



Reply

Reply to the comment by T. Vogt on “Geochemical and isotopic (Sr,U) variations of lake waters in the Ol’khon Region, Siberia, Russia: Origin and paleoenvironmental implications” by F. Chabaux et al. [C.R. Geoscience 343 (2011) 462–470][☆]

Réponse au commentaire par T. Vogt sur « Variations géochimiques et isotopiques des eaux des lacs de la région d’Ol’khon en Sibérie méridionale, Russie : origine et implications paléoenvironnementales » par F. Chabaux et al. [C.R. Geoscience 343 (2011) 462–470]

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ARTICLE INFO

Article history:

Received 5 September 2012

Accepted after revision 3 October 2012

Available online 9 November 2012

The beginning of Thea Vogt’s text (Vogt, 2012) is supposed to present a summary of the main conclusion of our article, namely “Chabaux et al., 2011 explained the varied salinity of the water in small lakes in the Pre-Olkhon region solely by the duration of evaporation ...”. This statement does not correspond at all to what we wrote, which probably results from a misunderstanding of the geochemical arguments presented in our article.

On the basis of geochemical data, including major and trace element concentrations, and Sr and U isotopic ratios of spring and lake waters from the Ol’khon Region, Siberia, Chabaux and co-authors showed that “the chemical

variability of these water samples, especially their salinity, cannot result from a single mixing process between surface freshwaters and deeper saline waters. The variability (observed at the scale of a few square kilometers) would preferentially result from secondary concentrations processes of lake waters of variable intensity from one lake to another” (Chabaux et al., 2011).

We did not actually discuss in details the precise origin of such a concentration mechanism on the basis of our data, because the data did not really allow it. We proposed that it could be related to the high rate of evaporation or to concentration processes linked to water freezing phenomena occurring in this geographic area, which we summarized under the term “cryogenesis” (Chabaux et al., 2011). In addition, we proposed from uranium data and modeling results, that beyond the intensity of the concentration processes, the time parameter, that is to say the duration of the concentration process, has also to be taken into account.

A contribution of “talik” waters as a possible source of lake waters, as suggested by Vogt, would certainly have to be considered, but this will require, however, to sample and analyze such waters in order to ascertain whether their geochemical characteristics may contribute at least partly to the geochemical signatures of the Ol’khon lake waters. But this is a study by itself, which was clearly beyond the scope of the published work.

DOIs of original articles: <http://dx.doi.org/10.1016/j.crte.2011.07.004>, <http://dx.doi.org/10.1016/j.crte.2012.10.001>

[☆] DOI of the original article: [10.1016/j.crte.2011.07.004](http://dx.doi.org/10.1016/j.crte.2011.07.004).

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Thea Vogt does not provide any novel argument nor data that might undermine the conclusions of the Chabaux et al. (2011) paper. All of our findings are therefore still valid, as well as the possible occurrence of a relationship between the salinity and the age of the lakes, emphasizing again, as written in Chabaux et al. (2011), that “at this stage such assumptions remain clearly working hypotheses, which need to be further discussed on the basis of further investigations focused on the hydrological and hydrogeological contexts of the region and/or on the study of salt lake sediments. This relationship between the age of the lakes and their salinity would indeed disappear, if the different lakes were fed by waters with different geochemical characteristics”. This is clearly different from the summary that is presented by Thea Vogt.

The data presented in the Chabaux et al. (2011) article, and the conclusions they have lead to, will be therefore to take into account by anyone who wants to explain the origin of these salt lakes.

References

- Chabaux, F., Granet, M., Larqué, P., Riotte, J., Skliarov, E.V., Skliarova, O., Alexeieva, L., Risacher, F., 2011. Geochemical and Isotopic (Sr,U) variations of lake waters in the Ol'khon Region, Siberia, Russia; Origin and paleoenvironmental implications. *C. R. Geoscience* 343, 462–470.
- Vogt T. A few comments on: Geochemical and isotopic (Sr,U) variations of lake waters in the Ol'khon Region, Siberia, Russia: Origin and paleoenvironmental implications. *C.R. Geoscience*, this issue; DOI: 10.1016/j.crte.2012.10.001.