SUPPLEMENTARY INFORMATION: Cambrian foreland phosphogenesis in the Khuvsgul Basin of Mongolia

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This supplementary information includes a simplified geological map highlighting the structural features of the Khoridol-Saridag and portions of the northern mapping regions (fig. S1) of the Khuvsgul Group study area, a geological map of the northern mapping region (fig. S2), and a geological map of the Darkhat Valley mapping region (fig. S3). Photomicrographs of thin sections from intrusive igneous geochronological samples are shown in figure S4. Figure captions for each supplemental figure are collated below.

Also included are several tables detailing the locations of all measured sections referenced in the text (Table S1), all carbonate chemostratigraphic data (Table S2), all geochronological data (Table S3), and all parameters used to build the tectonic subsidence model for the Khuvsgul Group (Table S4).

Code used to generate figures for the main manuscript text can be accessed at:

https://github.com/eliel-anttila/Anttila_et_al_Khuvsgul_2024.git

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SUPPLEMENTARY FIGURE CAPTIONS

Figure S1. Simplified geological map of the Khoridol Saridag and a portion of the northern mapping areas, highlighting structural data. Structures and data associated with dominantly E-W trending compression (D1) are colored dark blue, while structures and data associated with later NNE-SSW-trending compression (D2) are colored red. Purple structures and data indicate D1 structures that were subsequently deformed during D2. The position of the Arcai Thrust, which superimposes the para-allochthonous Khuvsgul Group strata that make up the Khoridol Saridag Range atop autocthonous Darkhat Group and Khuvsgul Group sequences, is indicated by the black arrows towards the top of the map.

Figure S2. Original geological map of the northern mapping region.

Figure S3. Original geological map of the Darkhat Valley mapping region.

Figure S4. Thin-section photomicrographs of intrusive igneous geochronological samples. qtz=quartz, pl=plagioclase, bt=biotite, hbl=hornblende, zrn=zircon, btc=chloritized biotite, mcl=microcline. Detail of a foliated portion of sample EAGC1942 in plane-polarized (panel A) and cross-polarized (panel B) transmitted light. Note partially-chloritized biotite at top-right of both panels, as well as a zircon inclusion within the biotite at the center of both panels. Detail of a dark band in heavily-foliated portion of sample EAGC1943, in plane polarized (panel C) and cross-polarized (panel D) transmitted light. Chloritized biotite is visible throughout both panels, with infrequent, unaltered biotite and partially-altered hornblende. Gneissic textures in thin section reflect heavy foliation observable in both hand-sample and in outcrop. Portion of sample EAGC 1944 in plane polarized (E) and cross-polarized (F) transmitted light. Note chloritized biotite at bottom left of both panels, as well as microcline with well-developed tartan twinning, at center-right of both panels. Detail of a portion of sample EAGC1925, in plane polarized (G) and cross-polarized (H) transmitted light. Note zircon within biotite (center-left, both panels). Detail of a portion of sample EAGC1926B, in both plane polarized (I) and cross-polarized (H) transmitted light.

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