



## Checklist of the Cretaceous gymnospermous wood (updated December 2024)

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### Abstract

A list of all known fossil wood taxa recorded from the Cretaceous, up to December of 2024, is given. The list contains 57 genera and 317 species of gymnospermous wood described from 48 countries across seven continents. 39 genera and 165 species were reported from Asia, 28 genera and 67 species from Europe, 33 genera and 48 species from Africa, 20 genera and 48 species from North America, 13 genera and 35 species from South America, 4 genera and 4 species from Australia and 5 genera and 12 species from Antarctica. 54 genera and 171 species were documented from the Lower Cretaceous, and 26 genera and 76 species from the Upper Cretaceous. Systematically, 1 genus and 2 species belong to Cycadales, 1 monotypic genus belongs to Bennettitales, 2 genera and 3 species belong to Ginkgoales, 52 genera and 306 species are of Coniferales, and 1 genus and 3 species are *incertae sedis*.

**Keywords:** fossil wood, Cretaceous, palaeogeographical distribution, stratigraphic distribution

### Introduction

The Cretaceous was an important period for the diversification and radiation of gymnosperms and saw a great variety of fossil gymnospermous wood at the time (Bamford & Corbett, 1994, 1995; Falcon-Lang & Cantrill, 2000; Philippe *et al.*, 2004a, b, 2006; Thorn, 2005; Zhang *et al.*, 2015; Yang *et al.*, 2022; Martinez *et al.*, 2023; Zhu *et al.*, 2024). However, a comprehensive reference for the taxonomy, nomenclature, and literature of the Cretaceous gymnospermous wood is not available at present. In this paper, we provided the first primitive checklist of the Cretaceous gymnospermous wood based on a thorough literature survey, with a peculiar emphasis on their geographical and stratigraphic distributions.

### Results

Our study shows that a total of 57 fossil-genera and 317 fossil-species of gymnospermous wood have been formally described from the Cretaceous of 48 countries spanning all seven continents (Table 1). Geographically, 39 genera and 165 species were reported from Asia, 28 genera and 67 species from Europe, 13 genera and 33 species from Africa, 20 genera and 48 species from North America, 13 genera and 35 species from South America, 4 genera and 4 species from Australia and 2 genera and 12 species from Antarctica (Figs 1, 2), with the most diverse (29 genera and 77 species) fossil wood documented in China. Stratigraphically, 54 genera and 171 species were documented from the Lower Cretaceous, and 26 genera and 76 species from the Upper Cretaceous (Fig. 3). Systematically, 1 genus and 2 species belong to Cycadales, 1 monotypic genus belongs to Bennettitales, 2 genera and 3 species belong to Ginkgoales, 52 genera and 306 species are of Coniferales, and 1 genus and 3 species are *incertae sedis* (Fig. 4).

Most of the Cretaceous wood taxa were locally distributed worldwide (Fig. 1). However, 10 genera were distributed globally and dichronologically dominated the wood-diversity through the Cretaceous (Fig. 5), *i.e.*, *Agathoxylon* Harting 1848 (= *Araucarioxylon* Kraus 1870, *Dadoxylon* Endlicher 1847, 49 species), *Cupressioxylon* Gothan 1905 (33 species), *Podocarpoxyton* Gothan 1906 (18 species), *Protocedroxylon* Gothan 1910 (17 species), *Brachyoxylon* Hollick & Jeffrey 1909 (16 species), *Xenoxylon* Gothan 1905 (16 species), *Piceoxylon* Gothan 1905 (13 species), *Cedroxylon* Gothan 1905 (12 species), *Protopodocarpoxyton* Eckhold 1922 (12 species), and *Taxodioxyton* Gothan 1906 (12 species). Totally, 17 genera were distributed from the Triassic to the Cretaceous worldwide: *Agathoxylon* Harting 1848, *Baieroxylon*

**TABLE 1.** Fossil gymnospermous wood from the Cretaceous.

Species	Preservation status	Horizon and age	Locality	References
<i>Agathoxylon</i> sp.	Secondary xylem	Early–Late Cretaceous	Xinjiang, Zhejiang, China; Antarctica; New Zealand; Near village Kota, Gadchiroli, Maharashtra, India; North of Kerman, Iran; Cerro Alto, Argentina; Antarctica; Hungary; UK; Chile; Columbia; Peru	Falcon-Lang & Cantrill, 2000; Thorn, 2005; Rajanikanth & Sukh-Dev, 1989; Poole & Ataabadi, 2005; Martinez <i>et al.</i> , 2023; Zhu <i>et al.</i> , 2018; Philippe <i>et al.</i> , 2010; Vanner <i>et al.</i> , 2024
<i>Agathoxylon antarcticum</i> Poole & Cantrill, 2001	Secondary xylem	Punta del Barco Fm., Kachaika Fm.; Early Cretaceous	Santa Cruz Province, Argentina	Poole & Cantrill, 2001; Vera <i>et al.</i> , 2019
<i>Agathoxylon arayaii</i> Torres, Valenzuela & Gonzalez, 1982	Secondary xylem	Early Cretaceous	Santa Cruz Province, Argentina	Torres <i>et al.</i> , 1982
<i>Agathoxylon chapmanae</i> Poole & Cantrill, 2001	Secondary xylem	Late Cretaceous	Antarctica	Poole & Cantrill, 2001
<i>Agathoxylon floresii</i> Torres & Lemoigne, 1989	Secondary xylem	Late Cretaceous	Antarctica	Torres & Lemoigne, 1989
<i>Agathoxylon kellerense</i> Lucas & Lacey, 1981	Secondary xylem	Punta del Barco Fm.; Early–Late Cretaceous	Santa Cruz Province, Argentina, Chile, Antarctica	Lucas & Lacey, 1981; Nishida <i>et al.</i> 1992; Pujana <i>et al.</i> , 2017
<i>Agathoxylon mendezii</i> Del Fueyo, 2021	Secondary xylem	Springhill Fm.; Early Cretaceous	Santa Cruz Province, Argentina	Del Fueyo <i>et al.</i> , 2021
<i>Agathoxylon nepalense</i> Paudyal, 2016	Secondary xylem	Kagbeni Fm.; Early Cretaceous	Nepal	Paudyal <i>et al.</i> , 2016
<i>Agathoxylon ohzuanum</i> (Nishida, Ohsawa, Nishida & Rancusi, 1992) Gnaedinger & Herbst, 2009	Secondary xylem	Late Cretaceous	Chile	Nishida <i>et al.</i> , 1992; Gnaedinger & Herbst, 2009
<i>Agathoxylon parachoshiense</i> Nishida & Nishida, 1987	Secondary xylem	Late Cretaceous	Chile	Nishida & Nishida, 1987
<i>Agathoxylon pichasquense</i> Torres & Rallo, 1981	Secondary xylem	Late Cretaceous	Chile	Torres & Rallo, 1981; Nishida <i>et al.</i> 1992
<i>Agathoxylon pluriresinosum</i> Torres & BiroBagoczky, 1986	Secondary xylem	Late Cretaceous	Chile	Torres & BiroBagoczky, 1986
<i>Agathoxylon pseudoparenchymatosum</i> Pujana, Santillana & Marensi, 2014	Secondary xylem	Punta del Barco Fm.; Early Cretaceous	Santa Cruz Province, Argentina	Pujana <i>et al.</i> , 2014
<i>Agathoxylon resinosum</i> Torres & Biro-Bagoczky, 1986	Secondary xylem	Late Cretaceous	Chile	Torres & BiroBagoczky, 1986
<i>Agathoxylon santanensis</i> Santos, 2021	Secondary xylem	Santana Fm.; Early Cretaceous	Ceará state, Brazil	Santos <i>et al.</i> , 2021
<i>Araucarioxylon batuense</i> Duan, 2000	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China	Duan, 2000
<i>Araucarioxylon biseriatum</i> Nishida, 1993	Secondary xylem	Cretaceous	Japan	Nishida <i>et al.</i> , 1993
<i>Araucarioxylon boppertoniae</i> Knowlton, 1889	Secondary xylem	Lakota Fm.; Early Cretaceous	USA	Knowlton, 1889
<i>Araucarioxylon choshiense</i> Nishida, 1963	Secondary xylem	Cretaceous	Japan	Nishida, 1963
<i>Araucarioxylon dallonii</i> Boureau, 1948	Secondary xylem	Early Cretaceous	Libya; Morocco; Tanzania; Chad	Boureau, 1948
<i>Araucarioxylon giftii</i> Jeyasingh & Kumarasamy, 1994	Secondary xylem	Early Cretaceous	India	Jeyasingh & Kumarasamy, 1994

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TABLE 1 (Continued)

Species	Preservation status	Horizon and age	Locality	References
<i>Araucarioxylon hujinamiense</i> Nishida, 1973	Secondary xylem	Cretaceous	Japan	Nishida, 1973
<i>Araucarioxylon inuboense</i> Nishida, 1964	Secondary xylem	Cretaceous	Japan	Nishida & Nishida, 1983
<i>Araucarioxylon japonicum</i> Shimakura, 1936	Secondary xylem	Early Cretaceous	Japan	Shimakura, 1936
<i>Araucarioxylon jimoense</i> Zhang & Wang, 1987	Secondary xylem	Early Cretaceous	Shandong Province, China	Duan, 2000
<i>Araucarioxylon kiiense</i> Ogura, 1983	Secondary xylem	Early–Late Cretaceous	Japan	Nishida & Nishida, 1983
<i>Araucarioxylon lugriense</i> Boureau, 1948	Secondary xylem	Cretaceous	Libya	Boureau, 1948
<i>Araucarioxylon mosurensense</i> Jeyasingh & Kumarasamy, 1994	Secondary xylem	Cretaceous	India	Jeyasingh & Kumarasamy, 1994
<i>Araucarioxylon noveboracense</i> Hollick & Jeffrey, 1909	Secondary xylem	Cretaceous	USA	Hollick & Jeffrey, 1909
<i>Araucarioxylon prosseri</i> Penhallow, 1900	Secondary xylem	Cretaceous	USA	Penhallow, 1900
<i>Araucarioxylon pseudochoshiense</i> Nishida, 1986	Secondary xylem	Late Cretaceous	Japan	Nishida & Nishida, 1986
<i>Araucarioxylon rajivii</i> Jeyasingh & Kumarasamy, 1994	Secondary xylem	Early Cretaceous	Japan	Jeyasingh & Kumarasamy, 1994
<i>Araucarioxylon sahariense</i> Veillet-Bartoszewska, 1956	Secondary xylem	Cretaceous	Libya	Veillet-Bartoszewska, 1956
<i>Araucarioxylon septatum</i> Boureau, 1951	Secondary xylem	Cretaceous	Mali	Boureau, 1951
<i>Araucarioxylon sidugawaense</i> Shimakura, 1936	Secondary xylem	Yixian Fm.; Early Cretaceous	Liaoning Province, China; Japan	Duan, 2000
<i>Araucarioxylon tankoense</i> Stopes & Fujii, 1909	Secondary xylem	Late Cretaceous	Japan	Stopes & Fujii, 1909
<i>Araucarioxylon termieri</i> Attires, 1965	Secondary xylem	Cretaceous	Tanzania	Attires, 1965
<i>Araucarioxylon virginianum</i> Knowlton, 1889	Secondary xylem	Cretaceous	USA	Knowlton, 1889
<i>Araucarioxylon xinchangense</i> Duan, 2000	Secondary xylem	Guantou Fm.; Early Cretaceous	Zhejiang Province, China	Duan, 2000
<i>Araucarioxylon zeelandii</i> Stopes, 1914	Secondary xylem	Cretaceous	New Zealand	Stopes, 1914
<i>Austrocupressinoxylon barcinense</i> Nunes, Bodnar & Escapa, 2019	Secondary xylem	Cerro Barcino Fm.; Early Cretaceous	Chubut Province, Argentina	Nunes <i>et al.</i> , 2019
<i>Baieroxylon</i> sp.	Secondary xylem	Early Cretaceous	Hungary; Argentina	Philippe <i>et al.</i> , 2006
<i>Brachyoxylo</i> sp.	Secondary xylem	Early–Late Cretaceous	China; France; Antarctica; Mexico; Russia; South Korea; USA; Cameroon; Tunisia; Spain; Southern Africa; Japan; Argentina; Thailand; Hungary; Portugal; Belgium; Ukraine; Hungary	Néraudeau <i>et al.</i> , 2003; Torres <i>et al.</i> , 1997; Machhour & Pons, 1992; Cevallos-Ferriz, 1992; Shimakura, 1937; Vozenin-Serra & Pons, 1990; Oh <i>et al.</i> , 2011; Holden, 1914; Dupéron-Laudoueneix, 1991a, b; Xie <i>et al.</i> , 2023
<i>Brachyoxylo avramii</i> Iamandei & Iamandei, 2005	Secondary xylem	Early Cretaceous	Romania	Iamandei & Iamandei, 2005

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TABLE 1 (Continued)

Species	Preservation status	Horizon and age	Locality	References
<i>Brachyoxylon baqueroensis</i> Vera & Cesari, 2015	Secondary xylem	Late Cretaceous	Santa Cruz Province, Argentina	Vera & Cesari, 2015
<i>Brachyoxylon brachyphylloides</i> Kräusel, 1949	Secondary xylem	Cretaceous	USA; Niger; Chad; Tunisia; Hungary	Kräusel, 1949; Veillet-Bartoszewska, 1954; Laudouéneix, 1973; Gazeau & Koeniger, 1970; Philippe <i>et al.</i> , 2006
<i>Brachyoxylon comanchense</i> Torrey, 1923	Secondary xylem	Cretaceous	USA	Torrey, 1923
<i>Brachyoxylon dobrogiacum</i> Iamandei & Iamandei, 2005	Secondary xylem	Early Cretaceous	Romania	Iamandei & Iamandei, 2005
<i>Brachyoxylon hervei</i> Torres, 1982	Secondary xylem	Early Cretaceous	Antarctica	Torres <i>et al.</i> , 1982
<i>Brachyoxylon japonicum</i> Kräusel, 1949	Secondary xylem	Early Cretaceous	Japan	Kräusel, 1949
<i>Brachyoxylon lalongense</i> Yang, 2022	Secondary xylem	Duoni Fm.; Early Cretaceous	Lalong Village, Tibet, China; Chad	Dupéron-Laoudoueneix, 1991a, b; Yang & Li, 2022
<i>Brachyoxylon notabile</i> Hollick & Jeffrey, 1909	Secondary xylem	Late Cretaceous	USA	Hollick & Jeffrey 1909
<i>Brachyoxylon patagonicum</i> Rombola, Greppi & Pujana, 2022	Secondary xylem	Kachaike Fm.; Early Cretaceous	Santa Cruz Province, Argentina	Rombola <i>et al.</i> , 2022
<i>Brachyoxylon serrae</i> Philippe <i>et al.</i> , 2011	Secondary xylem	Early Cretaceous	Thailand	Philippe <i>et al.</i> , 2011
<i>Brachyoxylon raritanense</i> Torrey, 1923	Secondary xylem	Castillo Fm.; Early Cretaceous	Chubut Province, Argentina	Torrey, 1923; Greppi <i>et al.</i> , 2020
<i>Brachyoxylon woodworthianum</i> Torrey, 1923	Secondary xylem	Early Cretaceous	USA	Torrey, 1923
<i>Brachyoxylon zhejiangense</i> Tian, Zhu & Wang, 2018	Secondary xylem	Early Cretaceous	Zhejiang Province, China	Tian <i>et al.</i> , 2018; Hui <i>et al.</i> , 2024
<i>Brachyoxylon zhouii</i> Jiang, Tian, Wu & Wang, 2020	Secondary xylem	Early Cretaceous	Zhejiang Province, China	Jiang <i>et al.</i> , 2020
<i>Cedroxylon</i> sp.	Secondary xylem	Early Cretaceous	Heilongjiang Province, China	Cheng <i>et al.</i> , 2023
<i>Cedroxylon arcticum</i> Shilkina, 1967	Secondary xylem	Early Cretaceous	Russia	Shilkina, 1967
<i>Cedroxylon blewillense</i> Lignier, 1907	Secondary xylem	Cretaceous	France	Lignier, 1907; Philippe <i>et al.</i> , 2018
<i>Cedroxylon disjunctum</i> Bannan & Fry, 1957	Secondary xylem	Christopher Fm.; Early Cretaceous	Canada	Bannan & Fry, 1957
<i>Cedroxylon inaequal</i> Nishida, 1973	Secondary xylem	Cretaceous	Japan	Nishida, 1973
<i>Cedroxylon jinshaense</i> He, 1995	Secondary xylem	Yimin Fm.; Early Cretaceous	Inner Mongolia, China	He, 1995
<i>Cedroxylon maidstonense</i> Stopes, 1915	Secondary xylem	Cretaceous	UK	Stopes, 1915
<i>Cedroxylon pottoniense</i> Stopes, 1915	Secondary xylem	Cretaceous	UK	Stopes, 1915
<i>Cedroxylon matsumura</i> Stopes & Fujii, 1909	Secondary xylem	Early Cretaceous	Japan	Stopes & Fujii, 1909
<i>Cedroxylon parenchymatosum</i> Nishida, 1993	Secondary xylem	Late Cretaceous	Japan	Nishida, 1993
<i>Cedroxylon shimakurae</i> Nishida, 1986	Secondary xylem	Late Cretaceous	Japan	Nishida & Nishida, 1986
<i>Cedroxylon yendoii</i> Stopes & Fujii, 1909	Secondary xylem	Late Cretaceous	Japan	Stopes & Fujii, 1909
<i>Chamaecyparixylon</i> sp.	Secondary xylem	Early Cretaceous	Romania	Philippe <i>et al.</i> , 2006
<i>Circoporoxylon amarijolense</i> Kräusel & Jain, 1963	Secondary xylem	Late Cretaceous	Rajmahal, India	Kräusel & Jain, 1964

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TABLE 1 (Continued)

Species	Preservation status	Horizon and age	Locality	References
<i>Circoporoxylon gregussii</i> Del Furo, 1998	Secondary xylem	Allen Fm.; Late Cretaceous	Rio Negro Province, Argentina	Del Furo, 1998
<i>Circoporoxylon kräuseli</i> Martínez & Lutz, 2007	Secondary xylem	Early Cretaceous	Neuquen Province, Argentina	Martínez & Lutz, 2007
<i>Circoporoxylon mongolense</i> Ding, Fu, Li & Zhang, 2010	Secondary xylem	Tsagan Tsav Fm.; Early Cretaceous	Ömnögovi Province, Mongolia	Ding <i>et al.</i> , 2010
<i>Circoporoxylon woburnense</i> Kräusel, 1949	Secondary xylem	Early Cretaceous	Russia	Kräusel, 1949
<i>Cratoxylon placidoi</i> Conceição, Gobo, Batista, Mastroberti, Iannuzzi, Bamford & Kunzmann, 2024	Pith, Primary xylem, Secondary xylem	Crato Fm.; Early Cretaceous	Quarry Três irmãos, Nova Olinda, Ceará, Brazil	Conceição <i>et al.</i> , 2024
<i>Cupressinoxylon</i> sp.	Secondary xylem	Early–Late Cretaceous	Heilongjiang Province, China; Argentina; Czech Republic; Denmark; Sweden; USA; Canada	Egerton <i>et al.</i> , 2016; Cheng <i>et al.</i> , 2023; Philippe <i>et al.</i> , 2006; Vanner <i>et al.</i> , 2024
<i>Cupressinoxylon baomiqiaoense</i> Zheng & Zhang, 1982	Secondary xylem	Yangtun Fm.; Early Cretaceous	Heilongjiang Province, China	Zheng & Zhang, 1982
<i>Cupressinoxylon bibbinsi</i> Knowlton, 1896	Secondary xylem	Cretaceous	USA	Knowlton, 1896
<i>Cupressinoxylon borealis</i> Vaudois & Privé, 1971	Secondary xylem	Cretaceous	USA	Vaudois & Privé, 1971
<i>Cupressinoxylon camponovensis</i> Oliveira, 1936	Secondary xylem	Early Cretaceous	Brazil	Oliveira, 1936
<i>Cupressinoxylon cheyemense</i> Penhallow, 1900	Secondary xylem	Cretaceous	USA	Penhallow, 1900
<i>Cupressinoxylon colombianum</i> Knowlton, 1896	Secondary xylem	Cretaceous	USA	Knowlton, 1896
<i>Cupressinoxylon coloradensis</i> Knowlton, 1896	Secondary xylem	Cretaceous	USA	Knowlton, 1896
<i>Cupressinoxylon comanchense</i> Penhallow, 1900	Secondary xylem	Cretaceous	USA	Penhallow, 1900
<i>Cupressinoxylon cryptomerioides</i> Stopes, 1915	Secondary xylem	Late Cretaceous	Japan; UK	Stopes, 1915
<i>Cupressinoxylon dianneae</i> Vanner, Conran, Larcombe & Lee, 2024	Secondary xylem	Cretaceous	New Zealand	Vanner <i>et al.</i> , 2024
<i>Cupressinoxylon diskoense</i> Walton & Shilkina, 1967	Secondary xylem	Early Cretaceous	Russia	Shilkina, 1967
<i>Cupressinoxylon elongatum</i> Knowlton, 1888	Secondary xylem	Cretaceous	USA	Knowlton, 1888
<i>Cupressinoxylon glasgowi</i> Knowlton, 1888	Secondary xylem	Cretaceous	USA	Knowlton, 1888
<i>Cupressinoxylon gothanii</i> Penhallow, 1908	Secondary xylem	Early Cretaceous	Canada	Penhallow, 1908
<i>Cupressinoxylon hortii</i> Stopes, 1915	Secondary xylem	Cretaceous	UK	Stopes, 1915
<i>Cupressinoxylon jamanjarsaense</i> Chudajberdyev, 1981	Secondary xylem	Cretaceous	Uzbekistan	Chudajberdyev, 1981
<i>Cupressinoxylon jiyainense</i> Wang, Wang & Chen, 1997	Secondary xylem	Jiameng Gr.; Late Cretaceous	Heilongjiang Province, China	Wang <i>et al.</i> , 1997

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TABLE 1 (Continued)

Species	Preservation status	Horizon and age	Locality	References
<i>Cupressinoxylon kiprianovii</i> Mercklin, 1855	Secondary xylem	Cretaceous	Russia	Mercklin, 1855
<i>Cupressinoxylon kiroviense</i> Shilkina, 1989	Secondary xylem	Cretaceous	Russia	Shilkina, 1989
<i>Cupressinoxylon luccombense</i> Stopes, 1915	Secondary xylem	Cretaceous	UK	Stopes, 1915
<i>Cupressinoxylon macrocarpoides</i> Penhallow, 1908	Secondary xylem	Cretaceous	Canada	Penhallow, 1908
<i>Cupressinoxylon manuelii</i> Ríos-Santos, Cevallos-Ferriz & Pujana, 2020	Secondary xylem	Cabullona Gr.; Late Cretaceous	Mexico	Ríos-Santos <i>et al.</i> , 2020
<i>Cupressinoxylon mcgeei</i> Knowlton, 1889	Secondary xylem	Cretaceous	USA	Knowlton, 1889
<i>Cupressinoxylon pulchellum</i> Knowlton, 1889	Secondary xylem	Cretaceous	USA	Knowlton, 1889
<i>Cupressinoxylon sachalinense</i> Shimakura, 1937	Secondary xylem	Late Cretaceous	Japan	Shimakura, 1937
<i>Cupressinoxylon severzovii</i> Mercklin, 1852	Secondary xylem	Cretaceous	Russia	Mercklin, 1852
<i>Cupressinoxylon sibiricum</i> Baranov & Nikolaev, 1956	Secondary xylem	Late Cretaceous	Russia	Baranov & Nikolaev, 1956
<i>Cupressinoxylon ucrainicum</i> Mercklin, 1852	Secondary xylem	Early Cretaceous	Russia	Mercklin, 1852
<i>Cupressinoxylon uhangriense</i> Kim & Jeong, 2002	Secondary xylem	Dadaepo Fm.; Late Cretaceous	South Korea	Kim & Jeong, 2002
<i>Cupressinoxylon vectense</i> Barber, 1898	Secondary xylem	Early Cretaceous	Japan; UK	Barber, 1898
<i>Cupressinoxylon vermejoense</i> Knowlton, 1896	Secondary xylem	Cretaceous	USA	Knowlton, 1896
<i>Cupressinoxylon wardi</i> Knowlton, 1889	Secondary xylem	Cretaceous	USA	Knowlton, 1889
<i>Dadoxylon agarhioides</i> Kräusel & Jain, 1963	Secondary xylem	Late Cretaceous	Rajmahal, India	Kräusel & Jain, 1964
<i>Dadoxylon amboensis</i> Lemoigne, 1971	Secondary xylem	Cretaceous	Ethiopia	Lemoigne & Naryan Schyfsma, 1971; Philippe <i>et al.</i> , 2004a, b
<i>Dadoxylon amraparensis</i> Sah & Jain, 1964	Secondary xylem	Cretaceous	Rajmahal, India	Sah & Jain, 1964
<i>Dadoxylon benderi</i> Mussa, 1959	Secondary xylem	Early Cretaceous	Brazil	Mussa, 1959
<i>Dadoxylon bindrabunense</i> Sah & Jain, 1964	Secondary xylem	Cretaceous	Rajmahal, India	Sah & Jain, 1964
<i>Dadoxylon byeongpungense</i> Kim & Jeong, 2002	Secondary xylem	Dadaepo Fm.; Late Cretaceous	South Korea	Kim & Jeong, 2002
<i>Dadoxylon dantzii</i> Potonié, 1902	Secondary xylem	Cretaceous	Tanganyika	Potonié, 1902; Philippe <i>et al.</i> , 2004a, b
<i>Dadoxylon mandroense</i> Sah & Jain, 1964	Secondary xylem	Cretaceous	Rajmahal, India	Sah & Jain, 1964
<i>Dadoxylon santalense</i> Sah & Jain, 1964	Secondary xylem	Cretaceous	Rajmahal, India	Sah & Jain, 1964
<i>Dadoxylon teixeirae</i> Boureau, 1951	Secondary xylem	Cretaceous	Morocco; Portugal	Boureau, 1951; Philippe <i>et al.</i> , 2004a, b

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TABLE 1 (Continued)

Species	Preservation status	Horizon and age	Locality	References
<i>Glyptostroboxylon xidapoense</i> Zheng & Zhang, 1982	Secondary xylem	Muleng Fm.; Early Cretaceous	Heilongjiang Province, China	Zheng & Zhang, 1982
<i>Ginkgoxylon chinense</i> Zhang & Zheng, 2000	Pith, Primary xylem, Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China	Zhang <i>et al.</i> , 2000a
<i>Ginkgoxylon gruettii</i> Pons & Vozenin-Serra, 1992	Secondary xylem	Cretaceous	Czech Republic	Pons & Vozenin-Serra, 1992
<i>Juniperoxylon turonense</i> Houlbert, 1910	Secondary xylem	Early Cretaceous	Canada	Houlbert, 1910
<i>Kaokoxyloxyton reuningi</i> Kräusel, 1956	Secondary xylem	Early Cretaceous	Namibia	Kräusel, 1956
<i>Kaokoxyloxyton durum</i> Kräusel, 1956	Secondary xylem	Early Cretaceous	Namibia	Kräusel, 1956
<i>Keteleeria fortunei</i> Carrière, 1866	Secondary xylem	Late Cretaceous	Henan Province, China	Carrière, 1866; Yang <i>et al.</i> , 1990
<i>Keteleeria huolinshensis</i> Zhu, Li, Tian & Wang, 2024	Pith, Primary xylem, Secondary xylem	Huolinhe Fm.; Early Cretaceous	Inner Mongolia, China	Zhu <i>et al.</i> , 2024
<i>Keteleerioxylon</i> sp.	Secondary xylem	Early Cretaceous	Heilongjiang Province, China	Cheng <i>et al.</i> , 2023
<i>Keteleerioxylon arcticum</i> Shilk, 1960	Secondary xylem	Late Cretaceous	Franz Josef Land, Russia	Shilkina, 1960
<i>Keteleerioxylon changchunense</i> Shi, Sun, Meng & Yu, 2022	Secondary xylem	Yingcheng Fm.; Early Cretaceous	Jilin Province, China	Shi <i>et al.</i> , 2022
<i>Keteleerioxylon fokinii</i> Shilk, 1986	Secondary xylem	Early Cretaceous	Kirovsk Region, Russia	Shilkina, 1986
<i>Keteleerioxylon kamtschatkiense</i> Blokhina & Afonin, 2006	Secondary xylem	Early Cretaceous	Kamchatka Peninsula, Russia	Blokhina <i>et al.</i> , 2006
<i>Keteleerioxylon shandongense</i> Hao, Jiang, Tian & Wang, 2024	Secondary xylem	Zhifengzhuang Fm.; Early Cretaceous	Shandong Province, China	Hao <i>et al.</i> , 2024
<i>Laricioxylon nogradense</i> Greguss, 1967	Secondary xylem	Early Cretaceous	Canada	Greguss, 1967
<i>Lhassoxylon aptianum</i> Vozenin-Serra & Pons, 1990	Pith, Primary xylem, Secondary xylem	Early Cretaceous	Lhasa, Tibet, China	Vozenin-Serra & Pons, 1990
<i>Lobatoxylon kaokense</i> Kräusel, 1956	Pith, Primary xylem, Secondary xylem	Early Cretaceous	Namibia	Kräusel, 1956
<i>Megaporoxyton kaokense</i> Kräusel, 1956	Secondary xylem	Early Cretaceous	Namibia	Kräusel, 1956
<i>Mesembrioxylon</i> sp.	Secondary xylem	Dadaepo Fm.; Early–Late Cretaceous	South Korea; Japan	Kim & Jeong, 2002
<i>Mesembrioxylon chichibuense</i> Nishida, 1983	Secondary xylem	Cretaceous	Japan	Nishida, 1983
<i>Mesembrioxylon parthasarthyi</i> Sahni, 1931	Secondary xylem	Cretaceous	India	Sahni, 1931; Philippe <i>et al.</i> , 2004a, b
<i>Mesembrioxylon rajmahalense</i> Jain, 1965	Pith, primary xylem, secondary xylem	Cretaceous	Rajmahal, India	Jain, 1965
<i>Mesembrioxylon sarmai</i> Varma, 1954	Pith, primary xylem, secondary xylem	Cretaceous	India; South Africa	Varma, 1954; Bamford & Corbett, 1994
<i>Mesembrioxylon stokes</i> Bamford & Corbett, 1995	Secondary xylem	Early Cretaceous	South Africa	Bamford & Corbett, 1995
<i>Mesembrioxylon taneichiense</i> Nishida, 1983	Secondary xylem	Late Cretaceous	Japan	Nishida, 1983
<i>Mesembrioxylon thirumangalense</i> Suryanarayana, 1953	Secondary xylem	Cretaceous	India	Suryanarayana, 1953

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TABLE 1 (Continued)

Species	Preservation status	Horizon and age	Locality	References
<i>Mesembrioxylon trichinopoliense</i> Varma, 1954	Secondary xylem	Cretaceous	India	Varma, 1954
<i>Mesembrioxylon woburnse</i> Bamford & Corbett, 1995	Secondary xylem	Early Cretaceous	South Africa	Bamford & Corbett, 1995
<i>Metacupressinoxylon</i> sp.	Secondary xylem	Cretaceous	Japan	Zhang <i>et al.</i> , 2015
<i>Metacupressinoxylon dacrydioides</i> Nishida, 1966	Secondary xylem	Cretaceous	Japan	Nishida, 1966
<i>Oguraxylon pseudoyubarebse</i> Nishida, 1984	Secondary xylem	Cretaceous	Japan	Nishida, 1984
<i>Oguraxylon yubariense</i> Nishida, 1984	Secondary xylem	Cretaceous	Japan	Nishida, 1984
<i>Palaeopiceoxylon arcticum</i> Shilkina, 1967	Secondary xylem	Early Cretaceous	Russia	Shilkina, 1967
<i>Palaeopiceoxylon transiens</i> (Shimakura, 1937) Kräusel, 1949	Secondary xylem	Early Cretaceous	Canada	Kräusel, 1949
<i>Palaeopinuxylon josuei</i> Mussa, 1974	Secondary xylem	Early Cretaceous	Brazil	Mussa, 1974
<i>Paracupressinoxylon</i> <i>cryptomeriopsoides</i> Shimakura, 1937	Secondary xylem	Late Cretaceous	Japan	Shimakura, 1937
<i>Paracupressinoxylon potomacense</i> Sinnott & Bartlett, 1916	Secondary xylem	Potomac Fm.; Early Cretaceous	USA	Sinnott & Bartlett, 1916
<i>Paracupressinoxylon shimakurae</i> Nishida, 1965	Secondary xylem	Cretaceous	Japan	Nishida, 1965
<i>Paracupressinoxylon solmsi</i> Shimakura, 1937	Secondary xylem	Late Cretaceous	Japan	Shimakura, 1937
<i>Phyllocladoxylon</i> sp.	Secondary xylem	Early Cretaceous	Württemberg, Germany	Müller-Stoll & Schultze-Motel, 1990
<i>Phyllocladoxylon antarcticum</i> Gothan, 1908	Secondary xylem	Late Cretaceous	Chile	Gothan, 1908
<i>Phyllocladoxylon densum</i> He, 1995	Secondary xylem	Yimin Fm.; Early Cretaceous	Inner Mongolia, China	He, 1995
<i>Phyllocladoxylon eboracense</i> Holden, 1914	Secondary xylem	Huolinhe Fm.; Early Cretaceous	Inner Mongolia, China	Holden, 1914
<i>Phyllocladoxylon</i> cf. <i>eboracense</i> (Holden) Kräusel, 1995	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China	Wu <i>et al.</i> , 2021
<i>Phyllocladoxylon hailaerense</i> He, 1995	Secondary xylem	Yimin Fm.; Early Cretaceous	Inner Mongolia, China	He, 1995
<i>Phyllocladoxylon xinqiuensis</i> Cui & Liu, 1992	Secondary xylem	Fuxin Fm.; Early Cretaceous	Liaoning Province, China	Cui & Liu, 1992
<i>Phoroxylon qiezihense</i> Zheng & Zhang, 1982	Secondary xylem	Chengzihe Fm.; Early Cretaceous	Heilongjiang Province, China	Zheng & Zhang, 1982
<i>Phoroxylon scalariforme</i> Sze, 1951	Secondary xylem	Chengzihe Fm.; Early Cretaceous	Heilongjiang Province, China	Sze, 1951
<i>Piceoxylon</i> sp.	Secondary xylem	Early–Late Cretaceous	Heilongjiang Province, China; Japan	Cheng <i>et al.</i> , 2023
<i>Piceoxylon antiquum</i> Gothan, 1910	Secondary xylem	Early Cretaceous	Russia	Gothan, 1910
<i>Picea beaufortense</i> sp.	Secondary xylem	Early–Late Cretaceous	Canada	Roy & Hills, 1972
<i>Piceoxylon christopheri</i> Bannan & Fry, 1957	Secondary xylem	Christopher Fm.; Early Cretaceous	Canada	Bannan & Fry, 1957

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TABLE 1 (Continued)

Species	Preservation status	Horizon and age	Locality	References
<i>Piceoxylon iwatense</i> Nishida, 1988	Secondary xylem	Cretaceous	Japan	Nishida, 1988
<i>Piceoxylon macroporosum</i> Nishida, 1995	Secondary xylem	Late Cretaceous	Japan	Nishida & Nishida, 1995
<i>Piceoxylon manchuricum</i> Sze, 1951	Secondary xylem	Huashan Gr.; Late Cretaceous	Heilongjiang Province, China	Sze, 1951
<i>Piceoxylon piceoides</i> Shilkina, 1958	Secondary xylem	Late Cretaceous	Russia	Shilkina, 1958
<i>Piceoxylon priscum</i> He, 1995	Secondary xylem	Yimin Fm.; Early Cretaceous	Inner Mongolia, China	He, 1995
<i>Piceoxylon pseudoscleromedullosum</i> Nishida, 1995	Secondary xylem	Late Cretaceous	Japan	Nishida & Nishida, 1995
<i>Piceoxylon scleromedullosum</i> Shimakura, 1937	Secondary xylem	Late Cretaceous	Japan	Shimakura, 1937
<i>Piceoxylon thomsoni</i> Bannan & Fry, 1957	Secondary xylem	Isachsen Fm.; Early Cretaceous	Canada	Bannan & Fry, 1957
<i>Piceoxylon transiens</i> Shimakura, 1937	Secondary xylem	Late Cretaceous	Japan	Shimakura, 1937
<i>Piceoxylon zaocishanense</i> Ding, 2000	Secondary xylem	Yixian Fm.; Early Cretaceous	Inner Mongolia, China	Ding, 2000
<i>Pinoxylon dakotense</i> Read, 1932	Secondary xylem	Early–Late Cretaceous	USA; Japan	Read, 1932
<i>Pinus henanensis</i> Yang, 1990	Secondary xylem	Cretaceous	Henan Province, China	Yang, 1990
<i>Pinuxylon</i> sp.	Secondary xylem	Late Cretaceous	Belgium	Meijer, 2000
<i>Pinuxylon cavernosum</i> Zhang <i>et al.</i> , 2015	Secondary xylem	Early Cretaceous	Russia	Zhang <i>et al.</i> , 2015
<i>Pinuxylon microporosum</i> Nishida, 1995	Secondary xylem	Late Cretaceous	Japan	Nishida & Nishida, 1995
<i>Pityoxylon benstedii</i> Stopes, 1915	Secondary xylem	Cretaceous	UK	Stopes, 1915
<i>Pityoxylon sewardi</i> Stopes, 1915	Secondary xylem	Cretaceous	UK	Stopes, 1915
<i>Pityoxylon woodwardi</i> Stopes, 1915	Secondary xylem	Cretaceous	UK	Stopes, 1915
<i>Pityoxylon statenense</i> Hollick & Jeffrey, 1909	Secondary xylem	Cretaceous	USA	Hollick & Jeffrey, 1909
<i>Pityoxylon succiniferum</i> Kraus, 1870	Secondary xylem	Early Cretaceous	Canada	Kraus, 1870
<i>Planoxylon</i> sp.	Secondary xylem	Cerro Fortaleza Fm.; Early–Late Cretaceous	Argentina; Japan	Egerton <i>et al.</i> , 2016
<i>Planoxylon choshiense</i> Nishida, 1966	Secondary xylem	Cretaceous	Japan	Nishida, 1966
<i>Planoxylon inaii</i> Shimakura, 1937	Secondary xylem	Late Cretaceous	Japan	Shimakura, 1937
<i>Planoxylon pseudohectori</i> Nishida, 1962	Secondary xylem	Cretaceous	Japan	Nishida, 1962
<i>Planoxylon tylosissimum</i> Nishida, 1973	Secondary xylem	Cretaceous	Japan	Nishida, 1973
<i>Podocarpoxyylon</i> sp.	Secondary xylem	Early–Late Cretaceous	Heilongjiang Province, China; Argentina Antarctica; Hungary; Chile	Falcon-Lang & Cantrill, 2000; Egerton <i>et al.</i> , 2015; Cheng <i>et al.</i> , 2023
<i>Podocarpoxyylon bedfordense</i> Stopes, 1915	Secondary xylem	Cretaceous	UK	Stopes, 1915

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TABLE 1 (Continued)

Species	Preservation status	Horizon and age	Locality	References
<i>Podocarpoxylon chapmanae</i> Poole & Cantrill, 2001	Secondary xylem	Late Cretaceous	Antarctica	Poole & Cantrill, 2001
<i>Podocarpoxylon communis</i> Poole & Cantrill, 2001	Secondary xylem	Early–Late Cretaceous	Antarctica	Poole & Cantrill, 2001
<i>Podocarpoxylon dacrydioides</i> Cui, 1995	Secondary xylem	Huolinhe Fm.; Early Cretaceous	Inner Mongolia, China	Cui, 1995
<i>Podocarpoxylon garcie</i> Del Fueyo, 1998	Secondary xylem	Late Cretaceous	Argentina	Del Fueyo, 1998
<i>Podocarpoxylon garciae</i> Del Fueyo (Varela <i>et al.</i> , 2015)	Secondary xylem	Late Cretaceous	Argentina	Varela <i>et al.</i> , 2015
<i>Podocarpoxylon gothani</i> Stopes, 1915	Secondary xylem	Cretaceous	UK	Stopes, 1915
<i>Podocarpoxylon haburensis</i> Guleria & Shukla, 2008	Secondary xylem	Early Cretaceous	India	Guleria & Shukla, 2008
<i>Podocarpoxylon mazzonii</i> (Petriella) Müller-Stoll & Schultze-Motel, 1990	Secondary xylem	Allen Fm.; Late Cretaceous	Río Negro Province, Argentina	Müller-Stoll & Schultze-Motel, 1990
<i>Podocarpoxylon muroshiense</i> Baranov & Nikolaev, 1956	Secondary xylem	Late Cretaceous	Russia	Baranov & Nikolaev, 1956
<i>Podocarpoxylon prumnopityoides</i> Gnaedinger, 2017	Secondary xylem	Mulichinco Fm.; Early Cretaceous	Neuquén Province, Argentina	Gnaedinger <i>et al.</i> , 2017
<i>Podocarpoxylon sciadopityoides</i> Shilkina, 1967	Secondary xylem	Early Cretaceous	Russia	Shilkina, 1967
<i>Podocarpoxylon solmsi</i> Stopes, 1915	Secondary xylem	Cretaceous	UK	Stopes, 1915
<i>Podocarpoxylon</i> cf. <i>umzambense</i> Schultze-Motel, Bamford & Corbett, 1994	Secondary xylem	Cretaceous	South Africa	Bamford & Corbett, 1994
<i>Podocarpoxylon verticalis</i> Poole & Cantrill, 2001	Secondary xylem	Late Cretaceous	Antarctica	Poole & Cantrill, 2001
<i>Podocarpoxylon woburnense</i> Stopes, 1915	Secondary xylem	Early Cretaceous	Japan; UK	Stopes, 1915
<i>Protaxodioxylon mongolense</i> Ding, Fu, Li & Zhang, 2010	Secondary xylem	Tsagan Tsav Fm.; Early Cretaceous	Ömnögovi Province, Mongolia	Ding <i>et al.</i> , 2010
<i>Protocedroxylon</i> sp.	Secondary xylem	Cretaceous	Japan	Zhang <i>et al.</i> , 2015
<i>Protocedroxylon araucarioides</i> Gothan, 1910	Secondary xylem	Early Cretaceous	Canada	Gothan, 1910
<i>Protocedroxylon cedroides</i> Shilkina & Khudaiberdyev, 1971	Secondary xylem	Early Cretaceous	Spitsbergen	Shilkina & Khudaiberdyev, 1971
<i>Protocedroxylon lindleanum</i> Ding, 2010	Secondary xylem	Tsagan Tsav Fm.; Early Cretaceous	Ömnögovi Province, Mongolia	Ding <i>et al.</i> , 2010
<i>Protocedroxylon irregular</i> (Gothan) Eckhold, 1921	Secondary xylem	Early Cretaceous	Spitsbergen	Eckhold, 1921
<i>Protocedroxylon japonicum</i> Nishida, 1967	Secondary xylem	Cretaceous	Kochi, Japan	Nishida, 1967
<i>Protocedroxylon kryshstofovichii</i> Shilkina, 1986	Secondary xylem	Early Cretaceous	Kirovgrad, Russia	Shilkina, 1986
<i>Protocedroxylon orientale</i> He, 1995	Secondary xylem	Huolinhe Fm.; Early Cretaceous	Inner Mongolia, China	He, 1995
<i>Protocedroxylon polyporosum</i> (Shilkina) Shilkina & Khudaiberdyev, 1971	Secondary xylem	Early Cretaceous	Franz Josef Land	Shilkina & Khudaiberdyev, 1971

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TABLE 1 (Continued)

Species	Preservation status	Horizon and age	Locality	References
<i>Protocedroxylon pseudoaraucarioides</i> Nishida, 1973	Secondary xylem	Cretaceous	Japan	Nishida, 1973
<i>Protocedroxylon shengjinbeigouense</i> Tian, Wang, Zhang & Zheng, 2016	Secondary xylem	Yixian Fm.; Early Cretaceous	Liaoning Province, China	Ding <i>et al.</i> , 2016
<i>Protocedroxylon stokesii</i> Thayne & Tidwell (Bamford & Corbett, 1994)	Secondary xylem	Early Cretaceous	South Africa	Bamford & Corbett, 1994
<i>Protocedroxylon transiens</i> (Gothan) Eckhold, 1921	Secondary xylem	Early Cretaceous	Spitsbergen	Eckhold, 1921
<i>Protocedroxylon trichinopoliense</i> Bose & Maheshwari, 1974	Secondary xylem	Cretaceous	India	Bose & Maheshwari, 1974
<i>Protocedroxylon umzambense</i> Schultze- Motel, 1966	Secondary xylem	Late Cretaceous	South Africa	Schultze-Motel, 1966
<i>Protocedroxylon woburnense</i> (Stopes) Seward (Bamford & Corbett, 1994)	Secondary xylem	Early Cretaceous	South Africa	Bamford & Corbett, 1994
<i>Protocedroxylon yezoense</i> Nishida, 1984	Secondary xylem	Cretaceous	Japan	Nishida, 1984
<i>Protocircoporoxylon guyangensis</i> Xu & Zhao, 2024	Secondary xylem	Guyang Fm.; Early Cretaceous	Inner Mongolia, China	Zhao <i>et al.</i> , 2024
<i>Protocircoporoxylon mongolense</i> Ding, Fu, Li & Zhang, 2010	Secondary xylem	Tsagan Tsav Fm.; Early Cretaceous	Ömnögovi Province, Mongolia	Ding <i>et al.</i> , 2010
<i>Protocupressinoxylon</i> sp.	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China; Portugal; Madagascar	Mendes <i>et al.</i> , 2014; Ding <i>et al.</i> , 2022
<i>Protocupressinoxylon coromandelinum</i> Kräusel, 1949	Secondary xylem	Tsagan Tsav Fm.; Early Cretaceous	Ömnögovi Province, Mongolia	Ding <i>et al.</i> , 2010
<i>Protocupressinoxylon</i> cf. <i>purbeckensis</i> Francis, Bamford & Corbett, 1994	Secondary xylem	Cretaceous	South Africa	Bamford & Corbett, 1994
<i>Protocupressinoxylon</i> sp. cf. <i>P.</i> <i>dragastani</i> Iamandei & Iamandei, 1999	Secondary xylem	Punta del Barco Fm.; Early Cretaceous	Santa Cruz Province, Argentina	Iamandei & Iamandei, 1999
<i>Protocupressinoxylon mishanense</i> Zheng & Zhang, 1982	Secondary xylem	Chengzihe Fm.; Early Cretaceous	Heilongjiang Province, China; Ömnögovi Province, Mongolia	Zheng & Zhang, 1982
<i>Protoglyptostroboxylon giganteum</i> He, 1995	Secondary xylem	Yimin Fm.; Early Cretaceous	Inner Mongolia, China	He, 1995
<i>Protoglyptostroboxylon yiminense</i> He, 1995	Secondary xylem	Yimin Fm.; Early Cretaceous	Inner Mongolia, China	He, 1995
<i>Protophyllocladoxylon franconicum</i> Ding, 2000	Secondary xylem	Yixian Fm.; Early Cretaceous	Liaoning Province, China; Ömnögovi Province, Mongolia	Ding <i>et al.</i> , 2010
<i>Protophyllocladoxylon haizhouense</i> Ding, 2000	Secondary xylem	Fuxin Fm.; Early Cretaceous	Liaoning Province, China	Ding, 2000
<i>Protophyllocladoxylon jacobusii</i> Vanner, Conran, Larcombe & Lee, 2024	Secondary xylem	Cretaceous	New Zealand	Vanner <i>et al.</i> , 2024
<i>Protophyllocladoxylon leuchsii</i> Kräusel, 1939	Secondary xylem	Late Cretaceous	Egypt	Kräusel, 1939
<i>Protophyllocladoxylon oolithicum</i> Vogellehner, 1966	Secondary xylem	Early Cretaceous	Germany	Vogellehner, 1966
<i>Protophyllocladoxylon owensii</i> Fletcher, Cantrill, Moss & Salisbury, 2014	Secondary xylem	Late Cretaceous	Australia	Fletcher <i>et al.</i> , 2014
<i>Protophyllocladoxylon rosablancaense</i> Pons, 1969	Secondary xylem	Early Cretaceous	Columbia; Peru	Pons, 1969

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TABLE 1 (Continued)

Species	Preservation status	Horizon and age	Locality	References
<i>Protophyllocladoxylon xalucense</i> Boura & Pons, 2013	Secondary xylem	Early Cretaceous	Vietnam	Boura & Pons, 2013
<i>Protopiceoxylon</i> sp.	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China; UK	Stopes, 1915; Ding <i>et al.</i> , 2022
<i>Protopiceoxylon amurense</i> Du, 1982	Secondary xylem	Jiameng Gr.; Late Cretaceous	Heilongjiang Province, China	Du, 1982; Wang <i>et al.</i> , 1997
<i>Protopiceoxylon chaoyangense</i> Duan, 2000	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China	Duan, 2000
<i>Protopiceoxylon edwardsi</i> Stopes, 1915	Secondary xylem	Early Cretaceous	Lower Greensands of Sussex	Stopes, 1915
<i>Protopiceoxylon extinctum</i> Gothan, 1907	Secondary xylem	Early Cretaceous	Spitzbergen, Norway, Canada	Gothan, 1907
<i>Protopiceoxylon dacotense</i> (Knowlton) Read, 1932	Secondary xylem	Late Cretaceous	Dakota, USA	Read, 1932
<i>Protopiceoxylon dakotense</i> Sze, 1963	Secondary xylem	Daming Gr.; Early Cretaceous	Liaoning Province, China	Sze & Lee, 1963
<i>Protopiceoxylon mohense</i> Ding, 2000	Secondary xylem	Jiufengshan Fm.; Early Cretaceous	Heilongjiang Province, China	Gothan, 1907; Sze & Lee, 1963
<i>Protopiceoxylon yizhouense</i> Duan & Cui, 1995	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China	Duan <i>et al.</i> , 1995
<i>Protopodocarpoxyton araucarioides</i> Müller-Stoll & Schultze-Motel, 1989	Secondary xylem	Early Cretaceous	Westfalen, Germany	Müller-Stoll & Schultze-Motel, 1989
<i>Protopodocarpoxyton arnatum</i> Zheng & Zhang, 1982	Secondary xylem	Huashan Gr.; Late Cretaceous	Heilongjiang Province, China	Zheng & Zhang, 1982
<i>Protopodocarpoxyton dantzii</i> Dupéron-Laudoueneix & Dupéron, 1995	Secondary xylem	Cretaceous	Chad; Cameroon	Dupéron-Laudoueneix & Dupéron, 1995 Philippe <i>et al.</i> , 2004a, b
<i>Protopodocarpoxyton dantzii</i> Attims, 1965	Secondary xylem	Late Cretaceous	Chad; Morocco	Attims, 1965
<i>Protopodocarpoxyton jingangshanense</i> Ding, 2000	Secondary xylem	Yixian Fm.; Early Cretaceous	Liaoning Province, China	Ding, 2000
<i>Protopodocarpoxyton lalongense</i> Vozenin-Serra & Pons, 1990	Secondary xylem	Early Cretaceous	Lhasa, Tibet, China	Vozenin-Serra & Pons, 1990
<i>Protopodocarpoxyton orientale</i> Vozenin-Serra & Pons, 1990	Secondary xylem	Early Cretaceous	Lhasa, Tibet, China	Vozenin-Serra & Pons, 1990
<i>Protopodocarpoxyton quinhonense</i> Serra, 1971	Secondary xylem	Cretaceous	Vietnam	Serra, 1971
<i>Protopodocarpoxyton rochii</i> Boureau, 1952	Secondary xylem	Cretaceous	Chad	Boureau, 1952
<i>Protopodocarpoxyton subdantzii</i> Gazeau & Koeniguer, 1970	Secondary xylem	Cretaceous	Chad	Gazeau & Koeniguer, 1970; Philippe <i>et al.</i> , 2004a, b
<i>Protopodocarpoxyton rochii</i> Boureau, 1957	Secondary xylem	Cretaceous	Chad	Boureau, 1957; Philippe <i>et al.</i> , 2004a, b
<i>Protopodocarpoxyton teixeirae</i> Boureau, 1957	Secondary xylem	Early Cretaceous	Tunisia	Boureau, 1957
<i>Protosciadopityoxylon liaoningense</i> Zhang, Zheng & Ding, 1999	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China	Zhang <i>et al.</i> , 1999
<i>Rhizocupressinoxylon liasinum</i> Lignier, 1907	Secondary xylem	Cretaceous	France	Lignier, 1907; Philippe <i>et al.</i> , 2018

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TABLE 1 (Continued)

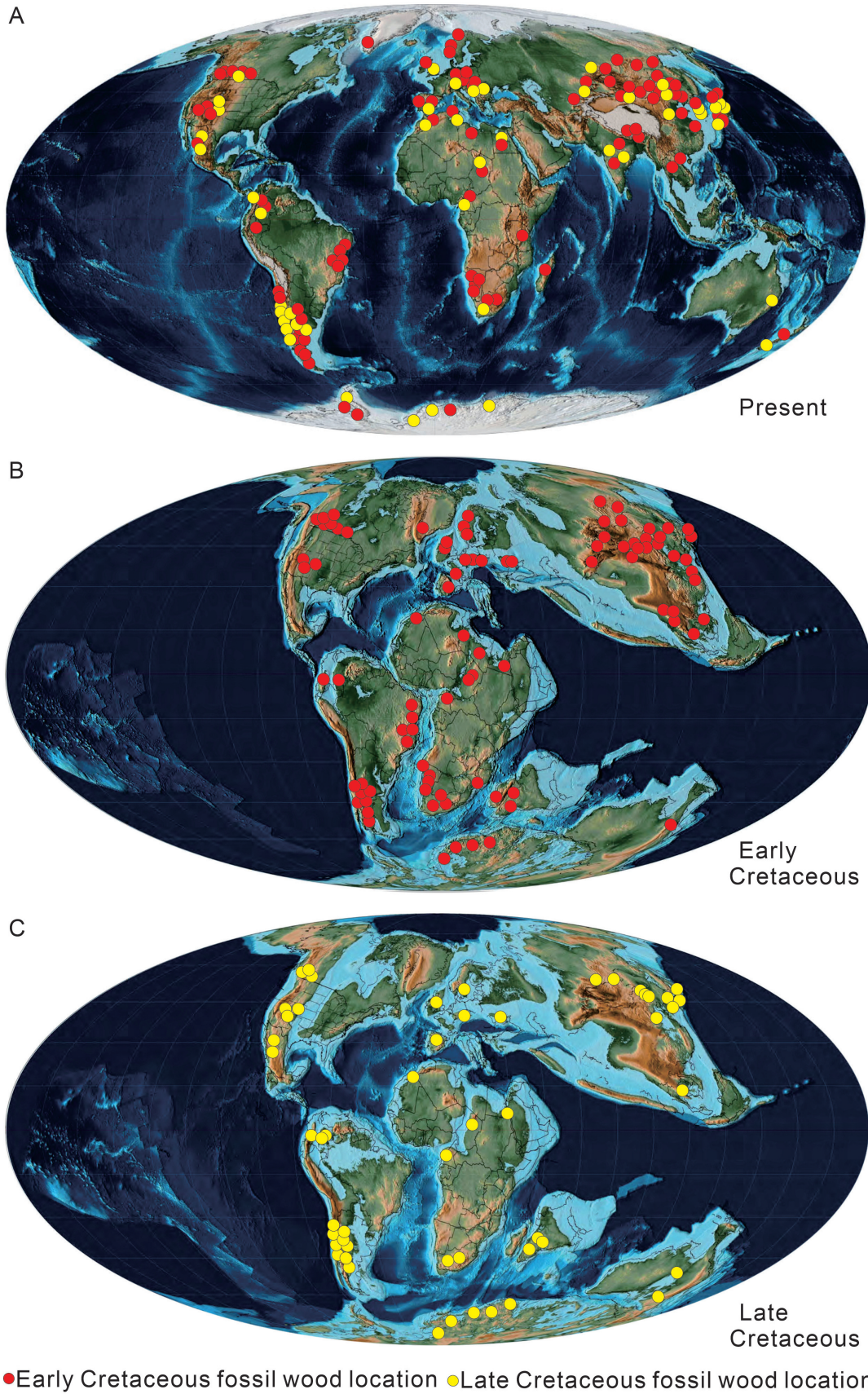
Species	Preservation status	Horizon and age	Locality	References
<i>Sahnioxylon andrewsii</i> Bose & Sah, 1954	Pith, primary xylem, secondary xylem	Late Cretaceous	Rajmahal, India	Bose & Sah, 1954
<i>Sahnioxylon antarcticum</i> Lemoigne & Torres, 1988	Pith, primary xylem, secondary xylem	Late Cretaceous	Antarctica	Lemoigne & Torres, 1988
<i>Sahnioxylon scalariforme</i> Shilkina, 1960	Pith, primary xylem, secondary xylem	Early Cretaceous	Russia	Shilkina, 1960
<i>Saxicaulis meckertii</i> Jud, Rothwell & Stockey, 2010	Pith, Primary xylem, Secondary xylem	Late Cretaceous	Vancouver Island, UK Columbia, Canada	Jud <i>et al.</i> , 2010
<i>Sciadopityoxylon heizyoense</i> (Shimakura) Zhang & Zheng, 2000	Secondary xylem	Yimin Fm.; Early Cretaceous	Inner Mongolia, China	Zhang & Zheng, 2000b
<i>Sciadopityoxylon liaoningense</i> Ding, 2016	Secondary xylem	Fuxin Fm.; Early Cretaceous	Liaoning Province, China	Ding <i>et al.</i> , 2016
<i>Sequoioxylon zhangii</i> Tian, Wang & Philippe, 2018	Secondary xylem	Quantou Fm.; Mingshui Fm.; Late Cretaceous	Heilongjiang Province, China	Tian <i>et al.</i> , 2018
<i>Shimakuroxylon japonicum</i> (Shimakura) Philippe, Boura, Oh & Pons, 2014	Secondary xylem	Laocun Fm.; Early Cretaceous	Zhejiang Province, China	Philippe <i>et al.</i> , 2014; Chen <i>et al.</i> , 2024
<i>Solenoxylon wissi</i> Kräusel, 1956	Secondary xylem	Early Cretaceous	Namibia	Kräusel, 1956
<i>Solenoxylon kurzi</i> Kräusel, 1956	Secondary xylem	Early Cretaceous	Namibia	Kräusel, 1956
<i>Taxaceoxylon japonomesozoicum</i> Nishida, 1973	Secondary xylem	Cretaceous	Japan	Nishida, 1973
<i>Taxaceoxylon jarmolenkoi</i> Shilkina, 1989	Secondary xylem	Early Cretaceous	Russia	Shilkina, 1989
<i>Taxaceoxylon rajmahalense</i> Kräusel & Jain, 1964	Secondary xylem	Early Cretaceous	Canada	Kräusel & Jain, 1964
<i>Taxaceoxylon saghalienense</i> Nishida, 1986	Secondary xylem	Late Cretaceous	Japan	Nishida, 1986
<i>Taxodioxylon</i> sp.	Secondary xylem	Early Cretaceous	Heilongjiang Province, China; Antarctica; Canada	Falcon-Lang & Cantrill, 2000; Cheng <i>et al.</i> , 2023; Vanner <i>et al.</i> , 2024
<i>Taxodioxylon albertense</i> Shimakura, 1937	Secondary xylem	Changcai Fm, Yingcheng Fm.; Dadaepo Fm.; Early–Late Cretaceous	Jilin Province, China; South Korea; Japan; Canada	Shimakura, 1937
<i>Taxodioxylon anglicum</i> Stopes, 1915	Secondary xylem	Cretaceous	UK	Stopes, 1915
<i>Taxodioxylon cryptomerioides</i> Du, 1982	Secondary xylem	Jiameng Gr.; Late Cretaceous	Heilongjiang Province, China	Du, 1982
<i>Taxodioxylon compressum</i> Ogura, 1944	Secondary xylem	Late Cretaceous	Japan	Ogura, 1944
<i>Taxodioxylon goeppertii</i> Hartig, 1848	Secondary xylem	Early Cretaceous	Canada	Hartig, 1848
<i>Taxodioxylon gypsaceum</i> Meijer, 2000	Secondary xylem	Aachen Fm.; Late Cretaceous	Belgium; Canada	Meijer, 2000
<i>Taxodioxylon heichengziense</i> Tian, Wang, Zhang & Zheng, 2016	Secondary xylem	Yixian Fm.; Early Cretaceous.	Liaoning Province, China	Ding <i>et al.</i> , 2016
<i>Taxodioxylon nihongii</i> Nishida, 1986	Secondary xylem	Late Cretaceous	Japan	Nishida, 1986
<i>Taxodioxylon pseudoalbertese</i> Nishida & Nishida, 1986	Secondary xylem	Changcai Fm, Yingcheng Fm.; Early Cretaceous	Jilin Province, China; Japan	Nishida & Nishida, 1986

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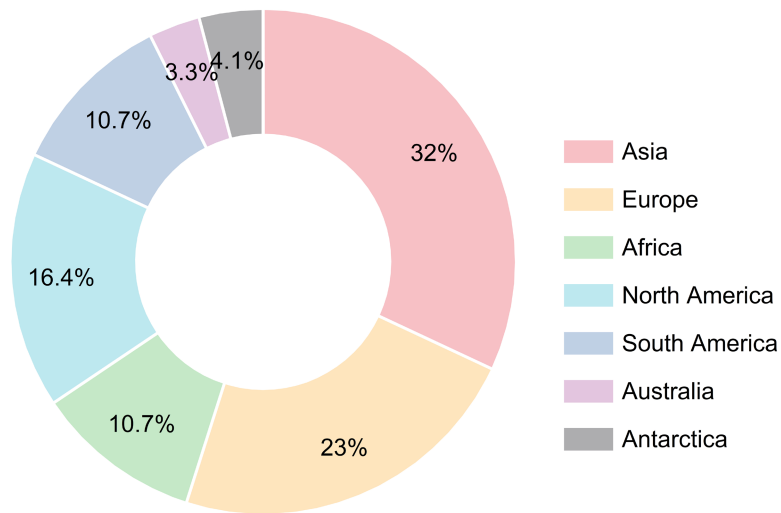
TABLE 1 (Continued)

Species	Preservation status	Horizon and age	Locality	References
<i>Taxodioxylon szei</i> Yang & Zheng, 2003	Secondary xylem	Muleng Fm.; Early Cretaceous	Heilongjiang Province, China	Yang & Zheng, 2003
<i>Taxodioxylon taxodii</i> Gothan, 1905	Secondary xylem	Late Cretaceous	Japan	Ogura, 1944
<i>Taxoxylon liaoxiense</i> Duan, 2000	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China	Duan, 2000
<i>Taxoxylon pulchrum</i> He, 1995	Secondary xylem	Yimin Fm.; Early Cretaceous	Inner Mongolia, China	He, 1995
<i>Telephragmoxylon transsylvanicum</i> Iamandei, 2005	Secondary xylem	Cretaceous	Romania	Iamandei <i>et al.</i> , 2005
<i>Thujoxylon beipiaoense</i> Tian, Wang, Zhang & Zheng, 2016	Secondary xylem	Yixian Fm.; Early Cretaceous.	Liaoning Province, China	Ding <i>et al.</i> , 2016
<i>Xenoxylon</i> sp.	Secondary xylem	Early Cretaceous	Heilongjiang Province, China	Cheng <i>et al.</i> , 2023
<i>Xenoxylon conchylanium</i> Fliche, 1910	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China	Wu <i>et al.</i> , 2021
<i>Xenoxylon fuxinense</i> Ding, 2000	Secondary xylem	Fuxin Fm.; Early Cretaceous	Liaoning Province, China	Ding, 2000
<i>Xenoxylon hopeiense</i> Chang, 1929	Secondary xylem	Fuxin Fm.; Early Cretaceous	Liaoning Province, China; Russia	Ding, 2000
<i>Xenoxylon huolinense</i> Ding, 2000	Secondary xylem	Huolinhe Fm.; Early Cretaceous	Inner Mongolia, China	Ding, 2000
<i>Xenoxylon jakutiense</i> Shilkina, 1986	Secondary xylem	Early Cretaceous	Russia	Shilkina, 1986
<i>Xenoxylon japonicum</i> Vogelleher, 1968	Secondary xylem	Early Cretaceous	Japan	Vogelleher, 1968
<i>Xenoxylon jurassicum</i> Kräusel, 1922	Secondary xylem	Early Cretaceous	Russia	Nastchokin, 1968
<i>Xenoxylon kazuoense</i> Xie, Wang, Tian & Uhl, 2024	Secondary xylem	Jiufotang Fm.; Early Cretaceous	Liaoning Province, China	Xie <i>et al.</i> , 2024
<i>Xenoxylon latiporosum</i> (Cramer) Ding, 2000	Secondary xylem	Yixian Fm., Taipinglingchang Fm.; Tsagan Tsav Fm.; Early Cretaceous	Liaoning, Heilongjiang Province, China; Canada; Ömnögovi Province, Mongolia; Japan; Russia; USA	Ding <i>et al.</i> , 2010
<i>Xenoxylon liaoningense</i> Duan, 1995	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China	Duan, 1995
<i>Xenoxylon meisteri</i> Palibin & Jarmolenko, 1932	Secondary xylem	Hailing Fm.; Late Cretaceous	Heilongjiang Province, China; Russia	Palibin & Jarmolenko, 1932
<i>Xenoxylon peidense</i> Zheng & Zhang, 1982	Secondary xylem	Huolinhe Fm., Yunshan Fm.; Early Cretaceous	Heilongjiang Province, Inner Mongolia, China	Zheng & Zhang, 1982
<i>Xenoxylon saadawii</i> Youssef, 2002	Secondary xylem	Early Cretaceous	Egypt	Youssef, 2002
<i>Xenoxylon tsuruokae</i> Nishida, 1993	Secondary xylem	Cretaceous	Japan	Nishida, 1993
<i>Xenoxylon watarianum</i> Nishida & Nishida, 1986	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China; Japan; Russia	Nishida & Nishida, 1986; Wu <i>et al.</i> , 2021
<i>Xenoxylon yixianense</i> Zhang & Shang, 1996	Secondary xylem	Shahai Fm.; Early Cretaceous	Liaoning Province, China	Zhang & Shang, 1996

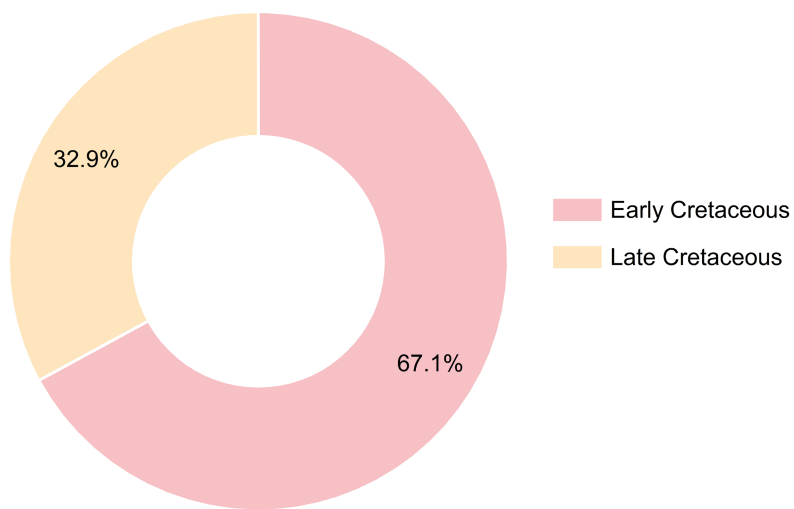
Fm., Formation; Gr., Group.



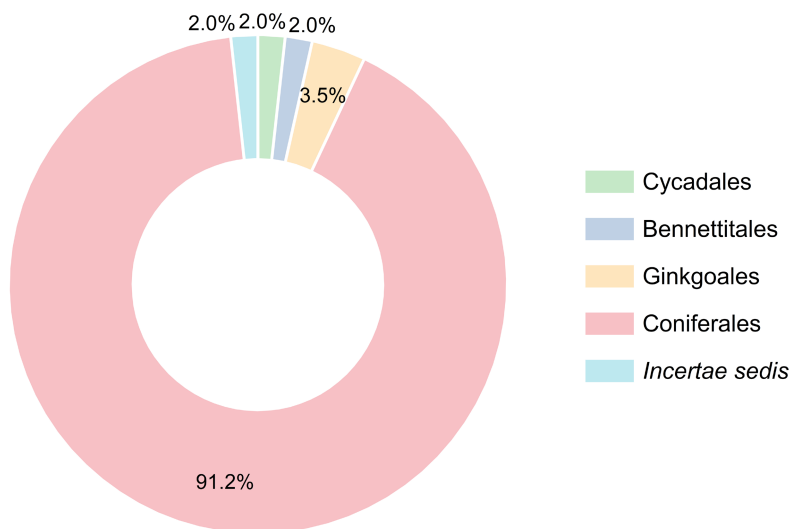
**FIGURE 1.** Geographic and palaeogeographical maps of the Cretaceous gymnospermous wood distribution (palaeomaps from Scotese, 2014a, b). Note: The fossil wood records without accurate age controls (Early/Late Cretaceous) are not shown in the corresponding maps.



**FIGURE 2.** Generic percentage of the Cretaceous gymnospermous wood in seven continents.



**FIGURE 3.** Generic percentage of the Early and Late Cretaceous gymnospermous wood. Note: The fossil wood records without accurate age controls (Early/Late Cretaceous) are not shown herein.



**FIGURE 4.** Generic percentage of the Cretaceous gymnospermous wood of Cycadales, Bennettitales, Ginkgoales, Coniferales, and *incertae sedis*.



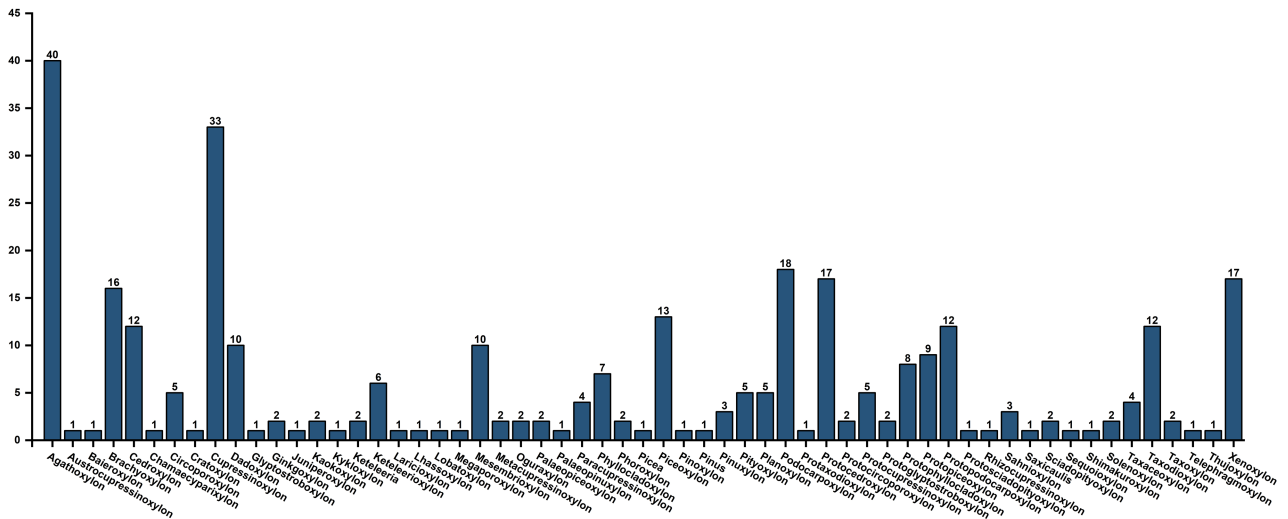


FIGURE 5. Species number of each genus of the Cretaceous gymnospermous wood.

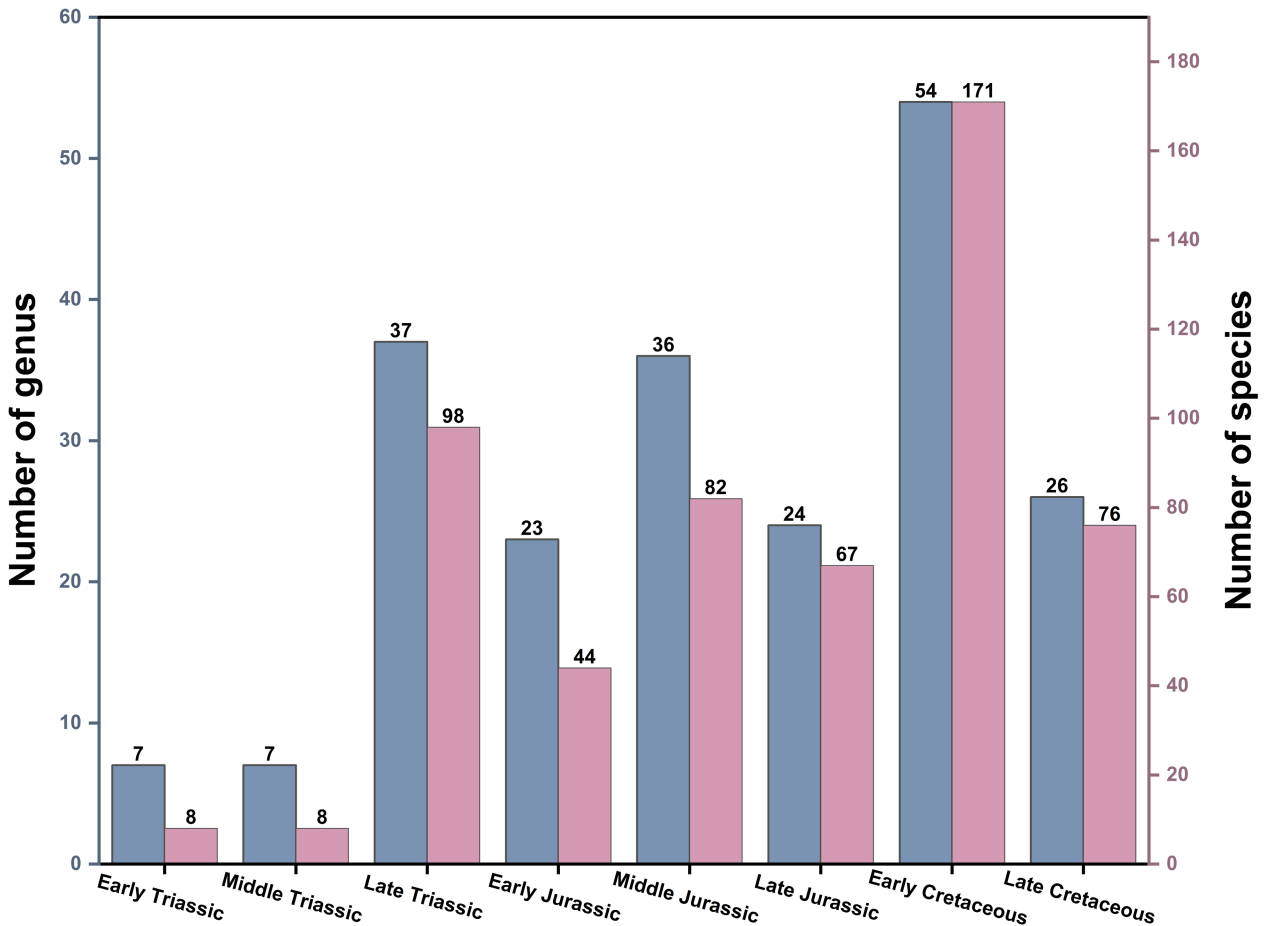


FIGURE 6. Numbers of genus and species of the Mesozoic gymnospermous wood.

Greguss 1961, *Brachyoxylon* Hollick & Jeffrey 1909, *Cedroxylon* Gothan 1905, *Cupressinoxylon* Gothan 1905, *Juniperoxylon* Kräusel 1949, *Phyllocladoxylon* Gothan 1905, *Planoxylon* Stopes 1916, *Podocarpoxylon* Gothan 1905, *Protocedroxylon* Gothan 1910, *Protocircoporoxylon*

Vogellehner 1967, *Protocupressinoxylon* Eckhold 1922, *Protophyllocladoxylon* Kräusel 1939, *Prototaxoxylon* Kräusel & Dolianiti 1958, *Sahniioxylon* Bose & Sah 1954, *Taxaceoxylon* Kräusel & Jain 1964, and *Xenoxylon* Gothan 1905 (Gou & Feng, 2024a, b).

Although the morphology and structure of the pith and the primary xylem play important roles in the classification and identification of fossil gymnospermous woods, most of the fossil-wood specimens from the Cretaceous are only preserved with the secondary xylem. To date, only 6 genera and 11 species of permineralized gymnospermous wood with pith, primary and secondary xylems have been described from the Cretaceous (Table 1).

According to the gymnospermous fossil wood statistical research in the Mesozoic (Gou & Feng, 2024a, b), 7 genera and 8 species were documented from the Lower Triassic, 7 genera and 8 species from the Middle Triassic, and 37 genera and 98 species from the Upper Triassic; 23 genera and 44 species were documented from the Lower Jurassic, 36 genera and 82 species from the Middle Jurassic, and 24 genera and 67 species from the Upper Jurassic; 54 genera and 169 species were documented from the Lower Cretaceous, and 26 genera and 76 species from the Upper Cretaceous (Fig. 6). An analysis of the quantity of gymnosperm fossil wood across the Triassic, Jurassic, and Cretaceous periods indicates a rapid increase in species numbers since the Late Triassic. The entire Jurassic period is characterized by a flourishing stage for gymnosperms, reaching its peak in the Early Cretaceous before experiencing a decline during the Late Cretaceous. This trend may be closely associated with the emergence of angiosperms.

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