

## Diversity of invertebrates associated with dung patches in two livestock systems

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**Introduction** The dung patches represent habitats for invertebrates of sanitary and ecological importance in livestock. The ectoparasites *Haematobia irritans* (horn fly) and others organisms use the feces as place for shelter, reproduction and feeding establishing interactions of competition, parasitism and predation. The silvopastoral system (SPS) is characterized by cultivation of tree species associated to pasture and cattle. The microclimate variation and high diversity of organisms in the SPS contribute to the complexity of ecological interactions in this environment, comparing to conventional grazing system (CGS). This study aimed at evaluating differences in the invertebrate fauna associated with dung patches from cattle raised in SPS and CGS.

### Material and Methods

The work was carried out at Embrapa Southeast Livestock located in São Carlos, SP., from 2013 to 2015. During the seasons of year, the invertebrates were sampled in feces of seven or 14 days, excreted by Canchim steer kept on pasture of *Brachiaria decumbens* in the SPS and CGS. The dipterous were sampled through the flotation of pupae present on feces (Marchiori et al., 2001). The pupae were incubated for hatching of flies and parasitoids. The predators and decomposers were sampled in Berlese funnel. Data were submitted to statistical analysis (ANOVA and Student-Newman Keuls,  $p < 0.05$ ) and the diversity was estimated by the Shannon-Weaver index ( $H'$ ).

### Results and Conclusions

Six fly morphological species were verified in association with feces - Muscidae (3), Sarcophagidae (2) and Fanniidae (1). The horn fly was identified between the Muscidae and the parasitoid *Aphaereta* sp. (Braconidae) was the most common. The predaceous and decomposers fauna was composed by Coleoptera (Scarabaeidae, Histeridae, Anthicidae, Carabidae and Staphylinidae); Diptera (Stratiomyidae); Hemiptera (Anthocoridae); Dermoptera (Labiduridae); Hymenoptera (Formicidae), Isoptera (Termitidae) and Arachnida (Acari and Araneae). The highest densities of dipterous pupae occurred during spring and summer (Table 1). The number of pupae and adults of flies was similar for the both systems. However, the parasitism level of pupae and the diversity of invertebrates were highest on SPS (Table 2). This indicates that the ecological interactions occurring on SPS can contribute for the equilibrium of ectoparasite populations like the horn fly.

**Table 1** Means of fly pupae (FP) in function of systems and seasons of year.

Season	Pupae number*	
	SPS	CGS
Winter13	13.0 bc	18.5 ab
Spring13	59.5 a	44.2 a
Summer13	25.9 ab	16.2 ab
Fall14	6.5 c	4.2 b
Winter14	1.9 c	0.0 b
Spring14	75.5 a	100.0 a

**Table 2** Means of fly pupae (FP), fly adult (FA), pupae parasitism (PP) and diversity index Shannon-Weaver ( $H'$ ).

System	Variables			$H'$ index	
	FP <sup>ns</sup>	FA <sup>ns</sup>	PP(%)*	spring	summer
SPS	30.0	10.6	9.3 a	2.5	1.4
CGS	30.5	8.5	1.2 b	2.1	0.5

<sup>ns</sup> no significance  $p > 0.05$ .

\* significance by Student-Newman-Keuls ( $p < 0.05$ ).


### Reference cited

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