; 但此種植物和現代的一屬松柏植物如 *Phyllocladus* 有好多點是頗相近似的。屬名 *Phyllocladopsis* 的創立是暫時性的, 這一個名詞的含意, 就是和 *Phyllocladus* 相近似的植物(希臘文的字尾 *opsis* 是相似之意)。Seward 似乎承認此種植物是屬於松柏科的, 因為他在“Fossil Plants”一書第 IV 卷(1919)中, 在討論和敘述松柏科化石的一章中叙及到這一個種。他進一步指出, 這一個種的“種型” *Phyllocladopsis heterophylla* 是和北美同一地層所發現的另一屬化石 *Nageiopsis* 是很相近似的; 並且這一個種, 其葉部的性質並不足以證明其和現代的 *Phyllocladus* 有形態上的親緣關係的。(1919, 第 417 頁)。根據 Seward, 這一個種的植物學上的地位, 暫時最好不要加以決定。他再特別指出(1919, 第 417 頁): “如果我們將這一種化石定其屬名為 *Nageiopsis*, 似乎還要妥當些, 至少要比用一類其含義和別種植物有關係而實在的關係尚未曾建立的屬名要好得多。”本文作者却和 Fontaine 的意見相同, 即 *Phyllocladopsis heterophylla* 的確有些像 *Nageiopsis*, 但葉脈的形態是不相同的。和 *Nageiopsis* 的許多“種”不相同, *Phyllocladopsis heterophylla* 的葉是小得多, 並且是作寬卵形的, 而且其葉脈的向兩側擴張也較甚於 *Nageiopsis*。因此這一個種是不適宜放置在 *Nageiopsis* 的屬名之下的。講到此處, 我們應該指出: 就是 Seward 所贊成的 *Nageiopsis* 也不是一個很完美的屬名, 因為這些被定為 *Nageiopsis* 的植物和現代的羅漢松的一屬 *Nageio*, 也僅僅是表面上的相似, 並無真正的直接關係的。Seward 自己也曾相信(1912, 第 33 頁; 1919, 第 457 頁), 有些被定為 *Nageiopsis* 的枝部化石, 實際上是屬於南洋杉的, 它們的全形態, 極似一種南洋杉即 *Araucaria bidwilli* 並且和南洋杉科的另一屬即 *Agathis* 也極相近似的。Seward 自己也並且說過: “在沒有發現了生殖部分的化石以前, 我們想來正確地決定 *Nageiopsis* 一屬化石的植物學上的地位, 是根本不可能的。”(Seward, 1919, 第 457 頁)。

Phyllocladopsis 不過是一個“形態屬名”, 這一個屬名, 根據含義是和現代植物 *Phyllocladus* 是相似的, 兩者的真正的關係並未曾建立的。而 Seward 所贊成的 *Nageiopsis* 也不過是一個“形態屬名”, 它和現代的 *Nageio* 的關係, 也並未真正建立。這兩個名詞即 *Phyllocladopsis* 及 *Nageiopsis* 的價值是完全相等的。在古植物學文獻中, 還有不少同樣的“形態屬名”(Form-genera) 甚至也有若干“天然的屬名”(Nature-genera) 如 *Protoblechnum* 之於 *Blechnum*, *Palaeoweichselia* 之於 *Weichselia*, *Noeggerathiopsis* 之於 *Noeggerathia* 甚至如 *Protolapidodendron* 之於 *Lepidoden-*

dron……等等這些屬名的含義都和另一屬名表示有相當的關係，而其實這些關係確實地已經證明是不存在的。這些屬名的“合法性”却始終未被古植物學家懷疑過。因為優先例及便利起見，本文作者在這一篇論文中暫時保留 *Phyllocladopsis* 這一個名詞。

晉北大同煤系的一塊標本，葉的體積似微大於北美 Potomac 植物羣的化石，但這一個區別似不夠保證作為分種的理由的。作者暫定當前的標本為 *Phyllocladopsis* cf. *heterophylla* Fontaine (? n. sp.)。因為便於比較起見，北美種的一部分重新登載於此(本文圖 2)。當前的化石是保存在一種白灰色砂岩中。葉的印痕上面未曾保存着炭質薄膜，不能利用“浸解方法”研究其表皮構造。因此對於這一個種的表皮構造及小氣孔的構造，我們尚未能明白，而表皮及氣孔的構造，對於鑑定松柏類化石是異常重要的。

文 獻 參 考

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ON A *PHYLLOCLADOPSIS*-LIKE REMAIN OF THE TATUNG COAL SERIES, NORTHERN SHANSI.

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The specimen on which this paper is based was sent to me by T. Y. Yang, Professor of Palaeontology of the Geological College, Peking. It was collected in 1949 by Profs. H. C. Chang, T. Y. Yang and many students of the Geological Department of the former National Tsinghua University from the Tatung Coal Series, Northern Shansi. In regard to the shape of the leaves and the pattern of venation and in regard to the irregularly branched foliage-shoots, the present specimen is identical almost in all respects with the remarkable species *Phyllocladopsis heterophylla* Fontaine (1889, p.204, Pl.LXXXIV, fig.5; Pl.CLXVI, fig.4) from the Potomac Formation of North America. The original diagnosis given by Fontaine in 1889 for this species may be reprinted below:

"Leafy stems branching copiousl yand irregularly; leaves small, opposite, very thick, of varying sizes on the same branch, varying a good deal in shape, broadly ovate, broadly elliptical or orbicular, broadest at base, abruptly narrowed into a short slightly twisted pedicel, obtuse to subacute, terminal leaflet of the twigs like those lower down; nerves usually not distinct, being immersed in the thick leaf-substance, radiating palmatel from a common point at base, and forking once or twice."

This diagnosis can fairly well be applied for the present specimen. This genus is quite rare in the Potomac flora, and as yet shows only one species. The discovery of the present specimen from the Tatung Coal Series of Northern China is thus a matter of importance, for it indicates not only a wide geographical distribution, but also a great stratigraphical range of this species. The species may occur from the Lower Jurassic to the Lower Cretaceous. According to Fontaine, the character and place of this form cannot be fixed positively from the small amount of material found, but it is strikingly like the recent coniferous genus *Phyllocladus* in many respects. The generic name *Phyllocladopsis* is thus provisionally formed and named from the resemblance to *Phyllocladus*. Prof. Seward

seemed to admit that the species may belong to a conifer, for he mentioned this species on page 417 of "Fossil Plants" Vol. IV(1919) dealing with the chapter of the coniferales. He further remarked that the type-species *Phyllocladopsis heterophylla* bears a close resemblance to some forms of *Nageiopsis* and there can be no doubt as to the foliar nature of the appendages, which afford no evidence of morphological affinity to the Phylloclades of a *Phyllocladus*. According to Seward (1919, p.417), the species must be left for the present as a plant of uncertain position. Seward further pointed out that it would seem more appropriate to adopt the generic name *Nageiopsis* than to make use of a designation suggesting a relationship which has not been established. The present writer is quite prepared to agree with Prof. Fontaine that the species *Phyllocladopsis heterophylla* resembles indeed *Nageiopsis* in some features but the leave-veins have a different character. The species *Phyllocladopsis heterophylla* is characterized, unlike many species of *Nageiopsis*, by more small broadly ovate leaves with more spreading veins. This species can not therefore be appropriately placed in the genus *Nageiopsis*. In this connection, it should be pointed out that even the generic name *Nageiopsis* is also a very unfortunate one, because the plant has really no direct relation, but only a superficial resemblance to the recent coniferous shoots of *Podocarpus* belonging to the section *Nageia*. And Seward himself was of the opinion that some of the shoots referred to *Nageiopsis* may be Araucarian, as in habit they closely resemble *Araucaria bidwilli* and *Agathis* and that until reproductive organs are discovered, it is impossible to speak with confidence with regard to the position of the genus (Seward 1919, p.457).

The name *Phyllocladopsis* represents only a form-genus; it suggests a relationship with the recent genus *Phyllocladus* which has not yet actually been established. And in the palaeobotanic literatures, there are many similar form-genera and even nature-genera, like *Protoblechnum* to *Blechnum*, *Palaeoweichselia* to *Weichselia*, *Noeggerathiopsis* to *Noeggerathia* and *Protolpidodendron* to *Lepidodendron*, etc. suggesting a relationship with another genera which certainly does not exist. The validity of these form-genera have not been doubted by many palaeobotanists. The present writer therefore keeps the name *Phyllocladopsis* for the time being only on the ground of priority and convenience.

The leaves or leaflets of our specimen may be comparatively a little bit larger than those of the American species, but this difference is hardly sufficient to warrant

specific separation of the two forms. Our specimen may be determined for the present as *Phyllocladopsis* cf. *hererophylla* Fontaine (? sp. nov.). For the purpose of comparison, a part of the American species is refigured in the present paper (fig. 2). Our species is preserved on a matrix of white-grayish sandstone. The impression of the leaves is covered with no substance of carbonaceous films which could be examined microscopically. The stomata and the epidermal structures of our species are therefore unknown.

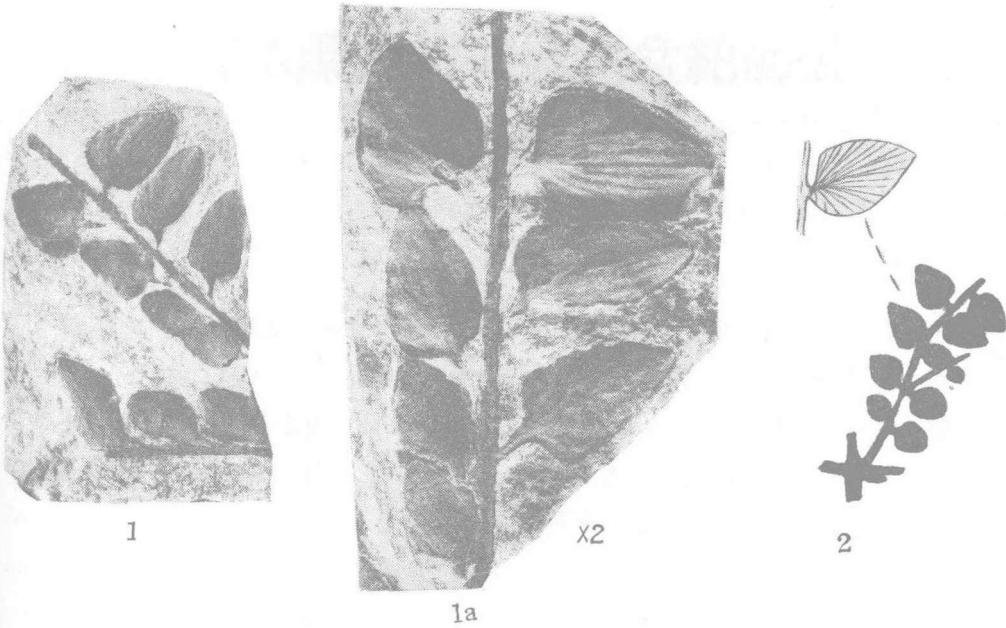


圖 1, 1a *Phyllocladopsis cf. heterophylla* Fontaine (? n.sp.) 圖 1, 原大; 圖 1a 放大×2。

地點：山西大同西南口泉鎮西北的永定莊南電廠邊。

地層：下侏羅紀的大同煤系。（登記號碼 *PB 2212*）

圖 2 *Phyllocladopsis heterophylla* Fontaine（原大）

發現於北美下白堊紀 Potomac 層。