

## Assemblages of Coprophilous Beetles (Insecta: Coleoptera) in the Pastureland of Central Mongolia

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### Abstract

Results of studies on species composition, abundance and community structure of beetles found in dung of the reintroduced wild horses (Przewalski's horses), domestic horses and cattle are presented. Beetles were collected using pitfall traps baited with fresh dung as an odor attractant. Four species of dung beetles, *Aphodius erraticus* (Linnaeus, 1758), *A. subterraneus* (Linnaeus, 1758), *Gymnopleurus mopsus* (Pallas, 1781), *Onthophagus gibbulus* (Pallas, 1781), one species of rove beetle, *Staphylinus dauricus* Mannerheim, 1830, and another species of burying beetle, *Nicrophorus argutor* Jakovlev, 1890 are found. In most dung, the lamellicorn beetle species, namely *O. gibbulus*, *A. erraticus* and *G. mopsus* are dominated, which composed up to 80% of all entrapped beetles. The two species of rove and carrion beetles, *S. dauricus* and *N. argutor* were less numerous in traps, although the first species abundantly occurs in exposed horse dung. Study sites with little or no grazing differ from intensively grazed pastures not only by higher diversity of coprophilous beetles, but also in the greater number of dominating species, as well as their abundance. Significant negative correlations were found among the species richness, abundance of coprophilous beetles and number of herbivore droppings.

**Key words:** coprophilous beetles, community structure, dung, Scarabaeidae, Staphylinidae, Silphidae, pasture, Mongolia

### Introduction

The dung of herbivorous animals represents patchy and ephemeral habitats for some arthropods, mollusks, worms etc. Physical, chemical and biotic conditions in the droppings change relatively slowly and it is more stable inside than the ground surface environment in terms of thermal and moisture factors.

Because of high contents of nutritional components, herbivore droppings constitute attractive habitat for many groups of arthropods, including insects, spiders, pseudoscorpions, centipedes, millipedes, mites, some mollusks, and worms (earth worm, round worm, pot worm etc.), as well as their larvae and nymphs (Makarova, 1992; Pérez-Bañón *et al.*, 2003; Horesntein *et al.*, 2007).

The characteristic pattern of the coprophilous insect communities in temperate regions is dominance of dung beetle species (Scarabaeidae), especially small- to medium-sized members belonging to the genera *Aphodius* and *Onthophagus*. Almost all dung beetles are

coprophagous, however some of them are found to be saprophagous, e.g. numerous species of the subfamily Aphodiinae (Hanski, 1980; Hanski & Cambefort, 1991; Liybechanskii & Smelyanskii, 1999).

Beetles belonging to the family Staphylinidae are mostly predators, but it encompasses many saprophagous and coprophagous species, hence they occur in a wide range of habitats including herbivore droppings, manure, animal nests etc. In the meantime, the carrion beetles have a complex position in the food web as they are necrophagous, and are most common on carrion, but some occur in decomposing vegetation and animal droppings. Adult carrion beetles are largely predaceous on developing fly larvae in the dropping prior to burying the carrion (Cambefort & Hanski, 1991; Zunino *et al.*, 1994).

Adults of some species of these beetle groups use dung as a breeding site, and they lay their eggs in the fresh droppings of herbivores to provide food and habitat for the larvae, which inhabit there during its complete developmental period. Both adults and larvae play important roles in