Comment on shpansky et al. 2016, ‘the quaternary mammals from kozhamzhar locality (pavlodar region, kazakhstan)


Published in: American Journal of Applied Sciences

Document Version: Publisher's PDF, also known as Version of record

Queen's University Belfast - Research Portal: Link to publication record in Queen's University Belfast Research Portal

Publisher rights
© 2016 Paula Jo Reimer and Svetlana Vladimirovna Svyatko. This open access article is distributed under a Creative Commons Attribution (CC-BY) 3.0 license (https://creativecommons.org/licenses/by/3.0/), which permits unrestricted use, distribution and reproduction in any medium, provided the author and source are cited.

General rights
Copyright for the publications made accessible via the Queen's University Belfast Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy
The Research Portal is Queen's institutional repository that provides access to Queen's research output. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact openaccess@qub.ac.uk.

Download date: 23. May. 2021
Comment on Shpansky et al. 2016, ‘The Quaternary Mammals from Kozhamzhar Locality (Pavlodar Region, Kazakhstan)

Paula Jo Reimer and Svetlana Vladimirovna Svyatko

Queen’s University Belfast, UK

Abstract: Here, we comment on the reliability of a recently published young radiocarbon date for the Siberian ‘unicorn’ (Elasmotherium sibiricum) from Kozhamzhar (Pavlodar Region, Kazakhstan).

The paper by Shpansky et al. (2016) bases the claim that the Siberian ‘unicorn’ (Elasmotherium sibiricum) survived in Eurasia as recently as 29,000 years before present on a single specimen. Our laboratory performed the AMS 14C analysis on protein (“collagen”) extracted from the bone using an ultrafiltration method which separates molecules by size (Brown et al., 1988; Bronk Ramsey et al., 2004). For the blank (background) correction we analysed the Latton mammoth bone (Lewis et al., 2006) from gravels thought to correlate with Marine Isotope Stage 7 (>190,000 years before present) provided by Dr. Fiona Brock, Oxford University.

Criteria for assessing the quality of collagen for radiocarbon dating has been discussed in the literature for decades and recently has been highlighted in Rodriguez-Rey et al. (2015). The dated Elasmotherium sibiricum bone appeared well preserved and had a whole-bone nitrogen content of 0.9% suggesting there would be sufficient collagen remaining (Brock et al., 2010). Percent carbon was 34.7, well within the recommended range of 34.8±8.8 (van Klinken, 1999). The collagen yield, however, was only 0.3% which is below the recommended threshold of 1% (van Klinken, 1999) and may have resulted in a larger proportion of contamination (such as younger humic acids) retained in the ultrafilter (Brock et al., 2013). There was insufficient collagen for stable isotope or elemental analysis so no further quality assurance measures were available. Although our laboratory would not normally proceed with analysis for low collagen yield samples, because there was no other sample available and the whole bone nitrogen content and percent carbon were suitable, we did provide the date (UBA-30522) but cautioned the authors that it should not be considered reliable.

Analysis of further specimens is necessary before this claim is validated.

Within our laboratory, bone samples meeting the initial criteria (whole-bone nitrogen content, % collagen yield, % carbon) are analyzed for stable isotopes and C:N ratios only if sufficient material is available after radiocarbon dating. There are some Holocene age samples, however, such as tooth roots, which are exceptionally well preserved and meet the initial criteria, but are too small to analyze for both radiocarbon and stable isotopes. These samples can still provide reasonably dependable dates but should be treated prudently. Our laboratory has taken additional steps to ensure that samples which do not meet the initial criteria are not analyzed for 14C and therefore not reported.

References
DOI: 10.2458/azu_js_rc.55.16304
DOI: 10.1016/j.jas.2009.11.015