and microorganism are poorly understood. In this study, 13 species of fungi were identified in an artificial diet fed by *D. suzukii*. 8 and 7 species of fungi were identified in cherry and grape fed by *D. suzukii*. Short-term and continuously life table experiments were conducted to determine the impact of three of these fungus species including *Geotrichum candidum*, *Talaromyces minioluteus* and *Actinomucor elegans* on the growth and development of *D. suzukii*. Results revealed that, compared to the control, *G. candidum*, *T. minioluteus* and *A. elegans* increased the mortality of *D. suzukii* adults in the short time, while extended the developmental time of pupal *D. suzukii* by 18.00%, 16.22% and 26.44%, respectively in the life table experiment. *T. minioluteus* reduced the total longevity of *D. suzukii* by 15.52%, while *A. elegans* enhanced the total longevity by 25.96%. *G. candidum* and *A. elegans* increased the fecundity by more than two folds. *T. minioluteus* elongated the mean generation time (T) by 31.34%, whereas *G. candidum* shortened it by 15.26% but increased the net reproductive rate (R0) by 217.76%, intrinsic rate of increase (r) by 88.89% and finite rate of increase (λ) by 9.17%. It was concluded that *G. candidum* and *A. elegans* significantly had a beneficial effect on the growth and reproduction of *D. suzukii*, however, *T. minioluteus* had a negative effect on *D. suzukii*. Our results could provide a new integrated pest management strategy for *D. suzukii* which would be discussed in this study.

Adult reproductive diapause in *Drosophila suzukii* femaless

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Drosophila suzukii (Diptera: Drosophilidae) is an emerging pest of soft fruits, but in this species diapause has not been thoroughly explored. We examined the effects of different temperatures and photoperiods on diapause induction and termination under laboratory conditions. There was variation in ovarian development and oviposition rate under different photoperiods at 10±1°C, and the percentage of adults with immature ovaries was higher during the short photoperiod (8L : 16D) than other photoperiods at 10±1°C. Adults were most sensitive to photoperiod within three days of eclosion. The optimal combination of photoperiod and temperature for diapause termination was long photoperiod (16L: 8D) at 25±1°C. The supercooling point was significantly reduced in reproductive diapause females, and trehalase, pyruvate kinase, sorbitol dehydrogenase, hexokinase and phosphofructokinase enzyme activities were significantly reduced (36.46%, 57.85%, 32.64%, 54.68% and 24.59%, respectively), and glycogen and triglyceride were significantly increased (42.17% and 120.36%). We conclude that *D. suzukii* is a typical short-day diapause species within a certain photoperiod range. This information might contribute to a more fundamental understanding of adult reproductive diapause for this important pest.

Developing a molecular approach to analyze the diet of *Drosophila suzukii*

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Drosophila suzukii is overwintering as adult fly in a reproductive diapause, getting active at mild days in winter and spring. It has a wide range of host plants, mainly identified by oviposition and developmental experiments in fruits. Unfortunately, identifying the nutrition hosts by those methods is challenging, especially in winter. Observations of feeding activity in the field are problematic due to limited access (e.g. forest canopy, shrubberies). The correct identification of moving flies in the field without a stereo microscope is difficult, too. A third problem is that in laboratory feeding-trials insects often feed and/or oviposit on host plants which are not typically used in-field. Thus, there is a big risk of overestimating the range of host plants used by *D. suzukii*. We developed an approach to examine ingested plant DNA in *D. suzukii*. Feeding experiments were established where adult *D. suzukii* from a laboratory colony were fed with raspberry (*Rubus idaeus*), allowing them to digest for up to 72 h. Applying PCR with species-specific primers, the DNA of *R. ideaus* was detectable for up to 48 h post-feeding in whole body extracts of *D. suzukii*. Further, a bleach experiment was conducted to exclude the risk of false-positive detection due to DNA sticking on the flies' body surface. Females fed with *R. idaeus* were contaminated at their tibia or wing-tip with mistletoe (*Viscum album*). Then half of the flies were washed with a bleach-solution and all individuals were tested for DNA of *R. idaeus* and *V. album* again using diagnostic PCR. While the DNA of *V. album* was successfully removed from the fly's body surface, the gut content was not negatively affected by decontamination. In a next step field trapped individuals will be used for next-generation sequencing for further analysis.

Potential geographical distribution of *Drosophila suzukii* based on MaxEnt

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Drosophila suzukii is an important fruit insect pest and its global spread and damage has been paid more attention in recent years. In order to prevent invasion of *D. suzukii* and protect fruit production in China, we studied potential geographical distributions of *D. suzukii* in the world and in China under current and future climate conditions. MaxEnt combined with ArcGIS was applied as technical mode which based on collecting global geographical distributions information and screening main climate variables. Under current climate conditions, *D. suzukii* presented a relative wide potential geographical distribution in the world and 61.68% areas in China with suitability including 7.59% areas of high level, 27.81% areas of medium level and 2628% areas of low level. Under RCP26 and RCP85 climate conditions in 2050, potential geographical distribution of *D. suzukii* enlarged and northern borderline of suitable region expanded northward in the world as well as in China. We suggested related organizations in China to strengthen surveil-