LETTER

Geochemical data reported by Paquay et al. do not refute Younger Dryas impact event

In the 12,900-year-old Younger Dryas boundary layer (YDB), Firestone et al. (1) reported inferred extraterrestrial (ET) iridium peaks in sediments and magnetic separates that coincide with elevated abundances in potential impact markers, including microspherules and nanodiamonds (2). Paquay et al. (3) tested YDB sediments but could not reproduce previous iridium concentrations. However, their results seem problematic because standardization uncertainties ranged up to ±140%, and reproducibility varied up to ≈400% (tables S2 and S1, respectively, in ref. 3). Despite these uncertainties, they documented iridium peaks at Murray Springs, AZ (profile B1) and Lake Hind, AB, Canada (batches 1 + 2) at the same stratigraphic levels as spikes in nanodiamonds, magnetic grains, and microspherules (Fig. 1). Although their iridium values are ≈7% of our median values, theirs rise to ≈33% of lower limits and to >300% above background. Additionally, although they reported sedimentary osmium ratios ($^{187}Os/^{188}Os$) that seem terrestrial, they failed to analyze YDB magnetic separates, in which previous iridium concentrations were much higher and in which osmium ratios might possibly reveal an ET component, as Sharma et al. (4) reported from YDB-aged Pacific and Atlantic ferromanganese crusts. Paquay et al. (3) also speculated that wildfires created the YDB nanodiamonds, contradicting ≈100 years of research demonstrating that hexagonal and cubic diamonds form only under extreme temperature and/or pressure regimes (5), as occurred during the K/T impact and as proposed for the YDB. Overall, the results of Paquay et al. (3) are useful contributions to the YDB discussion, reinforcing the importance of additional research into the cooccurrence of iridium and osmium anomalies with inferred impact proxies.

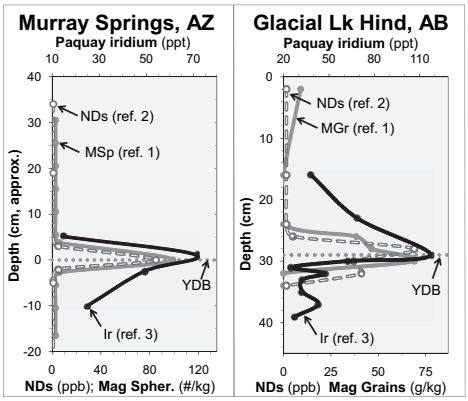

Fig. 1. Concentrations of iridium (black) from Paquay et al. (3) compared with nanodiamonds (NDs, dashed), microspherules (MSp, gray, *Left*), and magnetic grains (MGr, gray, *Right*).

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The authors declare no conflict of interest.

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