Response to comments by Anonymous Referee #3

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We appreciate the constructive comments raised by the Anonymous Referee #3 on May 15, 2015.

Question 1: Unfortunately the manuscript has some weakness in distilling the relevant information out of a principally interesting data set and putting this in context to previous works.

We will add the references, such as Bush and McInerney (2013, 2015) and others in the Introduction to highlight the significance of this work and its relationship with previous work.

Question 2: Further it mixes apples with oranges while comparing ACLs of alkanes to those of fatty acids.

We believe it makes no differences whether using *n*-alkanoic acids or *n*-alkanes when discussing the significance differences between woody and non-woody plants. Although absolute value of ACL between acid and alkane for single plant is different, we only focus on the statistical result instead of the absolute value.

Reply to General Comment,

GC1: "……, the fatty acid data set from Blood Pond is a little bit out of context in this manuscript, specifically if considering the compiled data from the literature which, with one exception, only refer to *n*-alkanes. If the authors want to keep their Blood Pond data within the manuscript, they should split it into an *n*-alkane and *n*-alkanoic acid part for both the new and the literature data.

As our reply to Question 2 above, we believe it makes no differences when comparing different *n*-alkyl compounds, no matter acid or alkane. In addition, there are several studies focus on acid (such as Wilkie et al.2013 and Douglas et al.2012) in our database except Blood Pond. However, we will add n-alkane data for Blood Pond plants.

Reply to Minor Comments:

MC1: "p. 5479 / l. 8: not totally true; there are a number of studies evaluating *n*-alkane patterns of plants as the compilation of data in this manuscript shows "

Most of the published paper that collected chain length data of different types of plants, however, quite a few paper highlight the result that ACL between woody and non-woody plant may overlap in most sites.

MC2: "p. 5479 / l. 13: "However single types of plants. . .": there is something wrong with this sentence."

We will rewrite the sentence as "However, 57 % of the sites in Bush and McInerney (2013) do not contain woody and non-woody plants at single site."

MC3: "p. 5481 / l. 21: "Because not all. . .": There is grammatically something wrong with this sentence. I suggest rephrasing. "

We will rephrase as: "We took the original ACL values in the publication since the abundance data for alkanes or acids are absent in literatures."

MC4: "Table 3: I suggest using bold letters for significant t-test results "

We will put the *t*-test results in bold in Table 3.

MC5: "Figure 2: I suggest putting the plant types of the second panel (Blood Pond) in a logical order (and similar order than panel A)."

The purpose that we put plant types in such an order is trying to keep consistent with Hou et al. (2007).