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SUPPLEMENTARY ONLINE MATERIAL FOR

Applications and limitations of micro-XCT imaging in the studies of Permian radiolarians: A new genus with bi-polar main spines

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**Supplementary Online Material**

**SOM 1.** Characters considered in cluster analysis.

**SOM 2.** Character matrix used for the cluster analysis.

**SOM 1.** Characters considered in cluster analysis.

1. Shape of main spines: (0) cylindrical, (1) three-bladed.
2. Proximal part of main spines: (0) not embedded, (1) embedded.
3. Rod-like proximal part of the main spines: (0) absent, (1) present.
4. Distortion of main spines: (0) not twisted, (1) twisted.
5. Difference between main spines: (0) different in shape and size (1) similar in shape and size
6. Concentric shells: (0) absent, (1) present.
7. Radial beams: (0) absent, (1) present.
8. Medullary shell: (0) absent, (1) present.
9. Hollow space: (0) absent, (1) present.

**SOM 2.** Character matrix used for the cluster analysis.

<i>Protopsiium</i>	1	1	0	0	1	1	1	1	0
<i>Pegoxystris</i>	0	1	0	0	0	1	1	1	0
<i>Falcispongus</i>	0	1	0	0	0	1	0	1	0
<i>Spongoxystris</i>	1	1	1	0	1	1	0	1	0
<i>Dalongicaepa</i>	0	1	1	0	0	1	0	0	1
<i>Spongotortilispinus</i>	1	1	1	1	1	1	0	0	1
<i>Spongopallium</i>	1	1	0	1	1	0	1	1	0
<i>Archaeospongoprunum</i>	1	0	0	1	1	0	0	0	0
<i>Palaeospongurus</i>	1	0	0	0	1	0	0	0	0