

Counting of *Eophyllophyton*'s leaves

Random sampling and statistics based on over 300 leaves indicate that most of the laminate leaves of *Eophyllophyton* are fertile. In the examined area of the bedding surface of several *Eophyllophyton* specimens (totally 200 cm²), there are 286 fertile leaf pairs (or clusters) and only 52 vegetative ones, and assuming that fertile and vegetative leaves have the same rate of preservation, the occurrences of fertile leaves are 5.5 times more than those of vegetative ones (Figure S4; Table S1), indicating that most of the laminate leaves of *Eophyllophyton* are fertile.

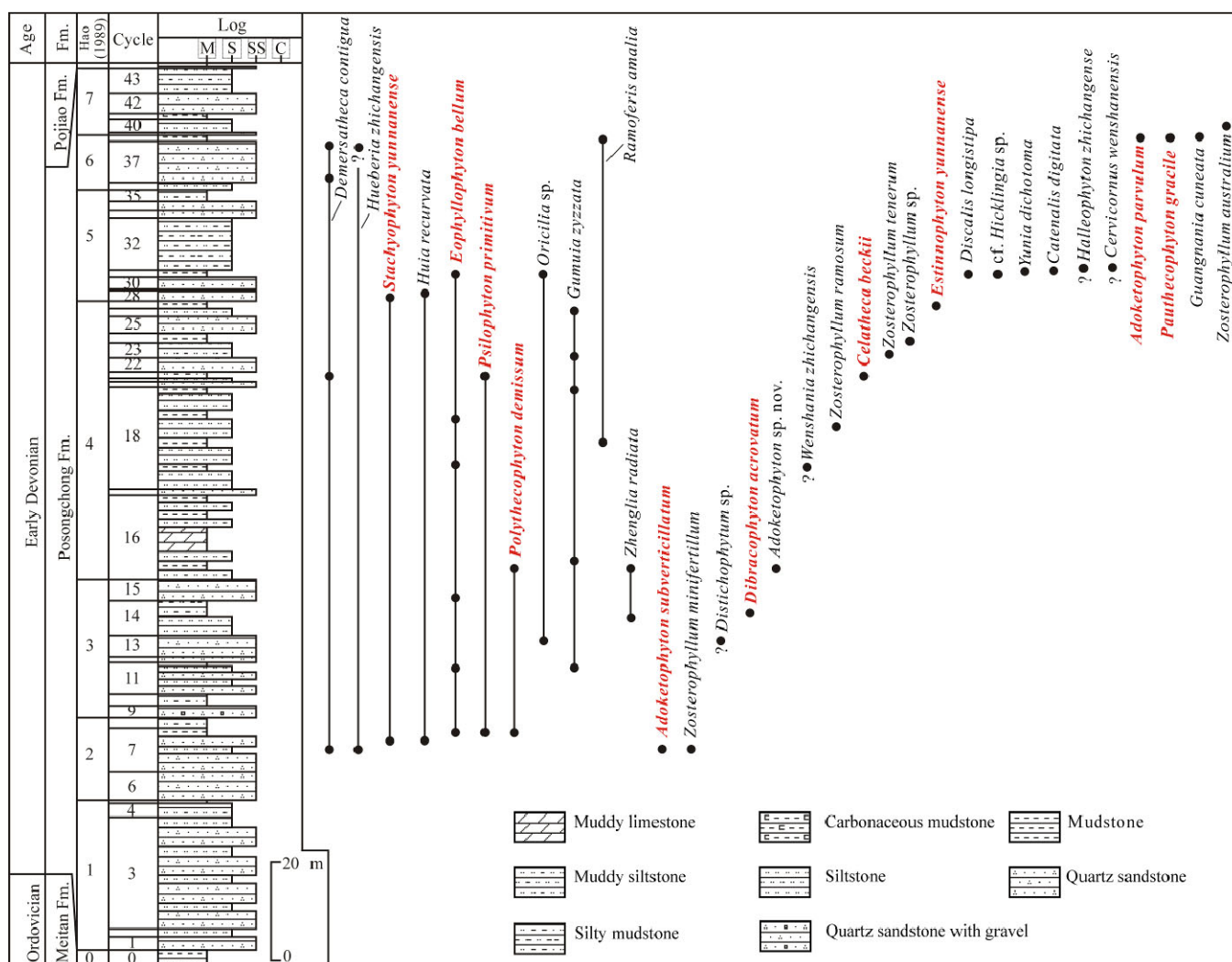


Figure S1 Stratigraphic column of the Posongchong Formation at the Zhichang section shows distribution of fossil plants. Positions of fossil plants are indicated by black circles; question marks indicate uncertain positions. The stratigraphic division follows the theme in Figure 2 of Hao (1989).



Figure S2 *Stachyophyton yunnanense*. (a) Leaf-like branch with distal parts that dichotomize 4-8 times forming terminal branchlets, to which are attached strobili with helically arranged sporophylls (arrow). Scale bar = 8 mm. (b) Lateral vegetative “leaf-like branches”. Scale bar = 15 mm. The specimens are shown in Plate II, Figures 3 and 9 of Geng (1983), deposited at Institute of Botany, Chinese Academy of Sciences.

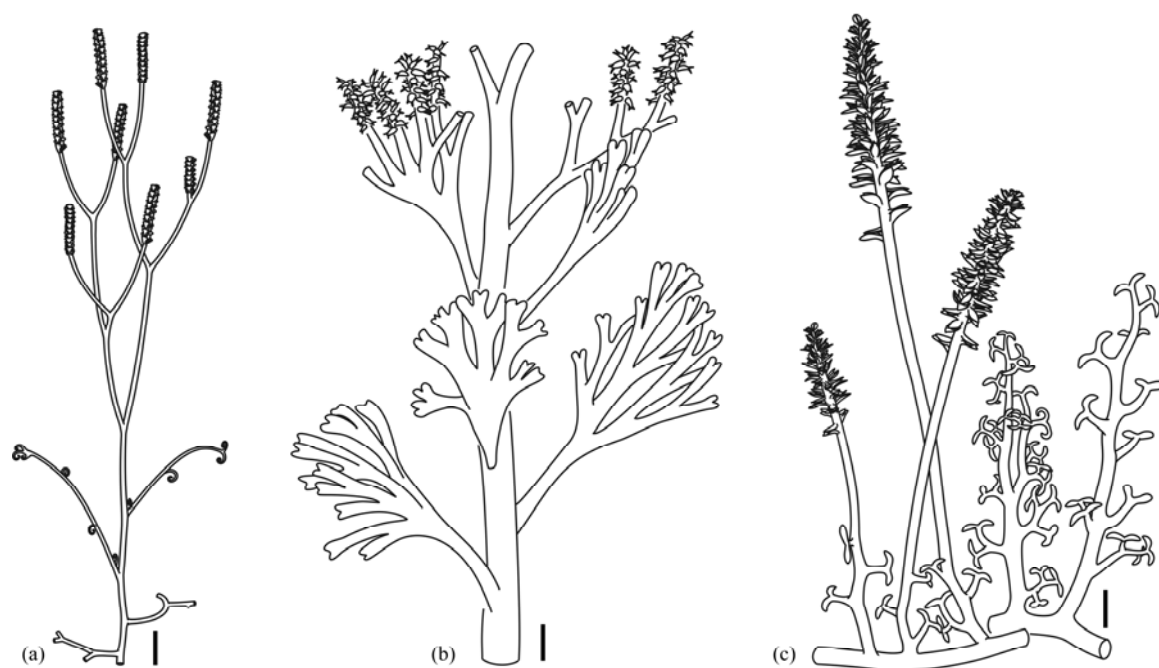


Figure S3 Partial restorations of *Adoketophyton parvulum* (a), *Stachyophyton yunnanense* (b), and *Dibracophyton acrovatum* (c). (a) From Zhu et al. (2011), their Figure 2. (c) From Hao et al. (2012), their Figure 3. Bars: (a), (c) 10 mm; (b) 15 mm.



Figure S4 *Eophyllophyton bellum*. Numerous isolated fertile leaves on the bedding surface. Specimen at the Department of Geology, Peking University, Beijing, PUH.10-Eop.06. Scale bar = 3 mm.

Table S1 Occurrences of fertile and sterile leaves in specimens of *Eophyllophyton bellum*

	Examined area (cm ²)	No. of fertile leaves	No. of sterile leaves
Specimen Eop01	25	54	4
Specimen Eop02	20	40	5
Specimen Eop03	25	43	22
Specimen Eop04	15	14	5
Specimen Eop05	10	22	12
Specimen Eop06	35	24	3
Specimen Eop07	70	89	1
Total	200	286	52

- 1 Geng B Y. *Stachyophyton* gen. nov. discovered from Lower Devonian of Yunnan and its significance (in Chinese). Acta Bot Sin, 1983, 25: 574–579
- 2 Hao S G. A new zosterophyll from the Lower Devonian (Siegenian) of Yunnan, China. Rev Palaeobot Palynol, 1989, 57: 155–171
- 3 Hao S G, Xue J Z, Zhu X, et al. A new genus of Early Devonian plants with novel strobilar structures and vegetative appendages from the Posongchong Formation of Yunnan, China. Rev Palaeobot Palynol, 2012, 171: 73–82
- 4 Zhu X, Xue J Z, Hao S G, et al. A new species of *Adoketophyton* from the Lower Devonian (Pragian) Posongchong Formation of Yunnan, China. Rev Palaeobot Palynol, 2011, 164: 238–246