

SUPPLEMENTARY MATERIAL for:

Ediacara growing pains: Modular addition and development in *Dickinsonia costata*

by: Scott D. Evans, James G. Gehling, Douglas H. Erwin, and Mary L. Droser

Supplementary Figures S1-9

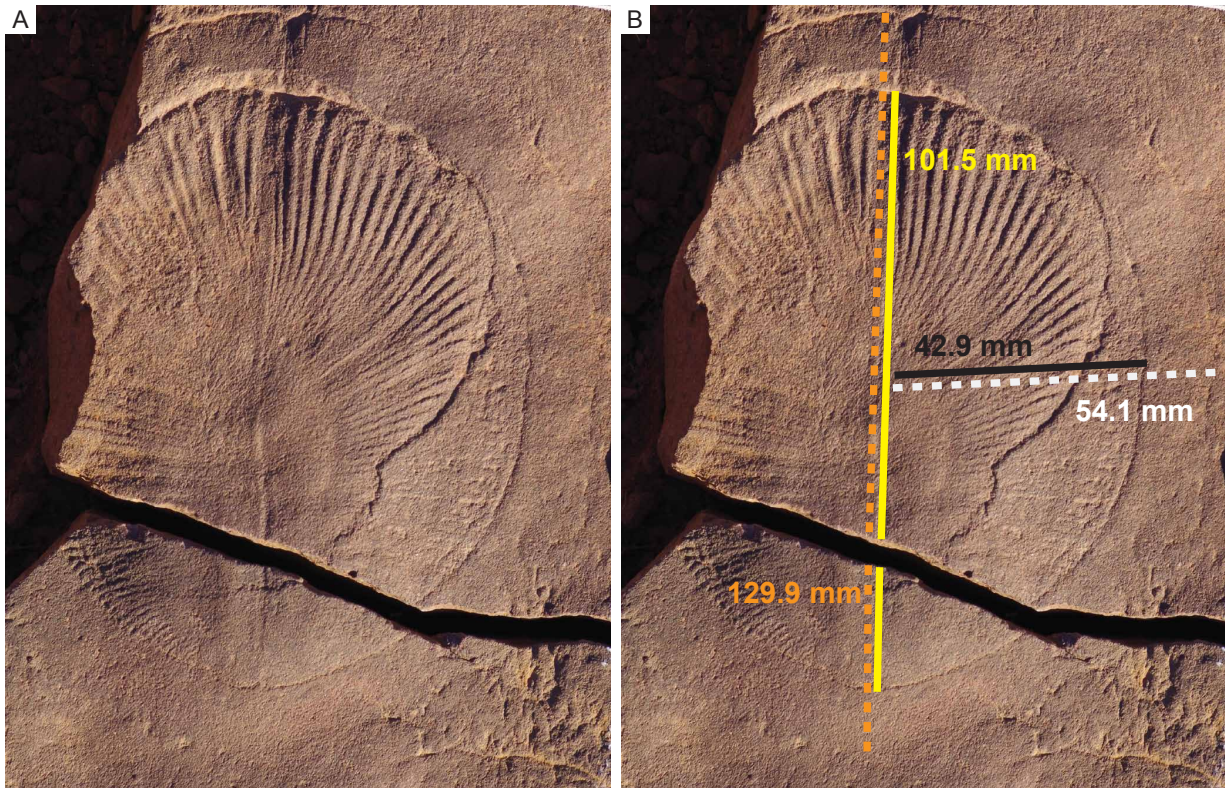


Figure S1. TB-ARB 740s 406e surrounded by contraction rim.



Figure S2. TB-ARB 294s 86e, measuring 54.3 mm in total length and 51.0 mm in total width.

Scale bar 10 mm.

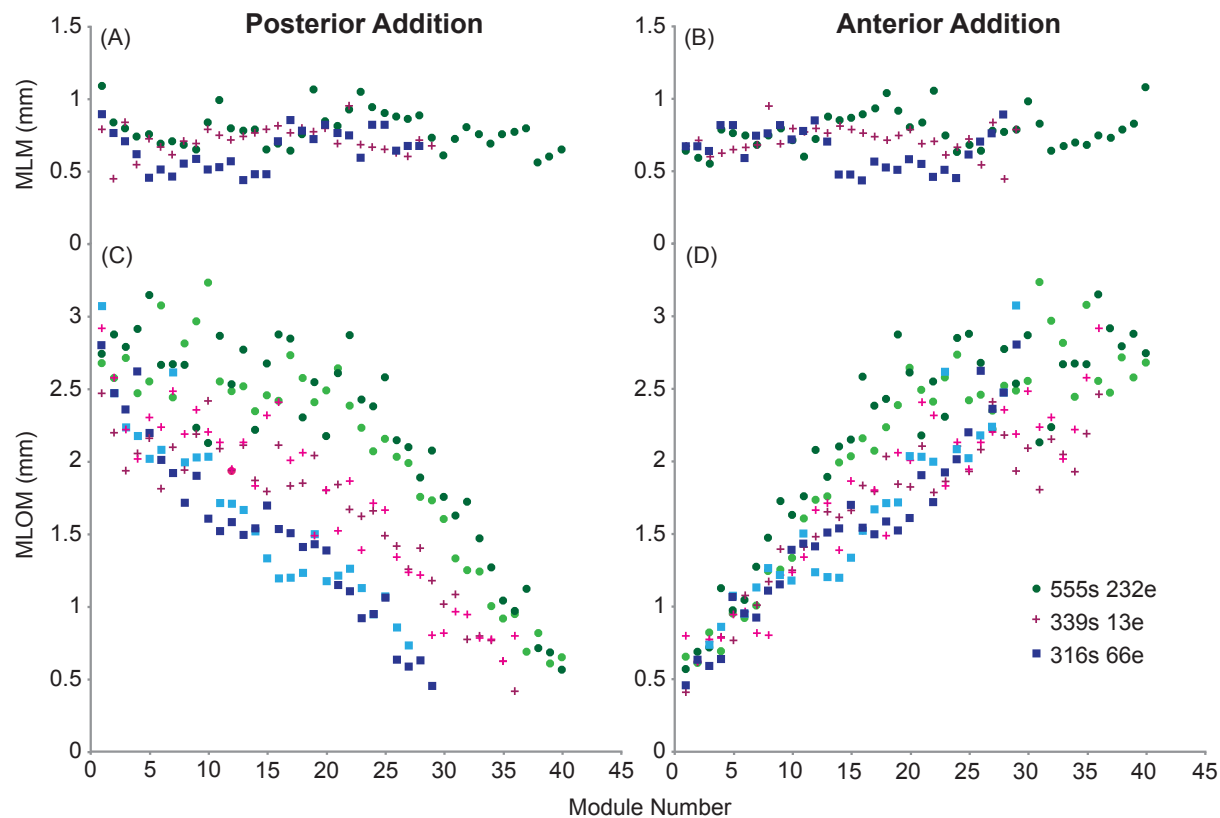


Figure S3. Module length at the midline (A, B) and outer margin (C, D) plotted versus module number for three representative specimens from TB-ARB. Compare models assuming posterior addition (A, C) with those assuming anterior addition (B, D).

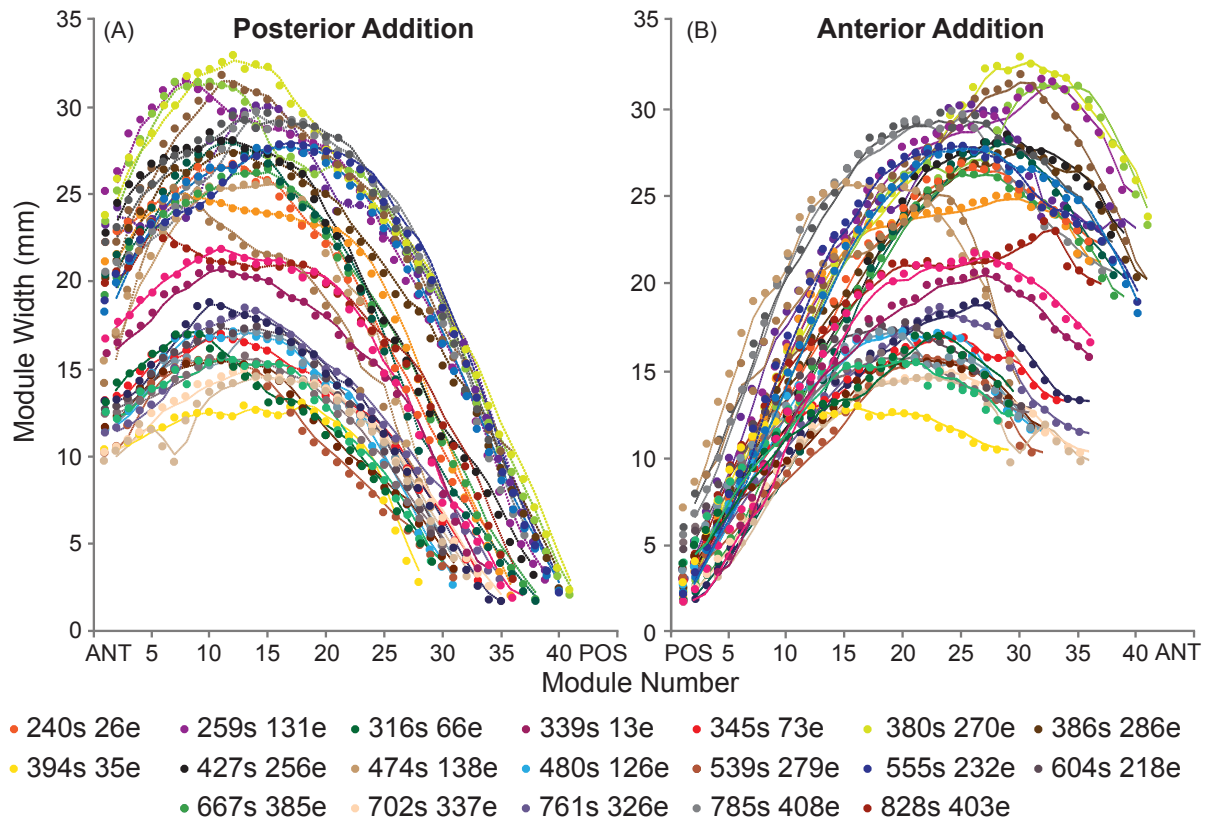


Figure S4. Module width versus module number for all specimens on TB-ARB in which this could be reliably measured in >90% of the inferred total modules assuming (A) posterior or (b) anterior addition. Numbers in the legend represent relative south and east coordinates for each specimen on TB-ARB.

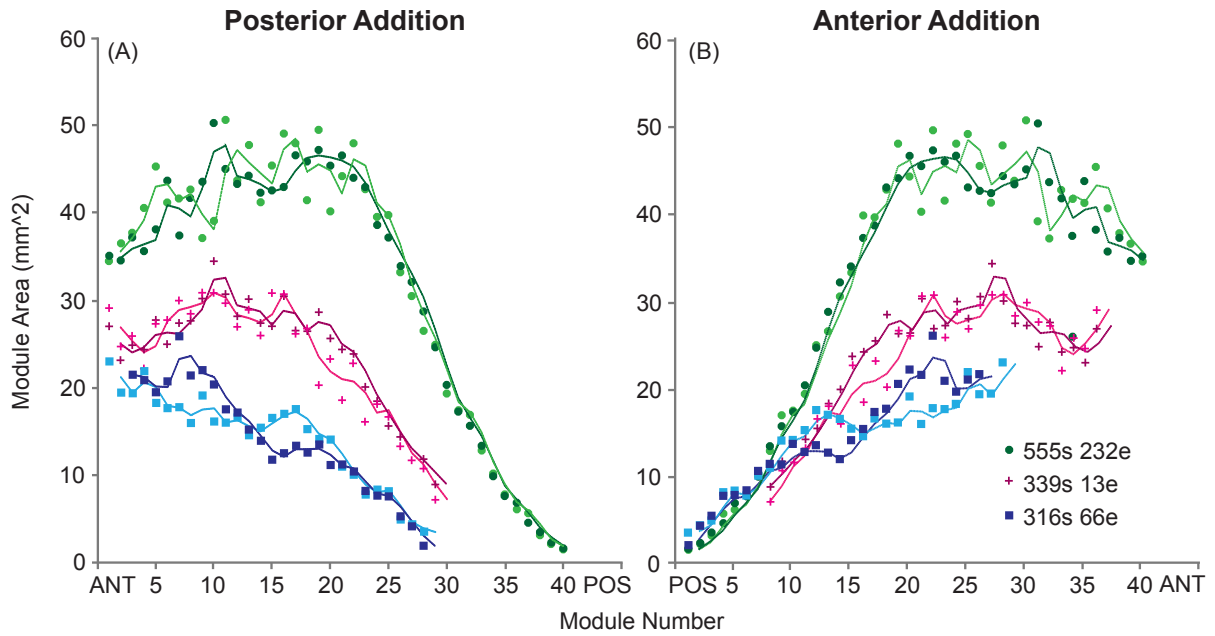


Figure S5. Module area versus module number for three representative specimens from TB-ARB assuming (A) posterior or (B) anterior addition. Trend lines are two point running averages.

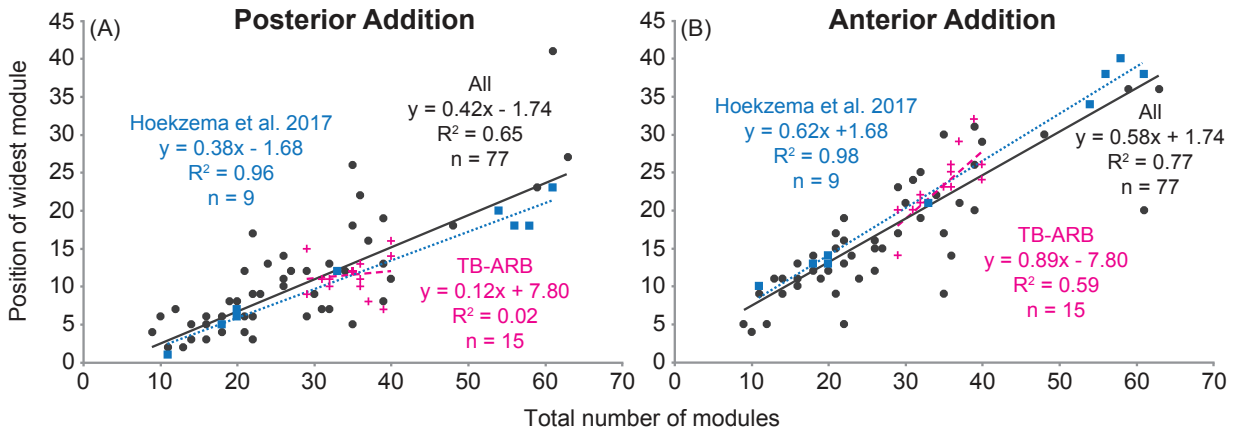


Figure S6. Comparison of the position of the widest module relative to total length from the (A) anterior (i.e. posterior addition) and (B) posterior (i.e. anterior addition) for specimens from TB-ARB (magenta plus signs), Hoekzema et al. 2017 (blue squares) and all other *D. costata* from the Ediacara Member (grey circles). Grey trend line includes data from TB-ARB and Hoekzema et al. 2017 specimens.

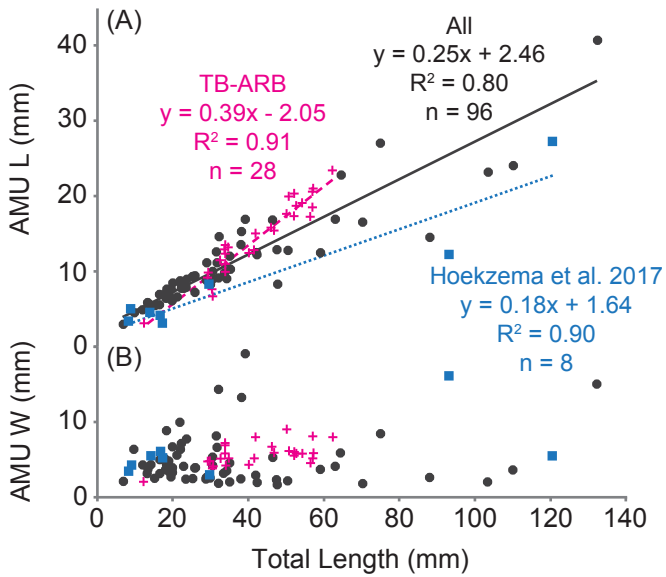


Figure S7. Comparison of total length with (A) the length of the AMU and (B) the width of the AMU for specimens from TB-ARB (magenta plus signs), Hoekzema et al. 2017 (blue squares) and all other *D. costata* from the Ediacara Member (grey circles). Grey trend line includes data from TB-ARB and Hoekzema et al. 2017 specimens.

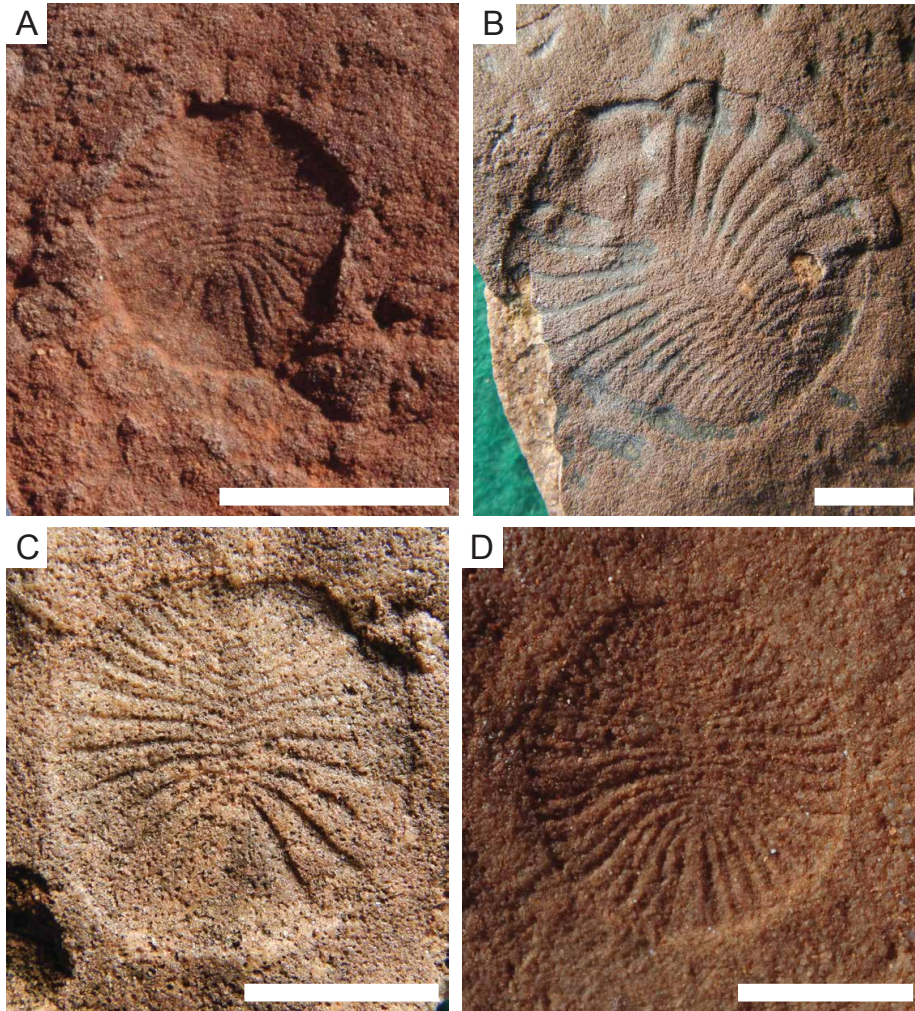


Figure S8. *Dickinsonia costata* exhibiting variable length and module numbers, including two specimens with eighteen modules with total lengths of 12.27 mm (A) and 39.23 mm (B). Notice the contraction rim around (B) indicating that in life this difference may have been even greater. Two specimens with similar lengths, 18.79 mm (C) and 19.33 mm (D), despite total module counts varying from 14 (C) to 25 (D). Specimens (A) N09-17; (B) P12776; (C) RU 2; (D) MM3 369s 135e. Scale bars 10 mm.

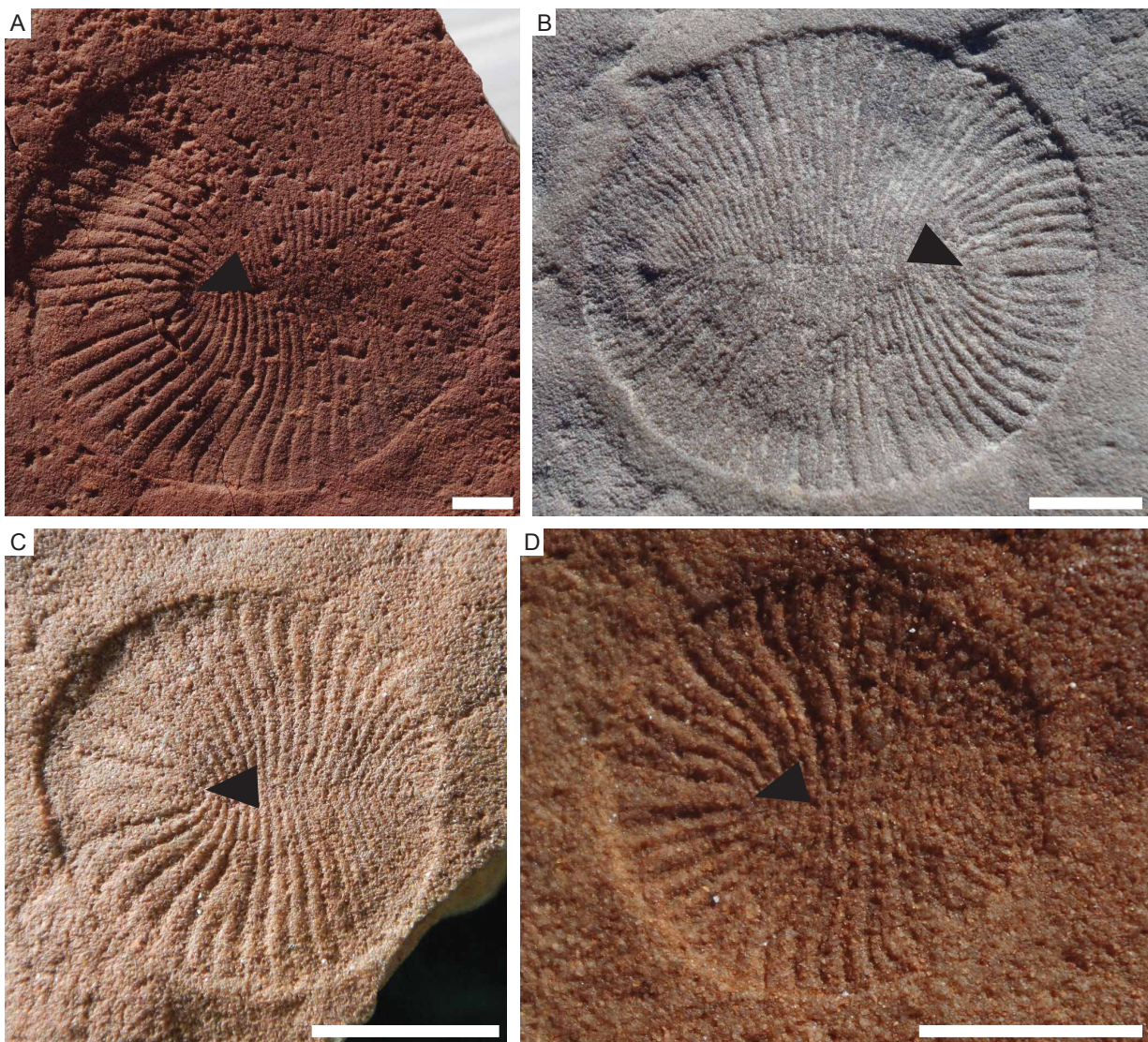


Figure S9. *Dickinsonia costata* specimens from Evans et al., 2017 their figure 1 in different lighting to highlight that the anterior most modules (black triangles) are continuous. Specimens (A) P53893; (B) 1T-F 820s 680e; (C) SAM P41202; (D) MM3 369s 135e. Scale bars 10 mm.