

## Photodegradation of grass litter in semi-arid grasslands — a global perspective

In a recent Letter, Austin & Vivanco<sup>1</sup> reported evidence from an experiment in the Argentinian pampa showing that only sunlight had a significant effect on the decomposition of grass litter, as opposed to the usual agents (mesofauna or microbial decomposers). Here I put their study into the context of previous research to show that abiotic decomposition plays a great role in semi-arid grasslands in general.

I compared four studies that quantified the effect of sunlight on grass litter decomposition after half a year. Each study used local grass litter. In three studies relative mass loss after about half a year (5 to 7 months) is reported. The fourth study<sup>2</sup> reports regressions based on monthly sampling from which I calculated the values for mass loss after 6 months. In the absence of microbes and mesofauna but exposed to sunlight, mass loss was 6% in a North American shortgrass prairie<sup>2</sup>, 23% in a Russian steppe<sup>3</sup>, and 16% in the pampa<sup>1</sup>. Mass of sun-exposed litter with decomposers present was 15% higher than that of shaded litter in a North American mixed-grass prairie<sup>4</sup>. This is close to the difference of 11% between shaded and unshaded litter found in the pampa<sup>1</sup>. The relative contribution of abiotic decomposition in the three studies that removed decomposers was 100%<sup>1</sup>, 70%<sup>3</sup>, and 33%<sup>2</sup>. The relative contribution of light in the two studies that used shades was 68%<sup>1</sup> and 18%<sup>4</sup>. Austin & Vivanco's<sup>1</sup> finding that UV radiation contributes significantly to photodegradation supports earlier results by R.I. Zlotin published in Russian in 1979<sup>5</sup> that shortwave light breaks down litter faster than does longwave light. Thus, a broader view of the literature shows that litter degradation by shortwave light is an important or the most important factor of litter decomposition in semi-arid grasslands in general.

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Printed 2006-12-21.