

A Comparison of Attractants for Sampling *Stomoxys calcitrans* (Diptera: Muscidae) on Dairy Farms in Saraburi Province, Thailand

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Abstract

The efficacy of different stable fly attractants was evaluated at four dairy cattle farms in Muak Lek district, Saraburi province, Thailand. Dry ice, octenol, a mixture of cow dung and urine, a combination of dry ice plus octenol, and no attractants (control) were tested with Vavoua traps. In total, 7,000 individuals of *Stomoxys* species were collected between July 2013 to September 2014, of which 1,058, 867, 1,274, and 3,801 were trapped on farms 1–4, respectively. Four species of *Stomoxys* were identified: *Stomoxys bengalensis* Picard, 1908, *Stomoxys calcitrans* (L., 1758), *Stomoxys indicus* Picard, 1908, and *Stomoxys sitiens* Rondani, 1873. *S. calcitrans* was the predominant species, comprising 99% of all the samples collected. The number of male and female *S. calcitrans* collected differed significantly by attractant type. Significantly more *S. calcitrans* were attracted to dry ice or a combination of dry ice plus octenol-baited traps than to unbaited or octenol-baited traps. The Vavoua traps baited with dry ice alone or a combination of dry ice plus octenol were effective attractants for *S. calcitrans*.

Key words: attractant, dry ice, octenol, *Stomoxys calcitrans*, Thailand

Stable flies (*Stomoxys* spp.) belong to the subfamily Stomoxyinae in the family Muscidae (Diptera). Among the 18 *Stomoxys* species described, six have been recorded in Thailand, with one synanthrope species, *Stomoxys calcitrans* (L.) (Zumpt 1973, Tumrasvin and Shinonaga 1978). Stable flies are an important and widely distributed insect pests of livestock, wildlife, and sometimes humans. Both sexes of adult stable flies are obligate blood feeder that cause painful bites and significant blood loss in some animals. Heavy burdens of biting activity can reduce animal productivity by reducing weight gain and milk production (Bruce and Decker 1958, Campbell et al. 1987, 2001, Wieman et al. 1992, Catangui et al. 1997). Stable flies may act as both mechanical and biological vectors of disease agents, including viruses, bacteria, protozoa, and helminthes (Baldacchino et al. 2013). Examples include equine infectious anemia virus (EIAV; Foil et al. 1983), trypanosomes *Trypanosoma evansi* and *Trypanosoma congolense* (Sumba et al. 1998), and the nematodes *Habronema microstoma* and *Habronema muscae* (Traversa et al. 2008).

Many types of traps have been developed for the survey and control of stable flies (Taylor and Berkebile 2006, Gilles et al. 2007). Two types of Alsynite sticky traps (Williams trap and Broce trap) have been used for sampling stable flies (Williams 1973, Broce 1988). However, one disadvantage of these traps is that they also

catch many nontarget insects (Gilles et al. 2007). The Vavoua trap (Laveissière and Grebaut 1990) is designed for tsetse flies and is used to sample *Stomoxys* spp. in many African countries and is considered the best option for stable fly control (Gilles et al. 2007).

Additionally, attractants can be used in traps to reduce pest insect populations. The use of octenol (a component of cow breath) and CO₂ as attractants increases flight activity and trapping efficacy (Mihok et al. 1995, Schofield and Brady 1997, Schofield et al. 1997). Both traps and attractants do not injure animals or humans or leave harmful residues. They are relatively safe to use, inexpensive, and effective.

Little is known about the efficacy of different attractants for collecting stable flies in Thailand. The present study compared attractants for *S. calcitrans* on dairy farms in Saraburi province, Thailand. The information obtained in this study will benefit fly control programs by improving their effectiveness.

Materials and Methods

Study Sites

Four dairy farms were randomly selected in the Muak Lek district, Saraburi province. Saraburi is located in the central highlands of