Thank you for your revised version of the manuscript. I have gone through all points in detail. Most points have been satisfactorily addressed by you, but there were quite a few issues that still need to be addressed before the paper can be accepted for publicaiton. See my specific comments below. The following line numbers refer to the manuscript version 2 without tracked changes:

L120-121: Change "Our previous researches have…" to "Our previous research has…".

Answer：I have changed this (L 121).

L149: Please add your criteria for defining "little human interference" which you listed in your answer to reviewer #2's first comment here.

Answer：Thank you. I added to this (L 150-156).

L150-152: Replace the sentence with your answer to reviewer#2's question, i.e.: "According to the methods and protocols for plant community inventories proposed by Fang et al. (2009), most of the vegetation surveys in this study were conducted by setting one 10 m x 10 m quadrat at the respective site. However, in a few areas with sparse vegetation and large heterogeneity, we set three 10 m $\times$ 10 m quadrats to ensure the accuracy of the survey data."

Answer: I made corrections in the manuscript (L157-161).

L156: Add "of the 10 m x 10 m quadrat" after "diagonal line".

Answer：Thank you. I added to this (L167).

L285-292: Your answer to reviewer #2's comment is comprehensible, but you added nothing to this paragraph in the revised version. This best and scientifically most solid way forward would be to disintegrate "present climate" and "palaeoclimate" into their respective components, then to repeat the SEM runs, and finally show the results of all relationships. Otherwise, the individual contributions of the temperature and precipitation components of present and palaeoclimate remain obscure.

Answer：Thank you very much for your suggestion, we have considered your suggestion and analyzed it. Firstly, according to the results of Random Forest in Fig. 2 in the manuscript, we selected climate variables with significant impacts on biodiversity, including present climate (AI, MAT and MAP), mid-Holocene climate (MAT_{mid}), last glacial maximum climate (MAT_{lgm}) and climate anomalies ($AMAT_{mid}$, $AMAT_{lgm}$ and $AMAP_{lgm}$). As shown in Fig. 4 in the manuscript, the effects of MAT_{mid} and MAT_{lgm} on biodiversity and biomass were not significant. According to Fig. S3 in the supplementary materials, among the three variables of the present climate, MAP and AI have a strong correlation, so we choose AI and MAT to indicate the current climate. Therefore, SEM was used to analyze the effects of current climate (AI and MAT) and paleoclimate changes ($AMAT_{mid}$, $AMAT_{lgm}$ and $AMAP_{lgm}$) on biodiversity and biomass. We first considered a complete model that included all possible pathways (Fig. S4), and then sequentially excluded non-significant pathways until the final model (Fig. 5 in the manuscript) was obtained. We used standardized path coefficients to measure the direct, indirect, and total effect sizes of current climate and paleoclimate changes on AGB. We added this to Data analysis (L249-255), Results (L306, L322-324 and L331-332) and Supplement Figure (Fig. S4) of the manuscript.
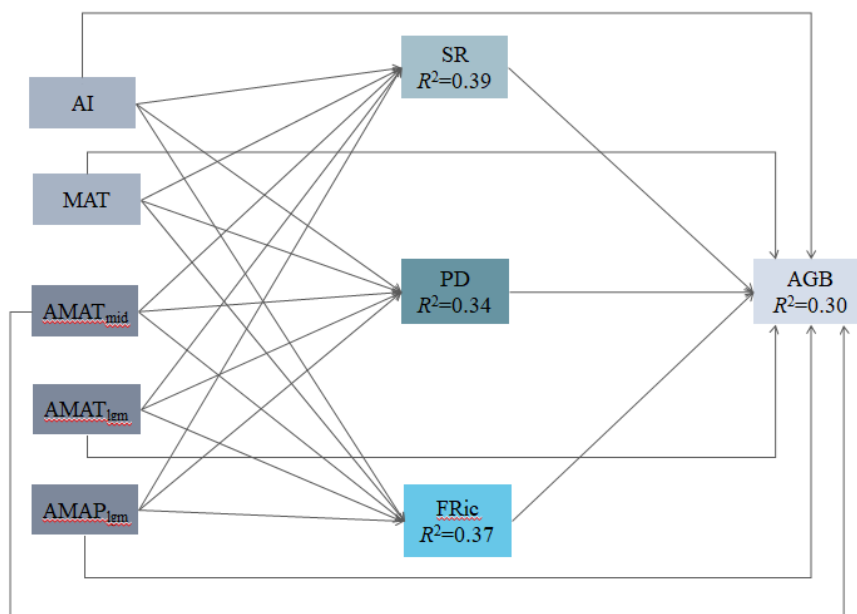

Fig. S4 A conceptual model assumed that the effects of present climate (AI and MAT) and paleoclimate change ($AMAT_{mid}$, $AMAT_{lgm}$ and $AMAP_{lgm}$) on diversity and AGB.

In addition, based on the your suggestions as well as the results of the Random Forest model, we run SEM for present climate (AI, MAT and MAP) and paleoclimate change ($AMAT_{mid}$, $AMAP_{mid}$, $AMAT_{lgm}$ and $AMAP_{lgm}$) respectively (Fig.1 and Fig.2 in Author's response). In Fig. 2, MAP_{mid} was excluded because it had no significant effect on either biodiversity or AGB. However, this result is not shown in the manuscript because it does not reflect the combined effects of climate and paleoclimate changes on biodiversity and AGB. The SEM was not performed separately on the climate of the middle Holocene and the last maximum ice age due to the following two factors: 1) MAP_{mid} and MAP_{lgm} ranked relatively low in the Random Forest model, and 2) MAT_{mid} and MAT_{lgm} had no significant influence in Fig. 4 of the manuscript.
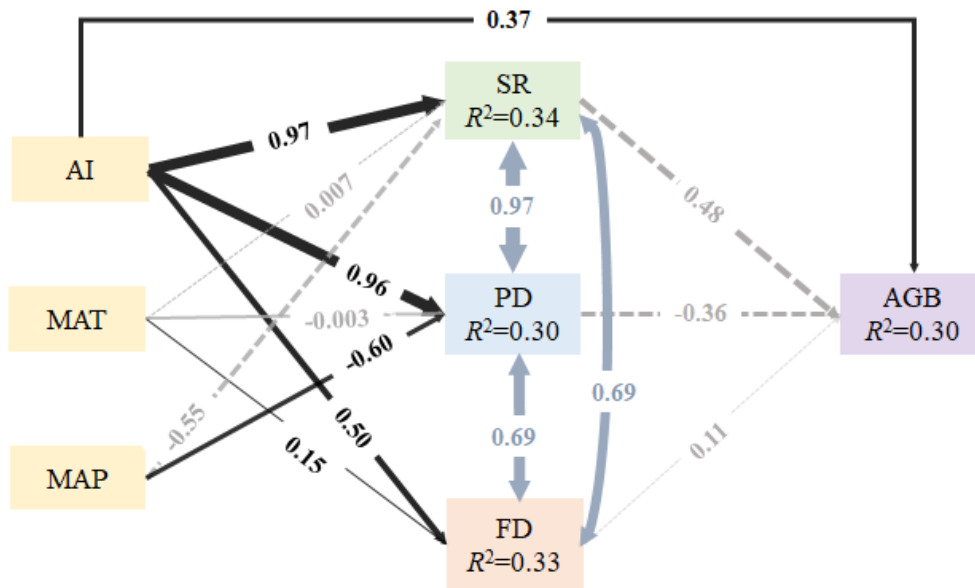

Fig. 1 The effects of present climate (AI, MAT and MAP) on diversity and AGB. Numbers adjacent to arrows represent the standardized path coefficients. R^2 indicates the proportion of variance explained. Black solid arrows indicate significant paths ($P < 0.05$), and gray dashed arrows indicate non-significant paths ($P > 0.05$).

Fig. 2 The effects of climate anomalies ($AMAT_{mid}$, $AMAT_{lgm}$ and $AMAP_{lgm}$) on diversity and AGB. Numbers adjacent to arrows represent the standardized path coefficients. R^2 indicates the proportion of variance explained. Black solid arrows indicate significant paths ($P < 0.05$), and gray dashed arrows indicate non-significant paths ($P > 0.05$).
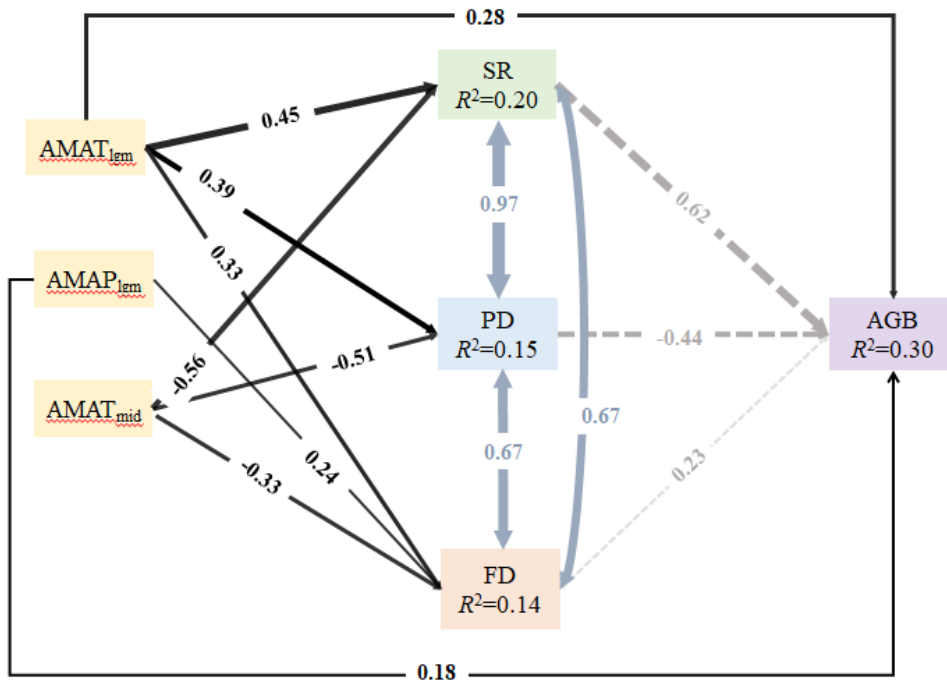
L345: Relationship with what? Please add the missing information.

Answer：I added the missing information (L361-362).

L378: Replace "Liu et al. showed…" with "It was shown that" (because you cite two papers, not only Liu et al. (2018b)).

Answers: I have revised it (L396).

L382-384: Change "are more susceptible to cold Quaternary climate oscillations" to "were more susceptible to cold Quaternary climatic conditions". Then start next sentence: "In contrast, herbs can mitigate…", and end it with "or by wilting of aboveground parts".

Answers: Thank you very much. I have revised it (L400-403).

L403: Add "caused by a combination of climate change and human activities in the Mongolian…".

Answers: I added to this (L422).

L426: There is a word missing after "evolutionary". Or did you mean "evolution"?

Answers: I didn't describe it clearly. This is evolution. I have revised this (L445).

L431: No need to introduce the abbreviation "(Ma)" here. You don't use it elsewhere.

Answers: I deleted the abbreviation "(Ma)" here (L450).

L436: Specify whether the numbers (time) relate to before present (BP).

Answers: I have added to this (L455).