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What role does human activity play in microbial biogeography?: The revealing case of testate amoebae in the soils of Pyramiden, Svalbard.

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HIGHLIGHTS

- Uncertainty surrounds the role of human activity in microbial biogeography.
- We considered an unusual soil translocation ‘accidental experiment’.
- We find no evidence for testate amoeba species translocation.
- It appears that over thirty years the assemblage may have acclimated to Arctic conditions.

ABSTRACT

The role of human activity as a vector in the movement of soil microorganisms is uncertain and disputed. It is increasingly clear that some larger microorganisms have restricted distributions and plausible to imagine that many human activities could lead to exotic species introductions, but concrete examples are lacking. We investigated an unusual case study: the former mining settlement of Pyramiden on the island of Spitsbergen in the Svalbard archipelago. In around 1983 large quantities of chernozem soils were imported from the southern USSR as part of an urban greening initiative, bringing large numbers of soil organisms to a very different physical environment. Focusing on a readily-identifiable group of protists with documented regional endemism (testate amoebae), we assessed morphospecies assemblages after thirty years. We analysed communities from Pyramiden imported soils and conducted comparisons to: i) nearby locations with non-imported near-natural soils; ii) previously-established datasets from near-natural Svalbard soils and chernozem soils in southern Russia, and iii) regional species inventories from both regions. Our aims were to assess how the community has adapted to the change in physical conditions and identify any evidence for the import of exotic taxa. Our results show significant differences between the assemblages of imported soils and those of nearby reference sites but strict comparisons are complicated by the different treatment of soils in different locations. No taxa were identified which

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