The authors have responded to and made some changes in response to some of my queries from my previous review. I understand that the authors' dataset did not include other traits I thought would improve the analyses, and it seems as though the final part of the conclusion was included to allude to that fact (although mentioning those limitations in the conclusion does not seem to be an appropriate place to do so). My concern about the differing habitats potentially affecting the results was addressed by some further analyses, presented in the supplementary information.

In brief, I believe the manuscript presents an interesting dataset and after a thorough revision (mainly to improve readability) it should be suitable for publication. The main area requiring particular attention is the Discussion, which at the moment sometimes repeats results more than is necessary and contains some tenuous explanations, especially when trying to link soil N to the results of the analyses. For this latter point, I believe that keeping in mind the high lability of soil N (and hence the problematic nature of linking a single measurement of soil N to any other attribute) would lead to a more consistent reasoning.

A few comments relating to several parts (or all) of the manuscript:

- When referring to concentrations (or ratios), in general, the word should be used in the plural (because you are referring to the collective concentrations, or ratios, of many species), not singular. This occurs in many places.
- The precision to which numbers are presented needs to be appropriate (often there are inappropriately many significant figures). There are many examples, but see Table 1 for many such instances.
- In the Discussion, there are often unnecessary references to figures and tables, previously referred to in the results section.
- Make the spacing consistent in all bracketed text: I suggest one space either side of =, < etc.
- It better to present descriptive statistics with either standard errors or confidence intervals, rather than standard deviations. I assume "std" means standard deviation, which by itself has limited utility as you also need the number of observations to make inferences from it. I would suggest to use 95% confidence intervals throughout.

Comments and suggestions at specific lines, many of which relate to grammar:

p. 2, l. 2: "are the key traits" is far too broad a statement; I suggest "are two key..."
p. 2, l. 5: insert "a" after leaving
p. 2, l. 8: replace "expanding" with "encompassing"
p. 2, l. 13: change "climates" to "climate"
p. 2, l. 14: change "nutrient" to "nutrients"
p. 2, l. 2: replace "explained more intraspecific one,." with "explained most of the intraspecific variation."
p. 2, l. 17: A final conclusion sentence would go well here, i.e. what it all means, what is the significance of the result.
p. 2, l. 20-23: This sentence needs toning down. I'm yet to see any evidence to suggest that stoichiometry is the "most important single step" towards understanding. Westoby and Wright (2006) do not make such a claim.
p. 3, l. 1: delete "the" before energy
p. 3, l. 22: replace "rate" with "rates"

p. 4, l. 1-2: I think the colour highlight (in the manuscript) refers to a strange sentence construction - I agree. This part of the sentence needs revision or deleting.
p. 4, l. 3: replace “difference” with “differences”
p. 4, l. 10: "prior to others" - I'm not sure what you mean. This needs changing.
p. 4, l. 13: “simultaneous” is not needed here
p. 4, l. 22: “Shrubland is the climax vegetation adapted to the drought” needs modification. Stated this way implies that "drought" is permanent, in which case it would not be "drought" but simply a dry or arid climate. Perhaps you meant "arid climate", or some such?
p. 4, l. 24: replace “on” with “of”
p. 4, l. 13: insert “the patterns” before “in”
p. 5, l. 1-14: These need to be in the past tense, as they were introduced as such in the preceding sentence.
p. 5, l. 2-4: I had to reread this to understand what you meant. Insert “increasing” before precipitation.
p. 5, l. 9: As written, Hypotheses 3 contradicts itself: “leaf N concentration is less phylogenetically conserved... leaf N concentration tends to be more genetically constrained”. This needs rewording.
p. 5, l. 12-14: Better to restructure the sentence in the form of "We hypothesized that...should be less likely...and hence are more adapted to..."
p. 5, l. 22: better to use an x symbol instead of *
p. 5, l. 24-25: The grammar of the sentence needs addressing. I suggest something like: "the dominant life form... was "shrub"..."
p. 6, l. 3: replace “the depth” with “a depth”. Replace “meter” with “m”
p. 6, l. 5: delete “the” from “the depths”. The latter half of this sentence could be combined (via a ;) with the next sentence.
p. 6, l. 12: What was the ratio of soil:water?
p. 6, l. 12, 14: Insert “the” before “0-10”
p. 6, l. 20: delete “for”
p. 6, l. 21: replace “property” with “properties”.
p. 6, l. 22: replace “N concentrations and” with “N and P concentrations, and leaf”
p. 6, l. 24-25: The latter part of the sentence is not really necessary.
p. 7, l. 12: replace “attribute” with “attributed”.
p. 7, l. 24: replace , with ;
p. 7, l. 25: delete “the”
p. 8, l. 3: replace “compare” with “compared”. No hyphen necessary in the first “main-effects”
p. 8, l. 6: replace “scale” with “scales”.
p. 8, l. 20, 24: replace “conducted” with “calculated the”.
p. 8, l. 24: delete “the”.
p. 8, l. 27: “shuffling the tips for 999 times” – more explanation needed here.
p. 9, l. 1: insert “the” before “K”
p. 9, l. 5: replace “signal” with “signals”.
p. 9, l. 6: replace “of mean” with “for mean”.
p. 9, l. 10: The heading needs changing: overall patterns are described first. Then you have a section on climate. I suggest adding in subheadings for each appropriate result, e.g. one (only) for the effect of climate
p. 9, l. 11: It's slightly ambiguous the way this is phrased: it would be better to start with leaf N and then leaf P, i.e. "Leaf N....and leaf P...". "Northern China" is not needed here. Also, here you mean "ranged" rather than "changed" – this occurs later on too. As a whole, I think this paragraph would be easier to interpret if the changes (increases or decreases) were stated after the concentration ranges, e.g., Leaf N concentration ranged from...increased with soil pH, decreases with STN...
That is, each element/ratio would be contained in the one section.

p. 9, l. 23: Part of this paragraph restates some of the results given in the preceding paragraph. In line with an earlier comment about headings, it may be better to segregate these results into soil-based results and climate-based results (giving two subsections)
p. 10, l. 9: rephrase "temperate shrubland and desert shrubland" to "temperate and desert shrublands"
p. 10, l. 10: delete “the”
p. 10, l. 11: insert a comma before “separately”. Replace “The temperate shrubland” with “Temperate shrublands”.
p. 10, l. 12: replace “with” with “to”. Replace “shrubland” with “shrublands”.
p. 10, l. 14: replace “shift” with “shifts”.
p. 10, l. 18: insert “a” before “significant”
p. 10, l. 24: delete “the”
p. 11, l. 1: This paragraph needs to be consistently in the past tense when referring to your results.
p. 11, l. 1: delete “also”
p. 11, l. 6-10: the sentence needs revision: I suggest "runs from life strategies characterized..., to life strategies characterized by..."
p. 11, l. 6-10: replace “distinct” with “differences in”
p. 11, l. 19: “dessert” with “desert”. This occurs elsewhere.
p. 11, l. 22: replace “rate” with “rates”
p. 11, l. 25: insert “resulting in succulent plants having leaf” after “therefore”
p. 12, l. 1: Dust transport can also provide a very significant component of soil P, particularly if the soils are poor in P. Replace “increase” with “increases”
p. 12, l. 2: delete “the” before P. Replace “litters” with “litter”. It would be better to have a reference for this statement. Replace “region” with “regions”.
p. 12, l. 3: Final section of the sentence is not necessary and doesn't follow from the decomposition point.
p. 12, l. 3-5: I would suggest removing the superfluous parts of this sentence and simply stating (after a ;) that 301 of the study sites had an aridity index of < 1.
p. 12, l. 4: You didn't use "AI" again, so remove the acronym.
p. 12, l. 7: Replace “shrubland” with “shrublands”.
p. 12, l. 8: insert “a” before hypothesis
p. 12, l. 11: Replace “rate” with “rates”. Replace “inconsistent” with “in contrast to”.
p. 12, l. 13: Replace “Most” with “Many”
p. 12, l. 16: You would need analyses to back up that statement (about effects of temp and precipitation being confounded).
p. 12, l. 17: Replace “allow” with “allowed”
p. 12, l. 18: The grammatical structure of the last sentence and a half needs revision.
p. 12, l. 21: The whole reasoning and argument outlined in this paragraph is long-winded and not convincing. It needs a revision and shortening. The study presents some evidence for P limitation (although an N:P ratio of 18.7 is not especially high), but a literature search will reveal many studies showing leaf P correlated to increasing soil P. As for leaf N, I would suggest that, in contrast to soil P, soil N is highly labile, so sampling soil N at one point in time might not be sufficient to link it to leaf N (i.e. an integration of repeated measures over an extended period of time would be necessary to detect such patterns).
p. 14, l. 1: Replace “on” with “at the”
p. 14, l. 4: insert “explained by” after “than that”. The final part of the sentence is a somewhat redundant.
p. 14, l. 8: insert “these” after “but”.
p. 14, l. 9: delete “the”

p. 14, l. 11: As you don't present results detailing the shift in community composition you can only speculate (rather than stating) that the climate influences leaf nutrient concentrations in the community by shifts in composition.
p. 14, l. 13: The statement about leaf N concentrations needs changing - there are undoubtedly many other factors at play, as the low R^2 numbers from your study would indicate.
p. 14, l. 14-16: These final two sentences don't make a lot of sense when taken with the previous sentence.
p. 14, l. 22: Do you have better references for changes in species composition in the sites covered by this study? The He et al. (2008) reference does not cover the same area.
p. 14, l. 24: Replace “gradient” with “gradients”. Replace “mainly” with “presumably [or likely]”
p. 15, l. 3-6: The sentence structure need reviewing and changing.
p. 15, l. 14: Replace “nutrient” with “nutrients”.
p. 15, l. 15: Replace “uptaking” with “uptake”.
p. 15, l. 16: There's no good evidence for that statement, as phrased. It is true that most plants are AM, but plants can also take up P by themselves, even with AM present; proportions of the contributions to nutrition can, and do, vary.
p. 15, l. 17: Replace “of” with “by”.
p. 15, l. 18: The final statement needs revision - Jacobson (1997) doesn't support that - and I know of no comprehensive review that does either.
p. 15, l. 23-24: “concentrations were mainly influenced by different factors” is vague.
p. 15, l. 21-27: Use the past tense for the results summarised in this paragraph.
p. 16, l. 1: Replace “utilize” with “to acquire”.
p. 16, l. 2: Insert “are likely” before “due”
p. 16, l. 4-9: These highlighted final sentences are somewhat out of place in the conclusion: such limiting factors would be better placed in another part of the discussion.
p. 24, Table 1: See comments about significant figures and confidence intervals. Also check all superscripts (e.g. mg g-1)
p. 25, Table 2: It would be far better to label each section with N, P and N:P, rather than a), b) and c). This applies to other tables as well (in the supplement).
p. 27, Figure 2: This legend seems to obscure some data. Replace “logarithm transferred” with “log-transformed”. These comments also apply to Figure 3.
p. 29, Figure 4: Please explain in the text or caption how the total variation explained can be less than one component of the total variation (part a). As it stands, this does not make sense. In line 3 replace “parts of the columns” with “shading”.

Supplement
p. 1 l. 22: By significant do you mean $p < 0.05$ or $p < 0.001$? This will need updating in the main manuscript as well.
p. 6 l. 2: “soil intervals” – do you mean depth intervals? (units are required).
Table S2 and S3 – see comments about Table 2.
p. 6 l. 2: Replace “shrbland” with “shrubland”