

Effect of forest management and ungulate grazing on litter quality of Holm oak (*Quercus ilex* L.)

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AIM

To investigate the interactive effect that native ungulates grazing and forest management have on litter quality of *Quercus ilex*.

METHODS

We determined main leaf litter compounds (carbon, nitrogen, cellulose, etc.) of Holm oak trees from inside and outside ungulate exclusion plots with contrasting forest management (forest versus open woodland), in Cabañeros National Park (Ciudad Real province, Central Spain).

RESULTS

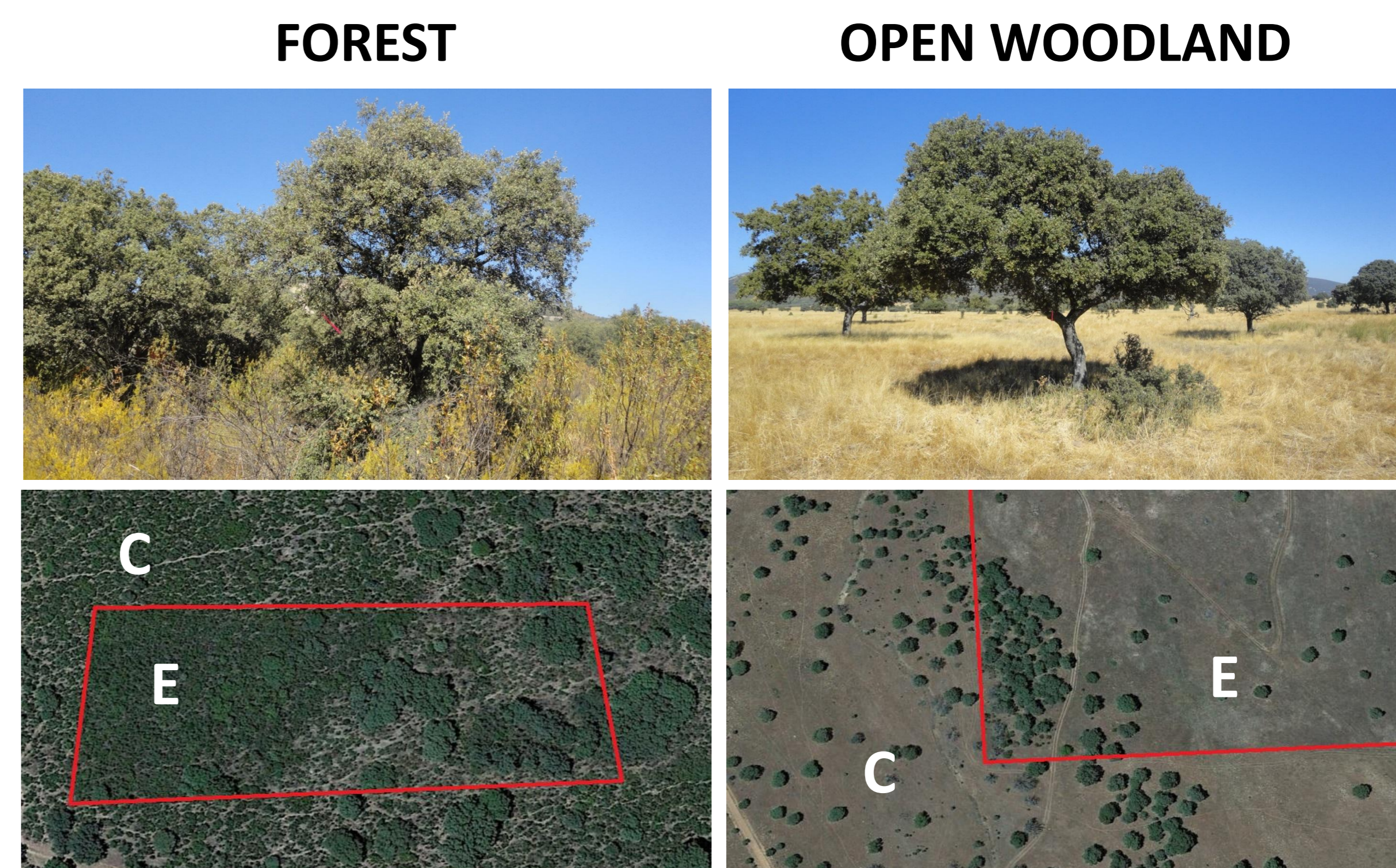
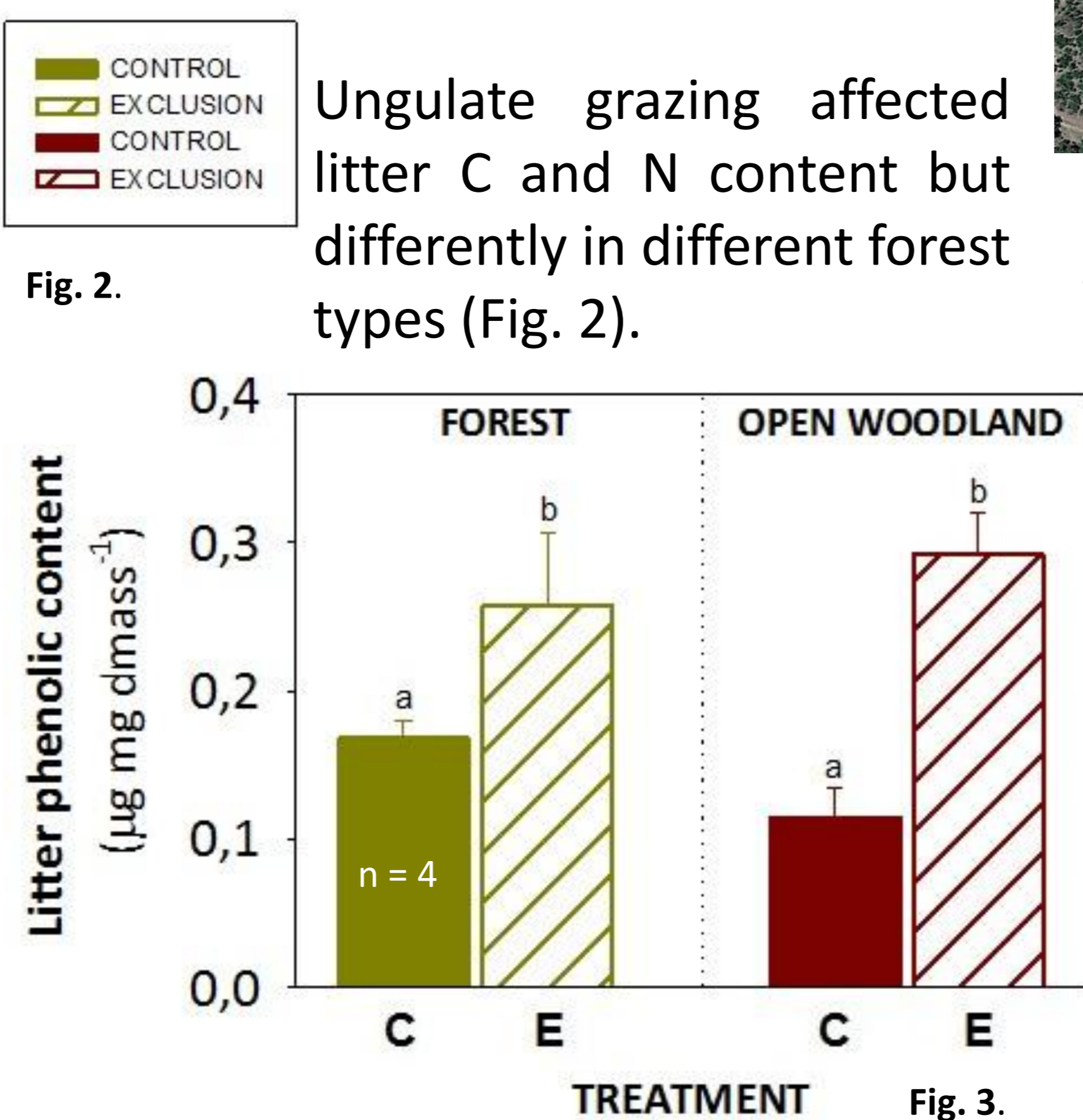
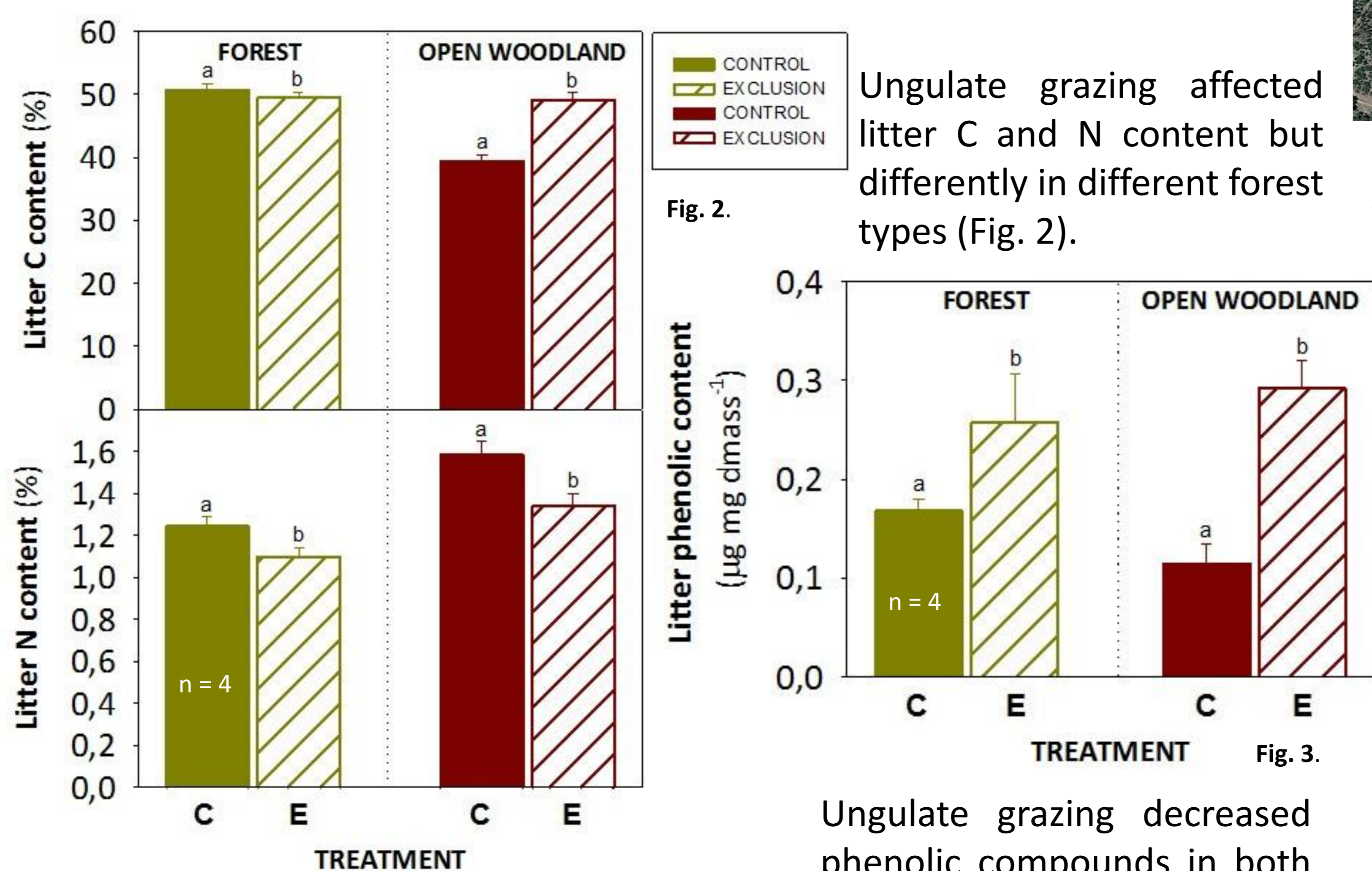


Fig. 1. Forest and open woodland (top) showing ungulate exclusions (E), and control (C) plots (N = 2).

Ungulate exclusion had the opposite effect on the cellulose content of litter in forest and open woodlands whereas consistently increased the content of hemicellulose in both forest types (Fig. 4).

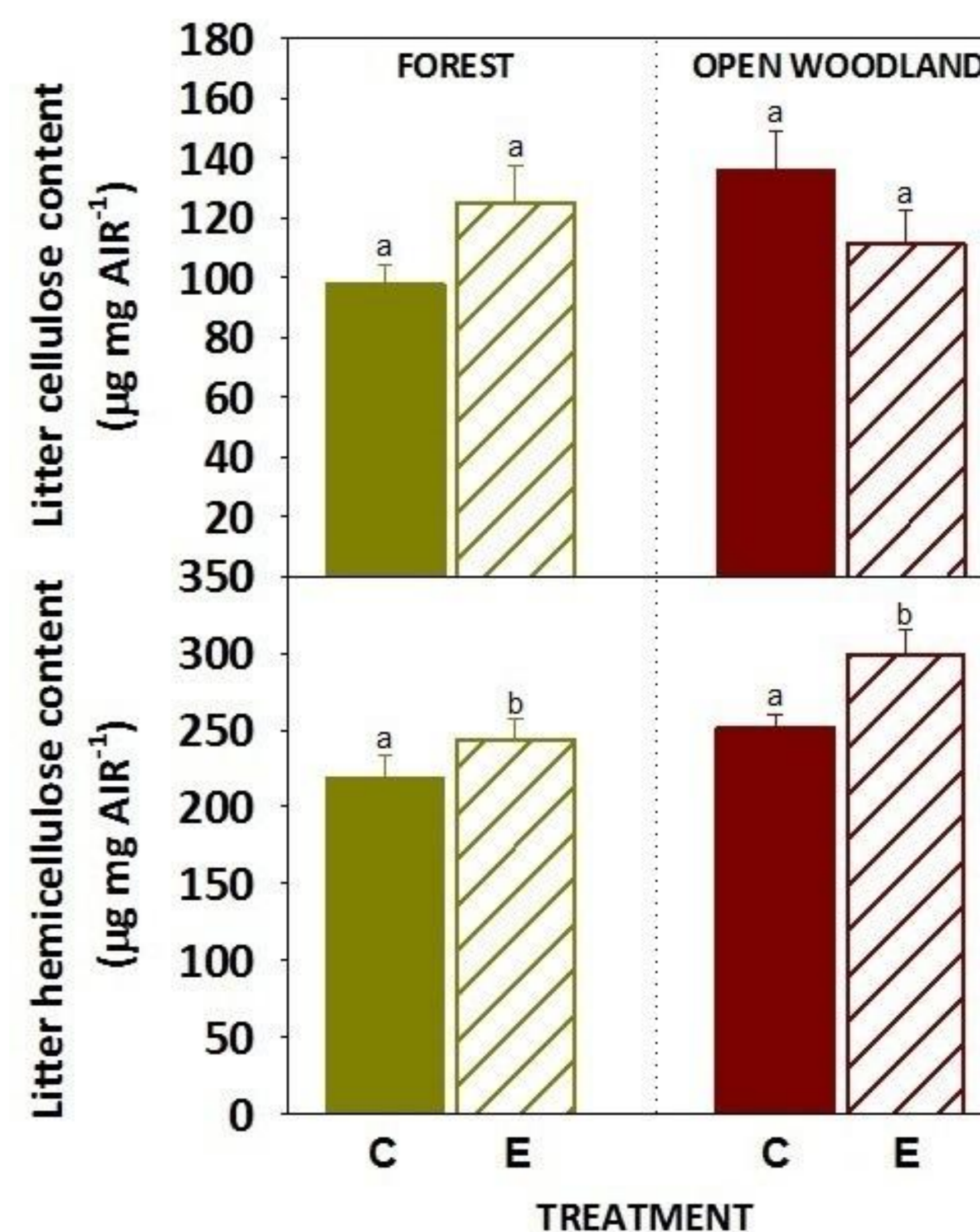


Fig. 4. Mean and SE (n=4) of cellulose and hemicellulose (µg per mg of alcohol-insoluble residue (AIR)).

Table 1. ANOVA results for management and grazing effects on main leaf chemical components (*p<0.05; **p<0.005; ns = non-significant).

Factors	C	N	Cellulose	Hemicellulose	Phenols
Management	**	**	ns	*	ns
Ungulates	**	**	ns	*	**
Interaction	**	ns	*	ns	ns



CONCLUSIONS

- Both, forest management and presence of ungulates have a great impact on litter quality, particularly on C, N content and C/N ratio.
- Cellulose and hemicellulose showed different responses to these factors, indicating a change in cell wall structure.
- Phenols were much higher in absence of ungulates, maybe due to an increment in grazing pressure from smaller herbivores.

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