April 10th, 2023

To the Chief Editor of *Palaeobotany and Palynology*

Dear Editor,

On behalf of my co-authors ,Doris Barboni and Jean-Charles Mazur, I would like you to consider our manuscript entitled **"Towards a more objective inference of local and regional vegetation types using pollen assemblages from the East Africa Rift (Ethiopia)"** for publication in your journal. This manuscript contains 8912 words (main text), three table, seven figures, six supplementary tables and two supplementary figure.

Pollen grains are a very good proxy of the vegetation and are particularly important for the study of Hominini sites in the Plio-Pleistocene of East Africa Rift. Hominini sites have long been known to be associated with riparian environments. These riparian environments allow the development of a wide variety of local vegetation that differs greatly from the surrounding regional vegetation. However, it is difficult to differentiate the local pollen signal from the regional pollen signal, which prevents the paleoenvironmental reconstructions of the local habitat of these Hominini. To help solve this difficulty, we propose a new approach to efficiently separate regional and local vegetation types based on pollen score calculations. We present the application of this approach on modern pollen data to discuss its effectiveness and the relevance of its future use on fossil data.

This study deals with 283 modern pollen spectra of surface samples (soils and muds) mainly from Ethiopia (251 spectra). We have 22% of pollen data that are new and were collected in 2009 by D. Barboni and R. Bonnefille and in 2017 by D. Barboni, J.-C. Mazur, and me. Our new modern pollens fill several gaps in the modern data that are important for the paleoenvironmental interpretation of fossil pollen data from Hominini sites in the Plio-Pleistocene of East Africa Rift.

Our work distinguishes from other related previous studies for a couple main reasons. (1) It is based on pollen scores without excluding aquatic plants in order to be objective and reproducible. (2) It is able to separating the local pollen signal (edaphically-driven) from the regional pollen signal (climatically driven) in the East Africa Rift. (3) It minimize the use of relative abundance data and maximize the use of relative abundance scales or presence/absence data, in order to minimize taphonomic biases in future comparisons between modern and fossil pollen data to better assess past vegetation.

As part of our main conclusions, we show that it is possible to discriminate 24 vegetation groups distributed in eight regional vegetation types and including nine riparian vegetation. We also show that reducing pollen information reduces noise in pollen spectra and that contrary to what one might think, working with a relative abundance scale or presence/absence pollen data is more efficient than relative abundance which is widely used in this type of study. Finaly, we highlight the importance of adapting the type of data used according to the depositional environment of pollen assemblages: relative abundance scale data for non-dynamic depositional environments and presence/absence for dynamic depositional environments.

In view of the aim, results and implications of this study, we therefore think that *Palaeobotany and Palynology* is the appropriate journal to publish our work and we would be honored by your consideration.

Yours sincerely,

Benjamin Bourel