**SUPPLEMENTARY DATA**

**Treatment effects on predaceous and fungivorous mite biomass**

Biomass estimation for each morphotype in the predaceous and fungivorous mite groups, and collembola (milligram dry mass per m2) were calculated using the abundance of each type times the average measured biomass of indivduals. Where abundances were not sufficient to measure dry mass, biomass was estimated from similar sized types within the same group.

There was a significant effect of treatment on microarthropod biomass (milligrams per m2; Wilk’s λ = 0.11, *F*15, 33.53 = 2.758, *P* < 0.007). Large predatory mite biomass in the *continuous* treatment was significantly greater (4.5 times) than in the fragmented treatments (*F*3, 16 = 13.648, *P* < 0.001; contrast 1: *t* = 6.059, *P* < 0.001), while biomass of small fungivorous mites were significantly lower (5.7 times) in the *continuous* treatment versus the fragmented treatments (*F*3, 16 = 4.953, *P* = 0.013; contrast 1: *t* = -3.135, *P* = 0.006) (Fig. S1).

Our biomass results are consistent with our understanding of this detrital system, as a reduction of total biomass has been shown to lower net rates of nitrogen mineralization (Hunt & Wall 2002).

Reference:

Hunt, H.W.&Wall, D.H. (2002). Modelling the effects of loss of soil biodiversity on ecosystem function. *Glob. Change Biol*., 8, 33–50.**Supplemenary Figure S1.** The effect of fragmentation on the biomass (mean mg/m2 ± SE) of large predaceous mites (circles) and small fungivorous mites (squares) at the end of the experiment (315 days).

**Supplemenary Figure S2.** The effect of fragmentation on the biomass (mean mg/m2 ± SE) of the dominant collembola group Isotomidae (~75% of collembola biomass) at the end of the experiment (315 days).

**Supplemenary Figure S3.** Image of PVC-based chambers used to maintain the moss microcosms.

