

# A note on the geographic and stratigraphic distribution of *Jurinodendron* in China

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## ABSTRACT

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*Cyclostigma*. Haughton ex. Heer 1871, which is a homonym of modern botany, should be abandoned. Doweld proposed *Jurinodendron* Doweld to replace it. This paper shows the geographic and stratigraphic distribution of *Jurinodendron* in P.R. China, which adds to the current knowledge of the distribution of *Jurinodendron* Doweld and its significance as a cosmopolitan taxon.

**Key-words**—*Jurinodendron*, homonym, geographic and stratigraphic distribution, P.R. China.

## चीन में जूरीनोडेन्ड्रॉन के भौगोलिक तथा स्तरिक वितरण पर एक टिप्पणी

झुओ फेंग, पिंग ली, गुआंगलॉंग शेन एवं जें वांग

सारांश

डोवेल्ड ने प्रस्तावित किया कि साइक्लोस्टिग्मा हॉटन उपरान्त हीर 1871 का त्याग कर इसके स्थान पर आधुनिक जूरीनोडेन्ड्रॉन डोवेल्ड रखा जाना चाहिए। यह शोध-पत्र चीन में जूरीनोडेन्ड्रॉन का भौगोलिक तथा स्तरिक वितरण प्रदर्शित करता है जो कि जूरीनोडेन्ड्रॉन डोवेल्ड के वितरण में वर्तमान ज्ञान को बढ़ाता है और इसका महत्व विश्वजनीन वर्गक के रूप में है।

**संकेत शब्द**—जूरीनोडेन्ड्रॉन, समनाम, भौगोलिक एवं स्तरिक वितरण, चीन।

## INTRODUCTION

**D**URING the study of nomenclature of fossil plants, the Russian palaeobotanist Doweld (2001) found that the generic name *Cyclostigma*, for the widely spread *Lepidodendron*-like fossil remains of the late Devonian, was a homonym of several modern plant taxa *Cyclostigma* Hochstetter ex Endlicher, 1842 (Apocynaceae Juss.), *Cyclostigma* Klotzsch, 1853 (Euphorbiaceae Juss.), and

*Cyclostigma* Philippi, 1870 (Solanaceae Juss.). In accordance with the rules of the International Code of Botanical Nomenclature (ICBN), Doweld proposed a new generic name, *Jurinodendron*, to replace the palaeobotanical application of *Cyclostigma*. He further summed up the geographic and stratigraphic distribution of all the known species of this genus. However, there was no reference quote from Chinese material in Doweld's publication of the cosmopolitan *Jurinodendron* Doweld, 2001.

The genus *Cyclostigma* was first used by Houghton (1860 a, b, c) to describe certain *Lepidodendron*-like fossil plants from Kiltoran Hill, County Kilkenny and elsewhere in the Upper Old Sandstone of Ireland. Nonetheless, Houghton did not follow the requirements of the ICBN to validate this new generic name. Heer (1871) was the first author who attended all the requirements for the valid publication of the new generic name for lepidodendrophytes. Hereafter, *Cyclostigma* was recommended by several palaeobotanical masters (Schimper, 1874; Kidston, 1886). Further study and examination of the systematic position and relationship of the genus *Cyclostigma* to certain other groups is somewhat problematic. Since more and more fossils were collected from different localities and with different degree of preservation, many palaeobotanists (Weiss & Sterzel, 1893; Kidston, 1903; Seward, 1910; Jongmans, 1913; Gothan, 1923; Hirmer, 1927; Crookall, 1939) referred to *Cyclostigma* as *Pinakodendron* Weiss, while Nathorst (1894, 1902) and Johnson (1913) regarded *Cyclostigma* as belonging to *Bothrodendron*, and combined these two genera with *Bothrodendron*. Tchirkova-Zalessky (1957, to see Cai & Wu, 1994) considered *Cyclostigma* as a subgenus of *Bothrodendron*, thus used the notation "*Bothrodendron* (*Cyclostigma*)". The late Chinese palaeobotanist Sze (1952, 1953) pointed out that *Cyclostigma* possess a ligular pit, whilst *Bothrodendron* is without a ligular pit, hence these two genera should not be merged as a single genus. A generic homonym was noticed by Potonié (1901), who proposed to preserve the generic names, automatically adding the prefix p- (p-*Cyclostigma*: Potonié, 1901). Cai & Wu (1994) suggested the existence or the non-existence of a ligular pit in the cortex should be considered with the preservative conditions and/or growth phases, according to the ligulatae and eligulatae *Lepidodendron*-like fossil plant stems found in the same strata in Chaohu, Anhui and so he too merged *Cyclostigma* into *Bothrodendron* as a subgenus, *Bothrodendron* (*Cyclostigma*). Chaloner (1968) examined the cone structure of *Jurinodendron* and he noticed that the cone structure is similar to the mainly Carboniferous *Lepidodendrales* and differs from homosporous *Lycopods* because it is heterosporous. So, up to now the taxonomic position of *Jurinodendron* is still unclear.

The status of the generic name *Cyclostigma* has been much discussed even in the 21<sup>st</sup> century. Although the proposal of *Jurinodendron* Doweld (2001) is valid, Doweld failed to include Chinese information on the distribution of *Jurinodendron* in China. More than a half century ago Sze, the late Chinese academician of palaeobotany had collected and studied *Jurinodendron* in China in detail. Followed by more and more specimens being collected from different localities around China in a short stratigraphic range and a substantially wide geographic distribution, *Jurinodendron* Doweld, is considered as a valuable guide fossil in China. In order to assist palaeobotanists in studying the



Fig. 1—Map showing the geographic distribution of *Jurinodendron* in China.

palaeogeographic distribution of *Jurinodendron*, we present here the geographic and stratigraphic distribution of the genus in China (Figs 1 & 2).

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Province/Region	District/ Subregion	Locality of section	Formation/Group	Stratigraphy	Position in Fig. 1	Reference
Xinjiang Autonomous Region	Western Zhungar	The southern slope of Sharburti mountain	Zhulumute Fm	D <sub>2</sub> <sup>2</sup> -D <sub>3</sub> <sup>1</sup>	1a	Li & Cai, 1988
	Hoboksar Mongol Zizhixian	Zhulumute	Zhulumute Fm	D <sub>2</sub> <sup>2</sup> -D <sub>3</sub> <sup>1</sup>	1b	Li & Cai, 1988
			Hongguleleng Fm	D <sub>3</sub> <sup>2</sup>	1b	Li & Cai, 1988
Qinghai Province	Golmud	Harza of Mangya Zhen	Harza Fm	D <sub>3</sub>	2	Li & Liu, 1997
		Hongliuquan	Heishan Fm	D <sub>3</sub>	2	Li & Liu, 1997
		Kendekeke	Maoniushan Fm	D <sub>3</sub>	2	Li & Liu, 1997
Gansu Province	Dulan	Dacaotan, Wadu	Dacaotan Gr	D <sub>3</sub>	3	Liu & Shen, 1983
Anhui Province	Zhang Xian	Shizikou	Wutong Fm	D <sub>3</sub> <sup>2</sup>	4	Qi <i>et al.</i> , 1997
	Chaohu	Fentou Village and Kongshan in Jiangning	Wutong Fm	D <sub>3</sub> <sup>2</sup>	5	Wang <i>et al.</i> , 1982
Jiangsu Province	Nanjing					
Hubei Province	Changyang	Ma'anshan	Huangjiadeng Fm	D <sub>3</sub> <sup>1</sup>	6a	Feng <i>et al.</i> , 1984b
			Luoyan Fm	D <sub>3</sub>	6a	Feng <i>et al.</i> , 1984b
	Yidu	Changlinggang	Xiejingsi Fm	D <sub>3</sub> <sup>2</sup>	6a	Cai & Wang, 1995
		Tizikou	Tizikou Fm	D <sub>3</sub> <sup>1</sup>	6a	Feng, 1984a
	Wuhan	Liangshan, Xiannvshan, Guodingshan	Huangjiadeng Fm	D <sub>3</sub> <sup>1</sup>	6b	Li, 2000
	Yichang	Guanzhuang	Xiejingsi Fm	D <sub>3</sub> <sup>2</sup>	6b	Li, 2000
	-		Tizikou Fm	D <sub>3</sub> <sup>1</sup>	6a	Feng <i>et al.</i> , 1984b
	Songzi	Xiushuigou in Lijuiachang	Xiejingsi Fm	D <sub>3</sub> <sup>2</sup>	6a	Feng <i>et al.</i> , 1984b
		Sanxikou in Lijuiachang	Tizikou Fm	D <sub>3</sub> <sup>1</sup>	6a	Feng, 1984a
		Guanyinya in Huangkuang	Xiejingsi Fm	D <sub>3</sub> <sup>2</sup>	6a	Feng, 1984a
	Jichun	Dalishan	Yuntauguan Fm	D <sub>3</sub> <sup>1</sup>	6b	Chen <i>et al.</i> , 1997
	Wuchang, Hanyang, Huangshi, Echeng		Wutong Fm	D <sub>3</sub> <sup>2</sup>	6b	Chen <i>et al.</i> , 1997
Hu'nan Province	Shimen	Majiagou	Xiejingsi Fm	D <sub>3</sub> <sup>2</sup>	7	Feng, 1978
	Fengxian	Yangshan	Xiejingsi Fm	D <sub>3</sub> <sup>2</sup>	7	Tan & Zhu, 1997
		Shanmen	Huangjiadeng Fm	D <sub>3</sub>	7	Tan & Zhu, 1997
	Sangzhi	Taozixi, Xilian	Huangjiadeng Fm	D <sub>3</sub>	7	Tan & Zhu, 1997
	Xihua	Xikuangshan	Wutong Fm	D <sub>3</sub>	7	Tan & Zhu, 1997
	Lengshuijiang	Oujiachong	Oujiachong Fm	D <sub>3</sub> <sup>2</sup>	7	Tan & Zhu, 1997
	Xinshao	Malanbian	Oujiachong Fm	D <sub>3</sub> <sup>2</sup>	7	Tan & Zhu, 1997
	Longhui	Zhouwangpu	Oujiachong Fm	D <sub>3</sub> <sup>2</sup>	7	Tan & Zhu, 1997
	Shaodong	Yutianqiao	Oujiachong Fm	D <sub>3</sub> <sup>2</sup>	7	Tan & Zhu, 1997
Guizhou Province	GuiZhu	Qingya	Oujiachong Fm	D <sub>3</sub>	8	Li, 1963
Jiangxi Province	Yongxing	Lianhua	Huangtang Fm	D <sub>3</sub> <sup>1</sup>	9	Zhu <i>et al.</i> , 1983
	Yudu	Xiashan	Zhongpeng Fm	D <sub>3</sub> <sup>1</sup>	9	Li, 1963
Fujian Province	Longyan	Tianwadong in Linbang	Tianwadong Fm	D <sub>3</sub> <sup>1</sup>	10	Wang, 1997
		Taozikong in Linbang	Taozikong Fm	D <sub>3</sub> <sup>2</sup>	10	Wang, 1997
	Liancheng	Jiangjunshan	Taozikong Fm	D <sub>3</sub> <sup>2</sup>	10	Wang, 1997
	Yongding	Bijiashan	Taozikong Fm	D <sub>3</sub> <sup>2</sup>	10	Wang, 1997
Guangdong Province	Guangzhou	Dasha Village	Heshuigang Fm	D <sub>3</sub>	11	Fang, 1965
	Kaiping, Shaoguan, Yingde, Renhua		Maozifeng Fm	D <sub>3</sub>	11	Cai & Wang, 1995

Fig. 2.—The geographic and the stratigraphic distribution of *Juriodendron* in China. (D<sub>2</sub><sup>2</sup>, The Middle Devonian, D<sub>3</sub><sup>1</sup>—The Upper Devonian).

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