

COMMENTARY

## The carnivorous predatory guild of central Chile: a human-induced community trait?

El gremio de depredadores carnívoros de Chile central:  
¿un atributo comunitario inducido por el hombre?

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ABSTRACT

The hypothesis that the carnivorous guild of predators of central Chile results from the human alteration of the predators' food supply is advanced.

Key words: Chile, guild, human disturbance, predators.

RESUMEN

Se plantea que el gremio de depredadores carnívoros de Chile central es un resultado de la modificación de la oferta de alimentos, producto de la perturbación humana del matorral esclerófilo.

Palabras claves: Chile, gremio, perturbación humana, depredadores.

Raptor species generally are opportunistic hunters, concentrating on the most abundant prey locally available within certain size ranges (Jaksić 1983, Jaksić & Braker 1983). The reliance on a few abundant prey items determines high food overlaps, which characterize the trophic guilds of predatory assemblages (Jaksić 1983). Guilds, then, emerge as an epiphenomenon from the response of the local predators to prey abundance levels (Jaksić *et al.* 1981a).

Three hawks (*Buteo polyosoma*, *Gera-  
noetus melanoleucus* and *Parabuteo uni-  
cinctus*) together with a fox (*Dusicyon  
culpaeus*) form a carnivorous guild within  
the predatory assemblage of central Chile  
(Jaksić *et al.* 1981a). These predators are  
diurnal, hunt in open shrubland patches,  
and exhibit high food overlap (> 90%),  
resulting from their reliance on the rodent  
*Octodon degus* as primary prey. *Octodon  
degus* alone comprises from 41 to 65% of  
the total prey items of *B. polyosoma*  
(57.6%), *G. melanoleucus* (57.7%), *P. uni-  
cinctus* (64.5%) and *D. culpaeus* (41.2%)  
(Jaksić *et al.* 1981a).

*Octodon degus* is indeed the most  
common small mammal species in central  
Chile today (Woods & Boraker 1975, Miller  
& Rottmann 1976, Mann 1978). I have  
recently argued that the current high abun-  
dance of *O. degus* in central Chile results  
from the historical human degradation of  
the native vegetation (Simonetti 1986a).  
*Octodon degus* is more common in open  
and/or disturbed shrublands than in dense-  
ly covered areas (Glanz 1977, Le Boulengé  
& Fuentes 1978, Jaksić *et al.* 1981b,  
Simonetti 1986a). For instance, *O. degus*  
is absent or almost absent from shrubland  
patches with 80% or more shrub cover,  
accounting for only 20% of the small  
mammals captured in undisturbed  
shrubland patches with 40% shrub cover,  
but for 79% or more of the small mammals  
in disturbed patches with 40% shrub cover  
(Glanz 1977, Jaksić *et al.* 1981b, Meserve  
*et al.* 1984, Iriarte *et al.*, in press, Simonetti  
& Fuentes, unpublished; see also Zunino &  
Vivar 1986). As the original scrub vegeta-  
tion becomes more sparse owing to wood-  
cutting and other human uses, *O. degus*

become progressively more abundant in both space and time as compared to other syntopic small mammals (Simonetti 1986a). Further, the population levels of *O. degus* are more constant than those of syntopic small mammals, particularly in disturbed shrublands (Iriarte *et al.*, in press), which suggests that *O. degus* is not only an abundant, but also a reliable prey item for local predators.

If the guild structure of predatory species of central Chile depends upon their opportunistic response to prey supply levels which in turn results from the human degradation of the vegetation, it can be argued that the guild based on the exploitation of *O. degus* results directly from the human alteration of the food supply *via* habitat modification. Therefore, human disturbance may be regarded as the ultimate factor governing guild structure of predatory assemblages in central Chile.

Proper testing of this hypothesis, should require analyses of both the response of small mammal assemblages to human disturbance and the numerical and functional response of raptors to changing prey supply. First, the causal relationship between the dominance of *O. degus* and the degree of human disturbance should be experimentally demonstrated. So far, changes in structural patterns of small mammal assemblages as related to disturbance are based on correlations derived from natural experiments (e.g., Simonetti 1983), but their causality remains to be properly established. Such long term experiments are underway<sup>1</sup>. At the same time, temporal changes in the structure of small mammal assemblages as related to the introduction of agriculture both by native indians and by Spaniards are being evaluated in zooarchaeological analyses<sup>2</sup>. If the abundance of *O. degus* results from human alteration of the shrublands, this species should become progressively more common in the zooar-

chaeological record and should become dominant when the shrub cover of a dense and undisturbed shrubland patch is experimentally reduced<sup>1, 2</sup>.

Second, if human modification of the shrublands increases their profitability to predators by increasing the abundance of suitable prey items, those predators should either concentrate hunting in those profitable patches and/or exhibit a reduction in their trophic niche breadth as they concentrate hunting effort on a few (or a single) abundant prey items. Available evidence suggests that raptors do concentrate in areas of higher prey abundance, including human disturbed areas (e.g., Larraín 1939, Schlatter *et al.* 1980, Jaksic *et al.* 1981a). Evidence also suggests that predators do change their diet opportunistically according to changes in prey supply, including human-induced variations in prey availability (e.g., Simonetti 1986b). Further, long-term observations are underway to analyze the relation between predators' niche breadth and prey supply levels, as required for testing my hypothesis (FM Jaksic 1987, personal communication).

In any event, human disturbance regimes should be considered when assessing the trophic ecology of opportunistic hunters in central Chile.

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