COMMENTS AND LETTERS TO THE EDITOR

Comments on “The Influence of Eolian Dust on Alpine Soils”

The following problems impact the interpretations of the data presented by Litaor (1987):

1. The discriminant analysis performed on the surface and subsurface horizons does not indicate “that the deposition of eolian dust is the dominant soil forming process in the pedogenesis of the surface horizons in the Front Range, CO” as stated in the Results and Discussion section. The fact that the two groups of horizons can successfully be separated by the discriminant analysis supports the boundary identifications made by the author in the field. It does not indicate anything about the genesis of either group of horizons. For example, I would expect that discriminant functions based on the variables sand, silt, pH, cation exchange capacity, and Ca would be useful in separating E and Bt horizons for virtually all Alfisols. In any case, a split sample should have been used to validate the analysis since classification functions are always more accurate for the sample used to build them than they would be for the full population (Klecka, 1980).

2. I am not sure what to make of the data in Table 5. If the gram values of sand, silt, and clay represent total deposition, then the pipette method of the SCS (1982) could not have been used, without modification at least, since it requires a 10-g sample size. If these data are converted to percent, then the values for sand ($\bar{x} = 37\%$, range = 32–48%), silt ($\bar{x} = 17\%$, range = 12–24%), and clay ($\bar{x} = 46\%$, range = 40–54%) are more easily compared to the percentage values in the Tables 1 and 3 for surface and subsurface horizons. The author's data differs from that of Thorn and Darmody (1980), since 17% silt clearly does not justify the description “silt-rich” for the author's dust samples. If anything, they are “clay-rich.” Thus, the data collected by the author do not support his hypothesis of eolian origin for the surface horizons. The material collected by the author contained less silt than the average of the subsurface soil horizons.

Thorn and Darmody (1980) described the eolian deposits that they collected as being intermediate between loess and cover sands. They concluded that fine (silt and clay) materials were being selectively transported from interfluves to tundra meadows, nivation hollows, and lakes. Dry tundra was the apparent source of these materials.

3. The discriminant function used to evaluate grouping on Alpine Soils'”

The average texture of the surface soils result in placement in a loam textural family from the soil surface horizons nor would the author meet the definitions presented by Smalley and Vita-Finzi (1968) requirements of loess by Russell (1944). Comparisons of blown dust using mechanical analysis have been at least 1945 (Swineford and Frye, 1945), detailed evaluation of particle size distribution and subsurface horizons might be useful.

5. Since the spodosolic subgroup modifier the author is not a part of Soil Taxonomy Staff, 1975), it would be appropriate to recent taxonomy of the soils in Table 1. The author's suggestion for a modification is being evaluated. The implication is that the depo-

Both Zeuner (1949) and Reiger (1983) suggested that there is a critical characteristic origin for silty surface layers in alpine soils, and Litaor's data do not rule out that hypothesis for soils.

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References


