Is genetic variation in springtail populations affected by high concentrations of metals in soil?

It is already known since the early 1900s, that toxicants significantly change genetic variation in natural populations. Three processes in which toxicants cause changes in genetic variation are known:

- Some toxicants are mutagenic. High concentrations of those chemicals in the environment may directly increase the rate of mutation.
- Toxicants may indirectly increase the mutation rate by affecting DNA repair systems.
- Toxicants may cause directional selection and a decreased population size. Normally directional selection and decreased population size will decrease genetic variation in natural populations.

Is it possible that these forces balance each other?
We try to determine whether directional selection in *Orchesella cincta* (Collembola) populations exerted by metals in soil affects not only genetic variation in tolerance traits, but also in the genome at large, which could lead to a loss of capacity to adapt to other environmental challenges.
During the project a new method of AFLP, denoted as TE-AFLP, will be used to determine genetic variability within *O. cincta* populations. Another promising approach is the use of microsatellites. Van der Wurff et al. have demonstrated the presence of several microsatellite loci in this species.

**Duration**

4 years (September 2000-September 2004)

**Participants**

Martijn Timmermans, Jacintha Ellers, Nico van Straalen