Clim. Past Discuss., 5, S315–S317, 2009
www.clim-past-discuss.net/5/S315/2009/

Climate of the Past Discussions

Interactive comment on "Western equatorial African forest-savanna mosaics: a legacy of late Holocene climatic change?" *by* A. Ngomanda et al.

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Received and published: 7 August 2009

The major point stressed by the Anonymous Referee 1 concerns the chronology of the Maridor record. S/he considers that several of the inversed radiocarbon dates of the Maridor pollen record suggest heavily disturbed sediments and therefore this does not allow a strict use of any age model. The main goal of our paper was to determine whether the formation and expansion of Gabon8217;s coastal savannas took place around 4 ka BP (as recorded in Benin and Congo), or 2.5 ka BP and thus are a legacy of the recent disturbance of central African rainforests. To test these hypotheses, we needed a reliable chronology for the Maridor sediments. Unfortunately, the results of the radiocarbon analysis, indicating a number of inversed dates, seem to complicate the establishment of such a chronology. However, we are convinced that these inversed radiocarbon dates do not mean that the sedimentary sequence of

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Maridor is so reworked as to prevent the reconstruction of the ecosystem history of coastal Gabon.

We have interpreted these radiocarbon dates taking into account the stratigraphy and sedimentology of the sequence. This information has enabled us to determine the geomorphological context in which the Maridor sediments (or more broadly the lake basin) took place. Our findings clearly show that:

1. Many of the inversed radiocarbon dates are in the section 180-365 cm of the core MAR2. This part of the sequence is mainly composed of clayey sands, interspersed by numerous black organic laminae;

2. Radiocarbon dates in the section 180-365 cm of the core MAR2 show two contrasting patterns (see figure 3); the first one, which includes all radiocarbon dates obtained using bulk samples retrieved from non-laminae clayey sands, indicates calibrated dates covering the third millennium BP; the second one, however, obtained using bulk samples retrieved in the black organic layers, indicates older radiocarbon dates spanning the first half of the Late Holocene.

3. The older radiocarbon dates obtained from bulk samples of laminae clayey sands are close to the dates of the podzolic soil horizon in the base of the core MAR2. This suggests that these black laminae were allocthonous inputs, probably coming from the basal podzolic soil that surrounded the Maridor basin 4000 years ago. They indicate a strong erosive phase, which should be connected with significant vegetation changes (rainforest opening) as? recorded in the pollen spectra.

If sediments in the 180-365 cm section were strongly reworked, we would expect that the pollen spectra shows an incoherent signal, marked by a mixing of taxa typical of both pioneer and mature forest. In contrast, our findings clearly show that the pollen spectra are homogenously dominated by grass and plant species typical of pioneer forest throughout the 2 m-thick sand deposit. Hence, we can assume thus that the sediments were not heavily reworked and allow us to use an age model for the Maridor

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sediments.

Moreover, as shown by figure 5, the breakdown of the rainforest and its replacement by savannas in Gabon occurred before 2600 ś 40 BP, i.e., before the sediment was disturbed.

Specific comments in response to the anonymous referee, as well as technical comments by Lydie Dupont and the Editor have been taken into account in the revised version of our paper.

Interactive comment on Clim. Past Discuss., 5, 341, 2009.