

Fungi Feeding by the Agreeable Tiger Moth (*Spilosoma congrua* Walker) (Erebidae: Arctiinae)

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FUNGI FEEDING BY THE AGREEABLE TIGER MOTH (*SPILOSOMA CONGRUA* WALKER)
(EREBIDAE: ARCTIINAE)

Additional key words: *Spilosoma congrua*, Agreeable Tiger Moth, mycophagy, fungivory.

Mycophagy in caterpillars from numerous moth families is well known, but for many species, including arctiines, basic information on fungal hosts and feeding behavior is lacking (Rawlins 1984; Wagner et al. 2008; D. Wagner pers. comm.). Although fungi provide nutrients (Jonsell & Norlander 2004; Rawlins 1984), availability of fruiting bodies can be unpredictable, and fungi are often only part of a polyphagous diet (Jonsell & Nordlander 2004).

Many species of caterpillars utilize chemical defenses against predators (Bowers 2009; Hristov & Conner 2005), and parasitoids (Bowers 2009), or use compounds produced *de novo* and/or secondary metabolites sequestered from host plants for reproductive functions (Hristov & Conner 2005; Rawlins 1984; Wagner 2005). Many sequestered compounds have been identified in arctiines (Hristov & Conner 2005; Wagner 2009), including *Spilosoma congrua* caterpillars which are highly effective at sequestering iridoid glycosides (Conner 2009; Hristov & Conner 2005). Other arctiines are known to sequester pyrrolizidine alkaloids (Woolley 2001), azoxyglycosides, lichen phenolics, biogenic amines, iridoid glycosides, pyrrolizidine glycosides and cardiac glycosides (Nishida 2002; Weller et al. 1999; Bowers 2009). A variety of bioactive secondary metabolites are widely produced by fungi (Zjawiony 2004; Mahmood 2010; Kukor & Martin 1987) and although there are few reports that insects sequester fungal toxins (Wicklow 1988), sequestration of fungal secondary compounds from lichens was shown in 24 lichen feeding lithosiines (Hesbacher et al. 1995). The purpose of this note is to document mycophagy in a primarily phytophagous arctiine, *Spilosoma congrua* Walker. Anecdotal and unpublished accounts, coupled with a single-confirmed published report indicate that this caterpillar occasionally feeds on fungi and maybe a useful candidate for exploring fungivory in Lepidoptera.

On 30 July 2010 at 22:15, we observed an Agreeable Tiger Moth caterpillar (*Spilosoma congrua* Walker) feeding on a small bracket fungus on a fallen log in a mature deciduous forest in Community Park, East Brunswick Township, Middlesex County, New Jersey (40.40887° N, 74.44360° W). The caterpillar was observed for approximately five minutes before being collected along with its host fungus. The identification

of the caterpillar as *Spilosoma congrua* was confirmed by David Wagner (David Wagner pers. comm.).

The caterpillar we observed was feeding on the bracket polypore fungus *Trichaptum bifforme* (Fr. in Kl.) Ryvarden (Polyporaceae). The fungus was also covered by two algal species, possibly a *Chlorococcum* (Meneghini) and another unidentified filamentous species (Dorothy Smullen pers. comm.). Our observations suggest that the caterpillar was feeding on the mushroom as well as the algae. The algal consumption may have been incidental to feeding on the mushroom but algivory has been reported in other Arctiidae (Moskowitz & Westphal 2002; Rawlins 1984; Robinson, et al. 2001; Wagner 2005). A short supplemental video of the feeding is available at <http://www.youtube.com/watch?v=uaYkUqQmGG4>.



FIG. 1. Agreeable Tiger Moth caterpillar (*Spilosoma congrua* Walker) feeding on the bracket polypore fungus *Trichaptum bifforme* (Fr. in Kl.) Ryvarden (Polyporaceae) in Community Park, East Brunswick Township, Middlesex County, New Jersey

While the caterpillar was in captivity before succumbing to an unknown cause, it was fed fresh common dandelion (*Taraxacum officinale* F.H. Wigg.) leaves and white clover (*Trifolium repens* L.) leaves. It readily accepted the dandelion but not the clover.

Spilosoma congrua is typically described as phytophagous (Covell 1984; Robinson, et al. 2001; Wagner 2005). There are also a few reports of the caterpillars feeding on mushrooms. We are aware of three published reports that note the caterpillar feeding on the mushroom *Agaricus campestris* L. (Tietz 1972; Handfield 1999; Robinson 2001). It is likely that these three accounts all originated from the same fungal host report noted in Thomas (1939) as originally reported by Beutenmüller (1890) and are also the source of many other general references to this species feeding on mushrooms. Unpublished reports, supported by photographs, also note feeding by *Spilosoma congrua* caterpillars on other mushrooms including *Fomitopsis spraguei* (Berk. & M.A. Curtis) (Fomitopsidaceae) (Woods and Woods 2008) and possibly on *Boletes* sp. (E. M. Fries) (Ramos 2006) (Boletaceae). Sargent (pers. comm.) also observed an unconfirmed *S. congrua* feeding on *Boletus bicolor* Peck. This caterpillar was also offered a *Russula* sp. (C.H. Persoon) (Russulaceae) but feeding on this host was sparse and inconclusive. A few other references note feeding by *S. congrua* on mushrooms but are more general without identification of the species; "feeding in mushrooms" (Beutenmüller 1890), "larva also bores in mushroom stems" (Zhang 1994) and "Attacks mushrooms but is rare" (Thomas 1939).

The paucity of reports of *Spilosoma congrua* feeding on fungi over the past century suggest that fungivory in this species must be only part of a broader generalist diet. It is possible that *Spilosoma congrua* utilizes fungi, when available, as a source of defensive chemicals and/or for reproductive purposes. Despite the limited number of accounts of fungivory in *Spilosoma congrua*, feeding trials with various fungi may be informative and help to understand the ability of the caterpillars to utilize these abundant food sources.

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