**Answers to the questions:**

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**Reviewer #3:**

**1. Comment:** Chen et al. used a long transect dataset to reveal the relationships between leaf delta15N and leaf metallic nutrients. This study is good and dataset is valuable.

**Answer:** Thanks for your comments.

**2. Comment:** It should give a more general introduction about the leaf 15N. What is the meaning of leaf 15N value can be given?

**Answer:** Thanks for your comments. We have added the statement about leaf $\delta^{15}N$ （mark in blue color） in the introduction section as follows,

Nitrogen (N) cycling has received considerable attention, because N is the key element in regulating productivity of terrestrial ecosystems (Fay et al., 2015; Wieder et al., 2015) and many nitrogenous compounds generating from N cycling are associated with major environment issues (Bourgeois et al., 2018; Desmit et al., 2018). Natural N isotopic technique has been widely taken as a powerful tool in exploring the N biogeochemical cycling (Evans, 2001; Robinson, 2001), and nitrogen isotopic composition ($\delta^{15}N$) in leaf has been usually regarded as an integrator of N cycling (Evans, 2001; Robinson, 2001; Houlton et al., 2006, 2007; McLauchlan et al., 2007, 2013). This might be associated with the fact that leaf $\delta^{15}N$ could indicate soil N availability (Craine et al., 2009; Högberg et al., 2011) and plant N utilization strategies (Kolb and Evans, 2002; Houlton et al., 2007). Thus, revealing the potential factors that influence leaf $\delta^{15}N$ and investigating the relationships between these factors and leaf $\delta^{15}N$ could help improve our current understanding of N cycling (Craine et al., 2009; Hobbie and Högberg, 2012).

**3. Comment:** Why did not include the climate factors into the analysis? As we know the climatic factors are the most important factors in controlling leaf isotope values.

**Answer:** Yes, as we had mentioned in the introduction section, climatic factors, such as temperature and precipitation, have been reported to exert important influences on the variations in leaf $\delta^{15}N$. However, we have emphatically explored the relationships between leaf $\delta^{15}N$ and temperature and precipitation in another manuscript (Chen et al., under review). So in this manuscript, we just focused on the relationships between leaf $\delta^{15}N$ and metallic nutrients and did not include the climate factors.

**4. Comment:** The AIC value is more useful to select which modeling is more powerful to build the relationships between isotope values and nutrients (Tables 1).

**Answer:** Thanks for your comments. We have calculated the *AIC* values of each model as in Table 1. The model 3 has the lowest *AIC* value of 1058.3, thus, the model 3 is the best for explaining the variations of leaf $\delta^{15}N$. Meanwhile, we find that the *AIC* value of model 3 is only slightly higher than that of model 1, which means adding leaf Fe, Mn and Zn could not significantly improve the goodness of fit of the model 3 compared with that of model 1. Thus, the results of *AIC* values are also consistent with the results of $R^2$ or adjust $R^2$, i.e. the $R^2$ or adjust $R^2$ of model 3 is only a little larger than that of model 1. Comparison of the two models shows that leaf K, Ca, Mg are the major factors the main driving factors· of leaf $\delta^{15}N$.

Table 1. Multiple linear regressions of leaf $\delta^{15}N$ against leaf metallic nutrients based on ordinary least-square (OLS) estimation.

| Model | $R^2$ | Adjust $R^2$ | *AIC* | *P* |
|---|---|---|---|---|
| 1 | 0.543 | 0.540 | 1091.5 | <0.001 |
| 2 | 0.150 | 0.145 | 1404.6 | <0.001 |
| 3 | 0.557 | 0.551 | 1058.3 | <0.001 |

*Note*: Model-1 is the multiple regression of leaf $\delta^{15}N$ against leaf K, Ca and Mg; Model-2 is the multiple regression of leaf $\delta^{15}N$ against leaf Fe, Mn and Zn. Model-3 is the multiple regression of leaf $\delta^{15}N$ against leaf K, Ca, Mg, Fe, Mn and Zn. AIC, Akaike Information Criterion.