

Interactive  
Comment

## ***Interactive comment on “The $p\text{CO}_2$ estimates of the late Eocene in South China based on stomatal density of *Nageia* Gaertner leaves” by X.-Y. Liu et al.***

**X.-Y. Liu et al.**

lssjjh@mail.sysu.edu.cn

Received and published: 3 October 2015

Thanks for your advices. We have taken full consideration of your suggestions and made the following answers:

1. As regard to the question on the number of fossil and modern specimens, we have made the following answers: (1) It is hard to add more fossil specimens, because there is no more *Nageia* fossil was found from the Maoming Basin. (2) We had tried our best and got more modern materials, so more data were added into the manuscript as suggested.
2. Is there any evidence of changing pore length in fossil *Nageia*, compared to modern

C1885

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



plants?

The average pore lengths in the adaxial and abaxial sides of fossil *Nageia* (17.6667  $\mu\text{m}$  and 17.33354  $\mu\text{m}$ , respectively) are a little smaller than those in modern leaves (19.46127  $\mu\text{m}$  and 19.83534  $\mu\text{m}$ , respectively). We also compared pore lengths from both the adaxial and abaxial sides to the atmospheric  $\text{CO}_2$  concentrations. The result is that there is no relationship between them ( $R^2=0.0009$  and  $0.0082$ , respectively).

3. ...This means that for higher  $\text{pCO}_2$  levels, it can become more difficult to evaluate the stomatal density response, and to reliably calculate  $\text{pCO}_2$  from stomatal data. Particularly for higher  $\text{CO}_2$ , a higher amount of data is necessary...

(1) We prefer to consider that the relationships between SDs (or SIs) and  $\text{CO}_2$  concentrations are linear which is used by many scientists (such as Kouwenberg et al., 2003, Bai et al., 2015 and Hu et al., 2015) (2) After added more modern data, the highest  $\text{CO}_2$  concentration is 348.98 ppmv, it is closer to the reconstructed results in our study.

4. Specific comments p. 2623, l.6: "However, the SDs and Sis data of the abaxial sides, summarized in Table 3, give significantly higher values (53.22-82.71 in SDs and 3.13-4.66 in SIs) than those from the adaxial sides." Did the authors check the differences in stomatal density between both leaf sides for statistical significance?

Yes, we checked the differences in stomatal density between both leaf sides and found that they are significantly different in average values and stated in the manuscript.

Please also note the supplement to this comment:

<http://www.clim-past-discuss.net/11/C1885/2015/cpd-11-C1885-2015-supplement.pdf>

Interactive comment on *Clim. Past Discuss.*, 11, 2615, 2015.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper