Response to reviewer #2

General comments 2 Overall a well written account of some new Cecideae-like fossils from China. There are several points in ms presentation etc. noted on the annotated PDF which need addressing. The main issues I have are the absence of several key references, as well as the lack of detailed comparisons with other bilobed Cercideae (at least two of which are not mentioned), especially for their cuticles. At the very least there needs to be more justification as to why the fossils must be *Bauhinia.* There also needs to be discussion of the Paleogene Sth Amer *Bauhinia* fossil described in 2013 and what effect this may have on the overall conclusions about timing of evolution and dispersal etc. in the group.

Response: Thank you for your positive comments. We have revised the manuscript accordingly. The mentioned references have been added or evaluated. For the comparisons with other bilobed Cercideae, that depends on how we adopt the classification scheme of *Bauhinia* L. In some recent treatments, *Bauhinia* L. is divided into eight genera including *Bauhinia* L. s.s., ***Barklya*** F. Muell., *Gigasiphon* Drake, ***Lysiphyllum*** (Benth.) de Wit, *Phanera* Lour., *Piliostigma* Hochst., *Schnella* Raddi, and *Tylosema* (Schweinf.) Torre et Hillc. Because the phylogenetic relationship within *Bauhina* + *Griffonia* + *Brenierea* clade has yet been fully resolved and the identification of *Bauhinia* leaf fossils possibly could not reach the *Bauhinia* L. s.s. level, we here adopt a traditional broad treatment of *Bauhinia*. See lines 51-62. Thus the mentioned *Barklya* and *Lysiphyllum* are actually included in the *Bauhinia* L. and we have not further compared our fossils with the two genera. As far as we know, there are no other bilobed leaves except that *Bauhinia* L. is morphologically identical with our fossils. We thank reviewer #2 to figure out *Dilobia* (Proteaceae) which also produces bilobed leaf. We have included this genus in the comparison. For the South American Paleogene *Bauhinia*, we have evaluated the *B.* aff. *B. divaricate* (see Brazilian Journal of Geology, 43(4): 639-652, Figure 4 A) preserved as a fragment without information of cuticle. We think the leaf fragment should have palmate venation, but this kind of leaves are found in many families such as Euphorbiaceae and Lauraceae. So we did not include the South American fossils in our manuscript.

Comment 7 Line 56 Biagolini, C. H., Bernardes-de-Oliveira, M. E. C., & Caramês, A. G. (2013). Itaquaquecetuba Formation, São Paulo basin, Brazil: new angiosperm components of Paleogene taphoflora. *Brazilian Journal of Geology, 43*(4), 639–652. "*Bauhinia* aff. *B. divaricata*"

Response: Yes, the South American "*Bauhinia* aff. *B. divaricata*" has been evaluated. It is a fragment of a leaf, lacking apex and cuticular information (see Figure 4 A in Brazilian Journal of Geology, 43(4), 639–652). The fossil seems to have palmate venation, but this kind of venation pattern could be found in many families such as Malvaceae, Euphorbiaceae and Lauraceae. So it may be not appropriate to be included in our study. Please also refer to our response to General comments 2.

Comment 8 Line 58 Carpenter, R. J., Goodwin, M. P., Hill, R. S., & Kanold, K. (2011). Silcrete plant fossils from Lightning Ridge, New South Wales: new evidence for climate change and monsoon elements in the Australian Cenozoic. Australian Journal of Botany, 59(5), 399–425. https://doi.org/10.1071/BT11037 Cenozoic (possibly latest Oligocene to mid–late Miocene) macrofossils from the Lightning Ridge include Bauhinia-like leaves from tribe Cercideae.

Response: Yes. The bilobed leaves in Carpenter et al. (2011) (Figs. 58-64) are well preserved and were assigned to cf. Cercideae/Detarieae (Fabaceae). In *Bauhinia*, two of the basal veins extend into the apex of the lobes (see BMC Evolutionary Biology (2015) 15:252 DOI 10.1186/s12862-015-0540-9). However, in those of the Carpenter et al. (2011), the veins diverged from the middle vein extend into the apex of the lobes. Therefore, we think the fossils in Carpenter et al. (2011) (Figs. 58-64) should not represent *Bauhina*. Please also refer to our response to General comments 2.

Comment 9 Line 180 Also *Bauhinia*-like Proteaceae. see Pole, M., & Bowman, D. M. J. S. (1996). Tertiary plant fossils from Australia's 'Top End'. *Australian Systematic Botany, 9*, 113–126.

Response: Important supplement. We have included *Dilobia* (Proteaceae) in the

comparisons. Please see lines 236-237.

Comment 10 Line 187 Also the Australian genera *Barklya* and *Lysiphyllum* See discussion in Carpenter et al. (2011)

Response: As in this study we adopt a broad circumscription of *Bauhinia*, *Barklya* and *Lysiphyllum* are actually members of *Bauhinia.* Please also refer to our response to General comments 2.

Comment 11 Line 191 There is a problem here as you assume morphology alone is enough to place into a genus, whereas many leaf taxa can be extremely similar and need cuticular comparisons to support placement. This should definitely be the case for at least the other Cercideae genera with bilobed leaves

Response: The species with bilobed leaves in the Cercideae were placed in the traditional *Bauhinia* L. which was divided into eight small genera in some recent treatments. We agree with the reviewer that leaf morphology may be not enough to distinguish the eight genera. Therefore, we adopt a traditional broad circumscription of *Bauhinia*. This could be more appropriate. Please also refer to our response to General comments 2.

Comment 12 Line 194 Expand to include missing Aust bilobed genera

Response: This has been done by Lin et al. BMC Evolutionary Biology (2015) 15:252 DOI 10.1186/s12862-015-0540-9. We have cited this paper in the manuscript. Please also refer to our response to General comments 2.

Comment 13 Line 262 Taxon names in italics

Response: Yes, the whole manuscript has been checked.

Comment 14 Line 305 Rework in terms of the fossils in Biagolini et al. (2013)

Response: The reference Biagolini et al. (2013) has been evaluated. Please refer to our response to Comment 7.