**Supplementary Material**

***Geological Magazine*,** Ediacaran algal cysts from the Doushantuo Formation, South China,byMałgorzata Moczydłowska and Pengju Liu. **Supplementary Material**

**Supplementary Material**

**Details for Figure caption Fig. 5 in the text**

**Figure 5**. Schematic comparative morphology of studied microfossils, reproductive cysts with offspring cells in Chloroplastida (green algae), and embryology of Holozoa, including eggs, developing embryos and diapause cysts. (a–e) Microfossils with processes- and external membranes-bearing (m) cyst-like vesicles containing endocyst (en) inside vesicle cavity and internal spheroidal cells of equal sizes and tightly clustered, numbering from 4 (Fig. 2a) to numerous to hundreds (*T. spinosa*) seen in vesicle sections. (a) *Appendisphaera grandis*. (b) *Mengeosphaera bellula*. (c) *Tanarium paucispinosum*. (d) *Urasphaera fungiformis*. (e) *Tianzhushania spinosa*. (f–j) Examples of reproductive cysts in the group Chloroplastida (classification by Adl *et al*. 2019), showing morphologic pattern of overall shape and characteristic processes, external membranes (m), rod-like elements supporting membrane (r), excystment structure (ex), and endocysts (en), and containing palintomically dividing offspring cells (in green colour). (f) *Pterosperma moebii* phycoma with broad equatorial membranous wall supported by thickened rods. (g–j) Zygotic cysts with a few to numerous dividing cells depending on the progressing developmental stages. (g) *Staurastrum orbiculare*. (h) *Staurodesmus dejectus*. (i, j) *Micrasterias papillifera* mature cyst (i) and early cyst with initial processes and surrounded by membrane, and containing zygote (j). (k–w) Embryos, diapause cysts and eggs of representative organisms from the Supergroup Holozoa, including protistan (unicellular) and metazoan (multicellular) holozoans (classification by Adl *et al*. 2019). (k) Protistan Choanoflagellata, *Codosiga botrytis*, stalked (s) cell with flagellum (f) and collar (c) and cyst (cy) that contains dividing cells and releases many small flagellated cells (after Leadbeater, 2015). (l–w) Metazoan holozoans. (l) Ctenophora, *Mnemiopsis leidyi*, 16-cell-stage embryo with blastomeres differentiating into macromeres (mc, in orange colour) and micromeres (mm, in red colour; colours for this and following drawings) (Gilbert & Raunio, 1997). (m) Porifera, *Ascandra falcata*, coeloblastula with blastocoel (b) (right image) and settled stereoblastula (left image) (Gilbert & Raunio, 1997). (n) Cnidaria, *Hydra vulgaris*, blastula with blastocoel (Gilbert & Raunio, 1997). (o) Nematoda, *Caenorhabdis elegans*, early blastula (upper image) and after 16-cell-stage with orientation of cell division and the asymmetric axis (lower image) (Shilo, 2014). (p) Tardigrada, *Hypsobius dujardini*, cleavage at 16-cell-stage with blastocoel (lower image; Levin *et al*. 2016) and egg shell of unidentified tardigrade with spiny surface and multiple cells inside (courtesy Prof. G. Schultz, Humboldt-Universität, Berlin). (q–u) Arthropoda, Crustacea. (q) barnacle *Tetraclita rosea* at 16-cell-stage embryo with blastocoel inside and within fertilized egg membrane (fm) still having yolk (y) and attachment (a) (Gilbert & Raunio, 1997). (r) Mature egg with polygonal surface sculpture of branchiopod *Eulimnadia chaperi* (Rabet, 2010). (s) Cyst ornamented by polygonal ridges and pits of brain shrimp *Branchinella* (Sanoamuang *et al*. 2002). (t) Embryo at 16-cell-stage with differentiated micromeres and macromeres of Amphipoda (Scholtz & Wolff, 2013). (u) Characteristic arthropod blastocyst with blastocoel (Anderson, 1973). (v) Annelida, characteristic annelid embryo at 16-cell-stage with micromeres viewed from the animal pole and macromeres (left) (Gilbert & Raunio, 1997), and polychaete blastula with blastocoel in *Scolopsos* (right) (Anderson, 1973). (w) Echinodermata. Sea urchin *Lytechinus variegatus* at 16-cell-stage embryo with differentiated micro- and macromeres within fertilization envelope (fe) (left) (Gilbert & Raunio, 1997), and starfish embryo at 16-cell-stage within fertilization envelope and showing early blastocoel (right) (Mathews, 1986).

Drawings of individual specimens are not to scale but in gross the diameters are a few tenses micrometers (g–j), tenses to hundreds micrometers (a–e, f), and hundreds micrometers for all others. Green algae drawn from species micrographs (f) due to courtesy of Dr Pavel Škaloud (Charles University, Prague), and (g–j) courtesy of MSc Marien van Westen (University of Groningen).

**Figures S1–S5**. Lithostratigraphic logs of the Ediacaran Doushantuo Formation in the Yangtze Gorges area, South China, in sections with microfossil occurrence and stratigraphic position of studied specimens marked in red colour (modified after Liu, P. & Moczydłowska (2019). For legend and abbreviations see Figure S1 for all figures.

**Figure S1**. Lithostratigraphic succession in the Niuping section with microfossil occurrence and their abundance, and stratigraphic level of illustrated here species.

**Figure S2**. Lithostratigraphic succession in the Wangfenggang section with microfossil occurrence and their abundance, and stratigraphic level of illustrated here species.

**Figure S3**. Lithostratigraphic succession in the northern Xiaofenghe section with microfossil occurrence and their abundance, and stratigraphic level of illustrated here species.

**Figure S4**. Lithostratigraphic succession in the Dinshuiyan section with microfossil occurrence and their abundance, and stratigraphic level of illustrated here species.

**Figure S5**. Lithostratigraphic succession in the Liuhuiwan section with microfossil occurrence and their abundance, and stratigraphic level of illustrated here species.

**Figure S6.** Erratum to Figure 6 in Shang *et al*. 2018: Fig. 6. Photomicrographs and Raman spectra of *Appendisphaera tenuis*, thin section CJ134.5–5 (F27/3). (A–C) Transmitted light images. (B, C) Magnified fragments marked by rectangles in (A), showing the authigenic grains of microcrystalline quartz within the cavity of microfossil. (D) Plane-polarized light image, demonstrating the cavity-infilling “flame chalcedony” consisting of radial-fibrous quartz. (E) Raman spectra of CM and embedding matrix, indicating that mostly weak signals of CM are affected by the embedding quartz.