

# V GRAFOB

## 2020

### Quinta Reunión del Grupo Argentino de Fotobiología



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**4 de Septiembre, 9:00 hs**

## Shining light on plant litter decomposition in terrestrial ecosystems

Human activities are altering biogeochemical cycles globally, and our understanding of the controls on carbon and nutrient turnover in terrestrial ecosystems is essential for our ability to mitigate and minimize human impact in natural ecosystems. Plant litter decomposition is an essential process in the first stages of carbon turnover in terrestrial ecosystems, and provides some of the principal inputs of carbon for the formation of soil organic matter. Our research focuses on the role of photodegradation, the photochemical transformation of organic matter due to exposure to solar radiation, as a mechanism for previously unexplained high rates of carbon loss to the atmosphere in semiarid ecosystems. In addition, we have demonstrated indirect effects of photodegradation on biotic stimulation of carbon turnover in a wide range of species. Field studies in Patagonian woodland ecosystems confirm the importance of biotic facilitation on litter decomposition, which appears to have larger stimulatory effects than those observed in controlled conditions. The generalized positive effect of solar radiation exposure on subsequent microbial activity appears to be mediated by increased accessibility to cell wall polysaccharides, which is consistent in both field and controlled condition experiments. These results suggest that exposure to solar radiation is quantitatively important in affecting the global carbon cycle, which has implications for the potential alterations in carbon turnover in terrestrial ecosystems to predicted climate or land use change.