

Species Composition and Abundance of *Stomoxys* spp. (Diptera: Muscidae) in Peninsular Thailand

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Subject Editor: Christopher Geden

Received 5 April 2019; Editorial decision 3 July 2019

Abstract

Stable fly collections were conducted to study the species composition and daytime activity of *Stomoxys* spp. (Diptera: Muscidae) in Peninsular Thailand (Songkhla, Trang, Pattalung, Nakon Si Thammarat, and Satun provinces). Vavoua traps were used for fly collections in wet and dry seasons each year. Four *Stomoxys* species were found, *S. calcitrans* (L.) (Diptera: Muscidae) being the most common with 2,512 specimens (87.43% of captures), followed by *S. indicus* (Picard) (Diptera: Muscidae) with 306 specimens (10.65%), *S. sitiens* (Rondani) (Diptera: Muscidae) with 44 specimens (1.53%), and *S. uruma* (Shinonaga and Kano) (Diptera: Muscidae) with 11 specimens (0.39%). Subsequently, Songkhla Province was further selected to be a potential collection site to conduct a 1-yr abundance study, due to mixed crop-livestock farming in one place. *Stomoxys calcitrans* was predominant from 0800 to 1000 h with 4,921 specimens (93.6%) while *S. indicus* with 317 specimens (6%) and *S. sitiens* with 19 specimens (0.4%) were numerically dominant from 0600 to 0800 and 1600 to 1800 h. A proportion of male and female of each species was also established. This overall finding could be used as an ideal for nationwide species distribution status for the guidance of appropriate fly control. This information can lighten the way for the future control measures program activity of stable flies in Thailand.

Key Words: species composition, abundance, daytime activity, stable fly, Peninsular Thailand

The stable flies are insects in the subfamily Stomoxyinae and genus *Stomoxys*, comprising at least 18 species (Zumpt 1973). Stable flies are the source of economical defeat in the cattle industry and strongly impact livestock, wildlife, and even humans if their hosts are absent (Foil and Hogsette 1994, Tainchum et al. 2010, Changbunjong et al. 2012, Keawayup et al. 2012). The bite causes pain and annoyance to the livestock, leading to the loss of blood, weight, and lactation (Bishopp 1939, Campbell et al. 1987, Campbell et al. 2001, Showler and Osbrink 2015). Some are vectors and carriers of pathogens to develop some diseases that cause problems to the animal productive system (Changbunjong et al. 2012). Stable flies have been implicated as mechanical vectors of pathogens (Masmeatathip et al. 2006a, Muenworn et al. 2010b, Baldacchino et al. 2013), i.e., *Trypanosoma* spp. (Rodríguez et al. 2014), *Anaplasma marginale* (Scoles et al. 2005), as well as different viruses such as Equine infection anemia virus (Foil et al. 1983, Leroux et al. 2004), African swine fever virus (Mellor et al. 1987), West Nile virus (Johnson et al. 2010, Doyle et al. 2011), Rift Valley virus (Hoch et al. 1985), Lumpy skin disease virus (Chihota et al. 2003, Kahana-Sutin et al. 2017),

Bovine herpesvirus, and other bacteria (*Bacillus anthracis*) to some host animals. The estimate of economic loss in the United States caused by stable flies was placed at US\$2.2 billion per year (Taylor and Berkebile 2008). It can also cause serious problems for tourists on beaches (Kaufman and Weaver 1997). Six species of stable flies such as *Stomoxys calcitrans* (L.) (Diptera: Muscidae), *S. bengalensis*, *S. uruma* (Shinonaga and Kano) (Diptera: Muscidae) (*Shinonaga and Kano*) (Diptera: Muscidae), *S. indicus* (Picard) (Diptera: Muscidae), *S. sitiens* (Rondani) (Diptera: Muscidae), and *S. pullus* were recorded in Thailand (Phasuk et al. 2013). *Stomoxys calcitrans* was considered as the most abundant because its population was found the greatest in dairy farms (Muenworn et al. 2010b, Changbunjong et al. 2012), which are located mainly in the central and north-eastern Thailand. Such favorable habitats are limited in other parts of Thailand (Masmeatathip et al. 2006a, Muenworn et al. 2010b).

Due to the recent economic collapse and world economic fluctuation, the local palm oil and rubber markets have tremendously dropped. For this reason, most local farmers seek their new jobs from other agricultural practices to increase their income. This rapid