

New video registration of *Autographa pulchrina* (Haworth, 1809) (Lepidoptera, Noctuidae) and *Sphinx pinastri* L., 1758 (Lepidoptera, Sphingidae) pollinating *Platanthera bifolia latiflora* (Orchidaceae) in Norway

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In the Orchidaceae family, many species have a highly specialized floral structure and floral fragrance due to interactions with specific pollinators. Pollinators foraging on orchids have traditionally been monitored by detecting pollen vectors on insects, recording tracks from the moths on the orchids, and by direct observations. In the present study an event triggered video system to monitor *Platanthera bifolia* (L.) L. C. Rich. ssp. *latiflora* (Drejer) Løjtnant. to video register pollinators were used. A total of 16 days of monitoring were conducted, whereas only three nights had visits. Four of the visitors were identified as *Sphinx pinastri* (L., 1758) and two were identified as *Autographa pulchrina* (Haworth, 1809). The visits took place during the night (time-range CET (GMT+2) 21:20–01:16). Observations from the video recordings showed that *S. pinastri* approached and hovered in front of the inflorescence and inserted their proboscises into the spur of the flower, while hovering *S. pinastri* didn't need support by their forelegs to insert their proboscises into the spur. From the recordings both species approached the inflorescence with an uncoiled proboscis, further the proboscises were uncoiled while they hovered from flower to flower.

Key words: *Autographa pulchrina*, digital video monitoring, flower visit, motion detection, pollination, *Platanthera bifolia*, Lepidoptera, Noctuidae, *Sphinx pinastri*.

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Introduction

The co-evolution between flowering plants and flower visiting insects have fascinated scientists for decades (e.g. Darwin 1877, Wiebes 1979, Schemske & Hortvitz 1984, Thompson & Cunningham 2002, Ramirez *et al.* 2011). In the Orchidaceae family, many species have a highly specialized floral structure and floral fragrance due to interactions with specific pollinators (Darwin 1877, Wasserthal 1997, Whittall & Hodges 2007). Pollinators foraging on orchids have traditionally been monitored by indirect

methods, such as detecting pollen vectors on insects and recording tracks from the moths on the orchids (Darwin 1877, Nilsson 1983, Maad & Nilsson 2004), or by direct observations (Robertson & Wyatt 1990, Raguso & Willis 2005, Peter *et al.* 2009) and more recently by continuous video surveillance (Micheneau *et al.* 2008). Direct observations and continuous video monitoring of orchids with low visitation rates in nature is time consuming. Although a more efficient system has been used to monitor flower visiting insects, this system consists of a video motion detection (VMD). The VMD