Fun With Flea Beetle Feces

David G. Furth, (USA)

Most Flea Beetles (Alticinae) do not have any unusual fecal behavior. Like most insects they defecate whenever and wherever they feel like it. Adults they usually randomly drop feces on the surface of leaves or any other surface they happen to be on. However, there are a few known cases of species or even genera that have special fecal behavior that seem to have some beneficial aspects to them. Probably the best example of such special fecal-frolicking is in the genus *Blepharida* Chevrolat, 1836. As I reported previously (Furth 1982) the female adults of *B. sacra* (Weise) (Sacred Sumac Flea Beetle) cover each small batch of eggs (average 9-10 eggs per batch) with feces that hardens into a sort of "egg case" on the older branches or twigs of its food plant, the *Rhus tripartita* (Bernard da Ucria) (Anacardiaceae) (Fig. 1). The fact that these egg cases are usually on older branches may also protect them from the grazing by goats on the newer, more tender twigs. Because this species usually lives in rather harsh environments (deserts or xeric habitats) the presumption is that this hardened fecal covering (egg case) serves as protection from desiccation or from certain kinds of egg predation (Furth, 1982, 1985). These egg cases may remain on the host tree for several years, indicating the presence of a population of the beetles even during the off-season. The slug-like larvae of *B. sacra* appear somewhat wet or slimy, but actually they only have a very smooth transparent outer integument. They also have interesting fecal behavior in that they retain the feces as long "fecal threads" that extend as very long filaments from the anus, often several times their body length (Furth, 1982) (Fig. 2). It unclear what the purpose of this behavior is, except possibly as some sort of anti-desiccation mechanism. The fecal threads are able to be maintained because of the unusually high position of the anus above the anal proleg in *Blepharida* and its relatives, moreso than in other Alticinae (Paterson, 1931, Furth & Lee (2000). I have observed *B. marginalis* Weise and *B. conradsi* (Weise) in Kenya (Furth & Young, 1988) that exhibited some of the same larval fecal thread behavior, but to a lesser extent. Similar "egg case" and "fecal thread" behavior have been reported for the Australian weevil *Goniopterus scutellatus* Gyll. (Arzone & Meotto, 1978).

Figure 1. Egg of Blepharida sacra *coated with feces*

Figure 2. Larva of Blepharida rhois *covered with feces*

Another "use" of the fecal threads is as indicators for entomologists to locate populations of larvae, because when you see pieces of the fecal threads on leaves of the host, you only have to look on branches above these pieces to find the larvae.

An even better known case is the behavior of *B. rhois* (Forster) the jumping sumac beetle from North America that feeds on several species of sumac (*Rhus*), the larvae of which are well-known to cover themselves in fresh feces giving a wet, sticky appearance (Fig. 3). Morris (1916) said "the larva is one of the most disgusting sights in the insect world". The presumed advantage of this behavior is that a larva completely covered in feces cannot be seen by many potential predators. However, recently, Vencl & Morton (1998) demonstrated that the feces of this species (and presumably others) contains chemical deterrents to ants. Evans et al. (2000) determined that the feces of *B. schletendalii* (Furth) contain some of its host plant chemicals that presumably act as a defense. However, I have not observed these fecal behaviors (fecal threads or fecal shields) in most of the other species of New World or Old World *Blepharida*.

Figure 3. Larvae of Blepharida rhois *covered with feces*

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