Description and occurrence of the summer and winter phenotype of *Drosophila suzukii*

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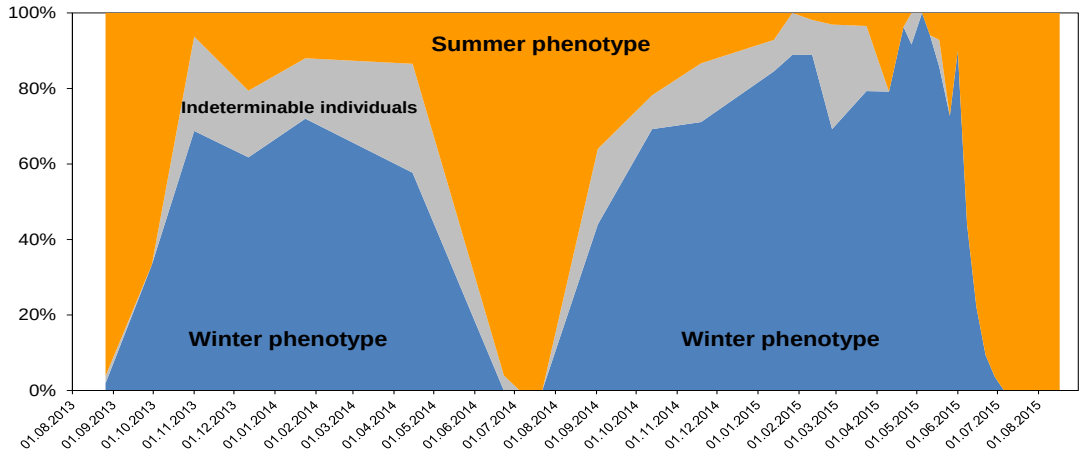

Fig. 2. Ratio of the two phenotypes over the sampling period.

Introduction

Unlike *Drosophila suzukii* females, males possess a black spot at the end of wings. Beside this sexual dimorphism, observations in the US indicate the presence of two distinct phenotypes. Here we test if such a differentiation is also observable in Switzerland and how it manifests over the season.

Material and methods

Insects collected around Gland (VD) from August 2013 to August 2015 were examined. In a first step, we compared individuals captured in the middle of winter and summer with each other in order to identify morphological differences. According to Shearer et al. (2014) the coloration was rated visually and the size of individuals was assessed by the measurement of the wingspan. Based on the determined criteria, the occurrence of the two phenotypes was thereafter analysed over the whole sampling period.

Results and discussion

Males and females of the winter phenotype have a considerably darker thorax than adults of the summer form (fig. 1). Whereas females of the summer phenotype have only a dark band at the end of the 4th tergite, the 4th and 5th tergites of the winter form are dark brown to black. However, about 8% of individuals were of intermediate appearance and thus classified as indeterminable. As in the US, the wingspan of the winter phenotype is significantly larger than the one of the summer form ($P < 0{,}001$). Although males are significantly smaller than females ($P < 0{,}001$), there exists no interaction between phenotype and sex ($P = 0{,}53$).

Adults of the winter phenotype appeared in August and dominated the overwintering population (fig. 2). The number of individuals of the summer phenotype began to rise in May, which indicates that *D. suzukii* starts to reproduce already in early spring on so far unidentified host fruits. Although the summer phenotype prevailed in summer, its adults were also captured over the winter.

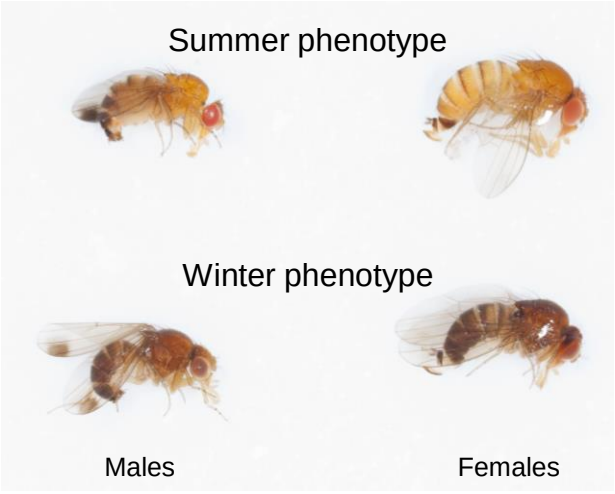

Fig. 1. Characteristic females and males of the two phenotypes.

Summary
Here we confirm observations from the US that there exists a smaller and brighter summer phenotype as well as a larger and darker winter form in *D. suzukii.* Whereas first adults of the winter phenotype appear in August and prevail the overwintering population, the summer form dominates from June to August. Our observations also indicate that *D. suzukii* starts to reproduce already in April on so far unidentified host fruits.