

## Predation on *Onthophagus rutilans* Sharp (Coleoptera: Scarabaeidae) by *Dindymus albicornis* (Fabricius) (Hemiptera: Pyrrhocoridae)

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**Abstract:** Dung beetles play significant roles in ecosystem services. However, little is known about their predators. In the lowland dipterocarp forests of Johor (Malaysia), three individuals of *Dindymus albicornis* have been found preying on an individual of *Onthophagus rutilans*. This is the first record of a Pyrrhocoridae preying on dung beetle species.

**Key words:** Coleoptera, Scarabaeidae, *Onthophagus*, dung beetles, predators, Malaysia.

**Depredación de *Onthophagus rutilans* Sharp (Coleoptera: Scarabaeidae) por *Dindymus albicornis* (Fabricius) (Hemiptera: Pyrrhocoridae)**

**Resumen:** Los escarabajos coprófagos desempeñan un importante papel en los ecosistemas, y sin embargo es muy poco lo que se conoce de sus depredadores. En un bosque de dipterocarpaceas de Johor (Malasia), tres individuos de *Dindymus albicornis* fueron hallados depredando a un individuo de *Onthophagus rutilans*. Este es el primer registro de un Pyrrhocoridae depredando a un escarabajo coprófago.

**Palabras clave:** Coleoptera, Scarabaeidae, *Onthophagus*, escarabajos coprófagos, depredadores, Malasia.

Dung beetles of the family Scarabaeidae (Coleoptera: Scarabaeoidea) play significant roles in ecosystem services such as nutrient recycling, soil removal and secondary seed dispersal (Nichols *et al.* 2008). However, little is known about potential predators. Some authors have reported dung beetle predation by various animal groups such as insects, reptiles, birds and mammals (Halffter & Matthews, 1966; Hanski & Cambefort, 1991). In Asia, there have been a few records of dung beetle predators, including the Schneider's leafnosed bat, *Hipposideros speoris* (Schneider, 1800), a skink lizard, *Plestiodon chinensis* (Gray, 1838), and two species of tiger beetles, *Cicindela flavomaculata* (Hope, 1831) and *C. whitthilli* (Hope, 1838), without specifying which dung beetle species was predated upon (Pavey *et al.*, 2001; Chen & Jiang, 2006; Sinu *et al.*, 2006).

In February of 2007 (end of wet season), during a study of the dung beetle community in the lowland dipterocarp forests of Johor, south of Peninsular Malaysia, in a pile of 500 g of fresh human dung placed in the forest floor a day before, the second author found, around 9:00 in the morning, three individuals of *Dindymus albicornis* (Fabricius, 1803) depredating at the same time, on an alive individual of *Onthophagus rutilans* Sharp, 1875 (Fig. 1). Bugs are piercing the beetle's exoskeleton at the pronotum using their beaks to suck out the liquids. This behavior was registered during 45 minutes, time in which bugs continued feeding on the beetle. It was not possible to register the attack strategy or mechanisms to determine whether the beetle was hurt before being attracted. It is likely that bugs had been attracted by the presence of dung, seeking to find possible alive preys.

Given that *D. albicornis* is a common species widely distributed in China, Indonesia, Malaysia, Myanmar, Laos Singapore and Thailand (Jackson & Barrion, 2004; Stehlik, 2009), and taking into account the varied feeding habits reported for the genus (Jackson & Barrion, 2004), this species is most likely to be an occasional predator of dung beetles. Despite the presence of *O. rutilans* in a variety of habitats (Praihiaw *et al.*, 2004), it is not a largely abundant species in this type of forest (Davis, 2000; Boonrotpong *et al.*, 2004); thereby, this event is probably unusual.

This is the first record of a Pyrrhocoridae preying on a dung beetle. Particularly in Hemiptera there are some reports of Reduviidae (Halffter & Matthews, 1966; Doube, 1991) but only one with the specific identity: *Apiomerus ochropterus* Stål, 1867 in Panama (Gill, 1991). Although the majority of the representatives of the Pyrrhocoridae family are of phytophagous habits, there are some reports of predation (Ahmad & Schaefer, 1987; Schaefer & Ahmad, 2000). In the *Dindymus* genus, until the moment, very little is known about their potential preys (Jackson & Barrion, 2004).



**Fig. 1.** Three individuals of *D. albicornis* depredating an alive individual of *O. rutilans*, in Johor, southern Peninsular Malaysia.

Some authors consider that predation is not a determining factor in population dynamics of dung beetles (Young, 1978; Hanski, 1989), but Horgan & Berrow (2004) suggested that Hooded crow, *Corvus corone cornix* Linnaeus, 1758, could be an important predator in dung beetle assemblage in temperate pasturelands. Discovering more about how dung beetle predators influence dung beetle assemblages in tropical forests contribute to greater understanding on prey-predator interactions involving dung beetles. Our identification of dung beetle predators is a small step towards understanding such interactions.

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