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Scientific Note

Slug caterpillars of *Parasa lepida* (Cramer, 1799) (Lepidoptera: Limacodidae) become stuck on rose prickles

Plants cope with various natural enemies, ranging from large mammals to microbes and viruses, using physical and chemical defenses. Sharp, stiff structures such as spines, thorns and prickles are effective for deterring large vertebrate herbivores (Janzen & Martin 1982, Cooper & Owen-Smith 1986, Grubb 1992, Gowda 1996). In addition to their anti-herbivore role, these structures are also useful as climbing supports (Darwin 1865; Isnard & Silk 2009), as domatia for mutualistic defending ants (Janzen 1966, 1974), for reducing solar irradiation (Mauseth 2006), for seed and vegetative dispersal (epizoochory) (Allen et al. 1991, Bobich & Nobel 2001), etc. (Ronel & Lev-Yadun 2012 and references therein). Spines, thorns and prickles can mechanically wound mouths, digestive tracts and external body parts of large herbivores (Janzen & Martin 1982, Janzen 1986), but can also inject pathogenic bacteria and fungi into herbivores' bodies (Halpern et al. 2007a, b). Many plants advertise the danger of these sharp structures with conspicuous warning colors (Lev-Yadun 2001, Halpern et al. 2007a, b, Ronel & Lev-Yadun 2012).

In contrast, plant trichomes, which are typically tiny, tender structures, physically deter arthropod herbivores (Levin 1973, Soetens et al. 1991, Valverde et al. 2001, Lill et al. 2006, Løe et al. 2007, Jaime et al. 2013), protect plant tissues from desiccation and irradiation (Ehleringer et al. 1976, Wagner et al. 2004), and can help camouflage plants (Lev-Yadun 2006). Furthermore, stinging trichomes of some plants (e.g., nettles) deter mammalian herbivores (Levin 1973), and grandular trichomes directly prevent insect herbivory and also indirectly deter arthropod herbivores by attracting predators (Voigt et al. 2007, Romero et al. 2008, Krimmel & Pearse 2013).

Parasa lepida (Cramer, 1799) is an exotic insect from southern China, the population of which has increased in central Japan since the 1970s. It typically infests dozens of broad-leaved tree species (Yamazaki et al. 2007, 2013). Rose (*Rosa hybrida* L.) is a familiar ornamental plant that bears beautiful flowers and has sharp prickles. Rose prickles are derived from epidermal tissues (Canli 2003, Canli & Skirvin 2008), and present in various forms and densities among varieties (Debener & Linde 2009). Kellogg et al. (2011) indicated that rose and raspberry prickles are formed by modification of glandular trichomes, and the fact that both glandular trichomes and immature prickles are present on young twigs of Osaka Rose supports this developmental mechanism as well (Figure 1F). We here report that the slug caterpillar *Parasa lepida* (Cramer, 1799) (Lepidoptera: Limacodidae) gets stuck in rose prickles, resulting in death due to immobilization and starvation.

Observations of roses and slug caterpillars were conducted in the rooftop garden of Osaka City Hall (34°41'N, 135°30'E), Kita-ku, Osaka City, central Japan. The garden is ca. 770 m^2 and was constructed in 2003. More than 100 species of trees, shrubs and herbs were planted, and ~180 plant species, including herbs, grasses and tree seedlings, were recruited naturally. 'Rose Osaka'® (Hybrid Tea Rose, ca. 130 cm tall) was cultivated in the southern part of the garden and grown without insecticides or fungicides. Rose Osaka, the symbol of the World Rose Convention in Osaka in 2006, produces large red flowers (Figure 1A) and is covered with dense prickles on its