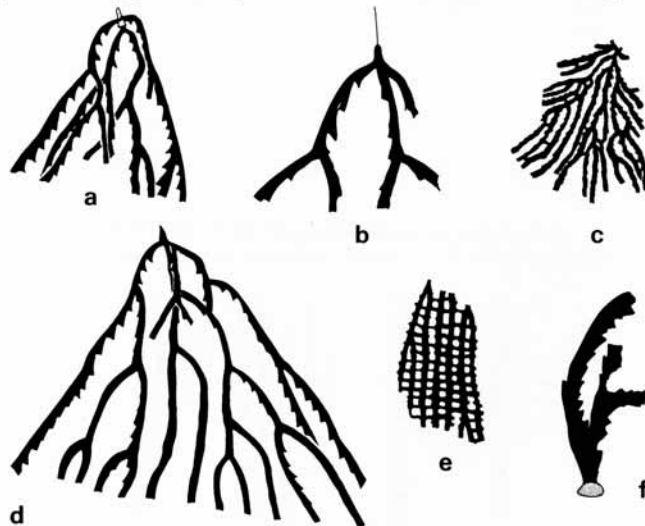


NEW DATA ON TREMADOC GRAPTOLITES FROM YUKON, CANADA

by D. E. JACKSON

ABSTRACT. The Tremadocian subzones of *Staurograptus tenuis*, *Anisograptus richardsoni*, *Clonograptus aureus*, and *Adelograptus antiquus* are given full zonal status in northern Richardson Mountains. *Bryograptus ramosus* Brøgger and a species of *Dictyonema* are described from the upper Tremadoc. The occurrence of *B. ramosus* in the *C. aureus* Zone supports a correlation with shales of 3a β age in Norway.

IN 1974 Jackson presented findings on the sequence of graptolites found in Tremadocian shales on Peel River, Yukon Territory. In addition to simplifying zonal terminology the paper proposed that the *Adelograptus* Zone and the *Staurograptus* Zone each be divided into two subzones. This short paper offers important new data from two river sections in the Richardson Mountains. The Rock River section which lies 100 km north of Peel River demonstrates the usefulness of the Peel River zonal scheme, and the Canyon Creek section 40 km north-west of the Upper Canyon on Peel River provides supplementary data on the faunal content of the upper Tremadoc.



TEXT-FIG. 1a, b, d, *Bryograptus ramosus* Brøgger; a, d, GSC hypotypes 27000 and 27001 respectively, $\times 3$; b, GSC hypotype 27002, $\times 5$; c, *Dictyonema* sp. GSC hypotype 27003 (not described); e, *Dictyonema* cf. *percancellatum* Ruedemann GSC hypotype 27004, $\times 3$; f, ?*Dendrograptus* sp. GSC hypotype 27005 (not described), $\times 3$. All figures are camera lucida drawings.

TABLE 1. Rock River Section (66° 48' N.; 136° 07' W.) measured by geologists of Chevron Standard Ltd., in 1968; field designation ZB-19.

ZONES	Footages above base of measured section
<i>Terragraptus approximatus</i> Nich.	8490
<i>Clonograptus</i> sp. C. Jackson	8310
<i>Dicyonema macgillivrayi</i> T. S. Hall	8250
<i>Dicyonema pulchellum</i> T. S. Hall	8240
<i>Terragraptus</i> sp.	8145
<i>Clonograptus</i> sp. A. Jackson	8125
<i>Adelograptus victoricae</i> (T. S. Hall)	8025
<i>Adelograptus antiquus</i> (T. S. Hall)	7945
<i>Psyraptus lenzi</i> Jackson	7855
<i>Clonograptus</i> sp. indet.	7805
<i>Clonograptus</i> sp. (<i>tenellus</i> type)	7765
? <i>Anisograptus</i> sp.	7760
<i>Anisograptus richardsoni</i> Bulman	7750
<i>Stannograptus tenuis</i> Jackson	7690
Footages above base of measured section	7685

TABLE 2. Canyon Creek Section (66° 10' N.; 136° 05' W.) measured by Dr. B. S. Norford, Geological Survey, Canada, 1963.

Footages above base of section	Geological Survey, Canada locality number
1054.7	53034
862	53032
503-504	53031

Remarks. The four graptolite subzones proposed by Jackson (1974) are recognized at the following levels in the Rock River section: *Adelograptus antiquus* 7805–8310 ft; *Clonograptus aureus* 7760–7765 ft; *Anisograptus richardsoni* 7690–7750(?) ft; and *Staurograptus tenuis* 7685 ft.

In the Canyon Creek section, a limestone breccia at 948–967 ft is correlative with a conglomerate marker horizon in the Upper Canyon on Peel River (Jackson 1974, p. 57). The assemblage from GSC loc. 53031 is probably from the *C. aureus* Zone because adelograptids and *Anisograptus* are absent. The two younger collections probably represent the *Adelograptus antiquus* Zone on the basis of the clonograptid composition.

In conclusion, the occurrence of Jackson's (1974) proposed subzones on Rock River, 100 km north of Peel River, demonstrates that these biostratigraphic units are widely distributed along the Richardson Trough and for this reason are raised to zonal status. The discovery of *Bryograptus ramosus* in the basal upper Tremadoc tends to support the correlation of the *Clonograptus aureus* Zone with shales of 3a β age in Norway.

SYSTEMATIC DESCRIPTIONS

Class GRAPTOLITHINA Bronn, 1849

Order DENDROIDEA Nicholson, 1872

Family DENDROGRAPTIDAE Roemer in Frech, 1897

Genus DICTYONEMA Hall, 1851

Dictyonema cf. *percancelatum* Ruedemann

Text-fig. 1e

cf. *Dictyonema percancelatum* n. sp. Ruedemann 1947, p. 172, pl. 4, figs. 13, 14.

Material. One compressed and fragmented rhabdosome GSC (Geological Survey of Canada) hypotype 27004 from GSC loc. 53032, Canyon Creek, collected by B. S. Norford, 1963.

Description. Rhabdosome fragmented 11 mm long and 10 mm wide. Stipes are 0.3–0.4 mm wide dorsally and number fourteen per cm. Details of thecae not seen. Dissepiments are less robust, 0.4 mm long, number eighteen per cm, and tend to have a common alignment across the entire rhabdosome. The frequency of dissepimental spacing suggests that dissepiments are produced at the level of every autotheca (or bitheca) or at alternate autothecae and bithecae. Intra rhabdosomal spaces tend to be square.

Remarks. The close spacing of stipes and dissepiments makes this a distinctive dendroid. The nearest comparison that I have been able to make is with *D. percancelatum* from St. Pauls Inlet, Newfoundland. Ruedemann's original description merely dated the species as Ordovician. However, published accounts by Kindle and Whittington (1958, p. 327) show that Tremadocian rocks do exist in the area.

Family ANISOGRAPTIDAE Bulman, 1950
Genus BRYOGRAPTUS Lapworth, 1880
Bryograptus ramosus Brøgger, 1882

Text-fig. 1a, b, d

- 1882 *Bryograptus ramosus* Brøgger, p. 37, pl. XII, fig. 21.
non 1894 *Bryograptus ramosus* Brøgger; Marr, p. 125, figs. 1-5.
1925 *Bryograptus ramosus* Brøgger; Monsen, p. 160, pl. 1, fig. 9; text-fig. 3.
1954 *Bryograptus* cf. *ramosus* Brøgger; Bulman, p. 34, pl. 4, fig. 9.
1963 *Bryograptus ramosus* Brøgger; Spjeldnaes, p. 122, pl. XVII, figs. 7-9; text-fig. 1.
1965 *Bryograptus ramosus* Brøgger; Erdtmann, p. 105, pl. 2, fig. 5.
1966 *Bryograptus ramosus* (Brøgger); Szymanski, pp. 50, 59, pl. vi, fig. 9.
1971 *Bryograptus ramosus* Brøgger; Bulman, pp. 365-366, figs. 1e, f, 2c.

Material. Five compressed specimens GSC hypotypes 27000, 27001, and 27002 from GSC loc. 53031, Canyon Creek, collected by B. S. Norford, 1963.

Description. Rhabdosome 21 mm long and 20 mm across distally. Fourteen terminal stipes are produced by dichotomous and ? lateral branching from three primary stipes. Two zones of branching occurs at 3.0-3.6 mm and 6.6-9.0 mm from sicula. Sicula 1.3 mm long furnished with a fine nema. Two primary stipes have three thecae and the third stipe has one theca, these stipes diverge from sicula at about 60-80° then curve rapidly inwards to become sub-parallel. Stipes have a maximum dorso-ventral width of 0.6-0.7 mm across thecal aperture and 0.4-0.5 mm just above the aperture; free ventral wall of thecae are concave and inclined at 30-40° near aperture. Autothecae number 16-20 per cm, bithecae not seen.

Remarks. *Bryograptus ramosus* differs from *B. kjerulfi* in having more widely spaced zones of dichotomy and closer spacing of autothecae.

It is distinct from *B. broeggeri* Monsen which has more widely dispersed zones of branching and a characteristically long and slender sicula.

In Scandinavia, this species is characteristic of the lower part of 3a β (Monsen 1925) and according to Erdtmann (1965) ranges upwards into 3a γ beds. Similarly, Szymanski (1966) recorded it from upper Tremadoc of Bialowieza, Poland. The assemblage from GSC loc. 53032 possibly should be assigned to the *C. aureus* Zone on account of its position relative to the conglomerate marker and because of the lack of adelograptids.

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