

Chapter 3

Coleoptera associated with vertebrate necromass and dung

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Summary

Coleoptera (primarily the families Silphidae, Leiodidae, Geotrupidae, and Scarabaeidae), were sampled from vertebrate carrion and dung at three sites in Ganzi Prefecture, Sichuan Province, China between 21 August and 9 September 2005. The sites sampled were: (1) Danba County, road S of Donggu town (2-17 km S) along Kui Yong creek valley (2) Kangding County, Pengta Town, Tongling village road up Zhong Gu Lou gou Valley, and (3) Yajiang County, Valley S of Decha village. Identifications to genus or species rank were accomplished for 672 beetle specimens that represent 42-43 species, of which 10-11 are undescribed (24%). These were distributed among the following families: Silphidae (13-14 species, 1-2 new), Leiodidae (9 species, 7 new), Geotrupidae (6 species, 1 new), Scarabaeidae (14 species, 1 new).

Fourteen of the 32 described species (44%) are known only from records in China and are, therefore, possibly endemic to China – five of which are known only from Sichuan Province (16%). Two described geotrupid species known previously only from Yunnan Province are reported from Sichuan Province for the first time (*Enoplotrupes yunnanus* and *Odontotrupes meymintang*). Including the undescribed / newly discovered species, Site 1 had 8 species known only from China, 3 of which were known only from Sichuan Province; Site 2 had 12 species known only from China, 4 of which were known only from Sichuan Province, and Site 3 had 15 species known only from China, 8 of which were known only from Sichuan Province. Site 3 therefore had the greatest counts of species known only from China and Sichuan Province.

Introduction

Carrion and dung associated insect assemblages constitute rich and ecologically important components of terrestrial ecosystems (Puman 1978, 1983; Hanski and Camberfort 1991; Sikes 1994; DeVault et al. 2003). These species remove carrion and dung as food for their offspring and thus increase nutrient cycling (Bornemissza and Williams 1970) while reducing total vertebrate parasite and pathogen transmission (Bryan 1976, Berdela et al. 1994). In addition, they benefit some plant communities by dispersing and burying seeds in dung (Janzen 1982). These insects are relatively easy to sample using baits of their food sources which makes them ideal targets for rapid ecological assessment. Although many insect species can survive in small patches of habitat, dung and carrion feeders are dependent on the continual health of the vertebrates which produce their food – and these larger organisms typically need fairly large and undisturbed patches of habitat. Samples of carrion and dung associated insects therefore provide information on both habitat health, in general, and terrestrial vertebrate community health in particular. Klein (1989) demonstrated that clear differences in the dung and carrion beetle fauna could be detected between plots of forest of different fragment sizes in the Amazon. Forest fragments had fewer species, sparser populations, and smaller beetles than intact forests (Klein 1989).

For this RAP survey we chose to sample carrion beetles of two families: Silphidae and Leiodidae. Dung beetles were sampled from two families: Geotrupidae and Scarabaeidae (although some carrion associated species sometimes visit dung and vice versa).

The beetle family Silphidae contains two subfamilies: the Silphinae which breed using large (>300 g) vertebrate carcasses as resources and the Nicrophorinae which breed using small (<300 g, typically <100g) vertebrate carcasses. These beetles are therefore indicator species of different components of vertebrate communities. They are also, unlike many insects, better represented in the temperate