Relationship between leaf C, N and soil C, N: A case study of degraded grassland in western Jilin Province

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Carbon (C) and nitrogen (N) are crucial chemical elements to plant and soil, they play important roles in plants growth and various physiological regulation mechanism. At present it is generally believed that the loss of soil nutrients(C, N etc) is accompanied with land degradation process, and plant nutrients are the dominant source to soil C and N. Therefore, the relationship between plant leaf C, N, C/N and soil C, N, C/N has been one of the hotly-discussed issues in the ecological stoichiometry. However, the C, N stoichiometry in the leaves of Leymus chinensis and soil conditions from the grassland in Chang'ling county in western Jilin Province, NE China, provides insights for the above issue. Our objective is to determine how and to what extent soil organic C(SOC), total N (STN) and C/N(S-C/N) influence leaf total C(LTC), total N (LTN) and C/N(L-C/N) in the study region.

This paper reports the SOC and STN contents of 18 surface soil samples(0-20cm) and the LTC and LTN contents of 18 Leymus chinensis samples.The results indicate that the average content of LTC (457.07mg·g^{-1}) is lower than the global average content (464mg·g^{-1}), however, the LTN content(22.37mg·g^{-1}) is higher than the global average content (20.6mg·g^{-1}), however, the C/N ratio in Leymus chinensis leaf (21.59) is higher than the global average value (16.0). Moreover, the contents of SOC and STN are 10.35mg·g^{-1} and 1.11mg·kg^{-1}, respectively. The research results of Bohn *et al* indicated that the average S-C/N ratio was about 12 in the grassland of almost no land degradation, however, the S-C/N ratio of the study region is 9.44, it is lower than 12. In addition, Pearson correlations analyses done by SPSS software indicate that LTC does not exhibit evidently correlations with SOC (r=-0.19, n=18) and STN (r=-0.16, n=18). The LTN also has no significant correlation with SOC (r=0.11, n=18) and STN (r=0.132, n=18). While the LTN has a very significant negtive correlation with L-C/N ratio(r=-0.918, n=18). The SOC has a very significant positive correlation with STN(r=0.981, n=18). Taken together, the ratio of S-C/N is considerably lower than the global average, while L-C/N ratio is higher than the global average. The variation laws of soil C, N and C/N are inconsistent with plant leaf C, N and C/N. It is suggested that plant leaf C, N and C/N can influence soil C, N and C/N, but be not necessarily leading factor.

Therefore, we conclude that high plant C, N and C/N ratio does not necessarily lead to the high regional soil C, N and C/N ratio correspondingly, they are likely caused by other factors such as soil microbial activity, the decomposition degree of plant residues, soil texture, and external environment and so on.

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Distribution and sources of organic matter (OM) in a tropical intertidal mud bank of French Guiana

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The 1600km-long coast of South America between the mouths of the Amazon and the Orinoco is characterized by the occurrence of Amazon-derived mud banks. These mud banks are highly unstable structures due to a combination of sedimentary processes (erosion, re-suspension, re-deposition). Depending on their elevation and tidal cycles, they can be temporally emerged, resulting to their rapid colonization and stabilization by microphytobenthos and opportunistic mangroves (i.e. *Avicennia germinans*).

Due to their rapid colonization by vegetation and their strong hydrodynamics features, mud banks represent preferential sites for accumulation and intense remineralization of organic matter (OM). The objectives of this study are **(1)** to characterize the distribution of sedimentary OM and **(2)** to identify the OM sources of sediments sampled during the 2008 Equinoctial spring tide on the landward face of the Macouria mud bank (French Guiana). Elemental and stable carbon and nitrogen isotopic compositions were measured for sediments and potential OM sources (*Avicennia germinans* leaves, microphytobenthos and suspended particulate matter (SPM)). Lower TOC and TN contents are observed, indicating either low terrestrial OM inputs and/or extensive remineralization induced by important and repeated remobilization of mud deposits. The relative contributions of mangrove plants, SPM and microphytobenthos have been estimated using the atomic TN/TOC ratio and the $\delta^{13}C$ values. OM preserved in the sediments is mostly controlled by the SPM associated with minor amounts of OM derived from mangrove plants and microphytobenthos.

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