



Effect of moisture and substrate on the survival of early instar black soldier fly larvae in cold storage

CONCLUSIONS

In this study it was found that moisture content of the substrate and aeration play a key role on the black soldier fly early instar larval survival during cold storage. A high mortality across the treatments was most likely due to desiccation, rather than chilling injury. Hence, a moist substrate and air flow might influence the survival of stored larvae positively. These findings show that if stored under adequate conditions, early instar larvae can be stored for up to two weeks. This can help provide a buffer of available larvae to black soldier fly farms.

RESULTS

- Survival rates were influenced by treatment and the time of storage (Figure 1). Samples without substrate or with dry substrate showed no survival, independently from the time of storage tested.
- Larvae stored in sealed containers showed their highest survival rate of 10% after 7 days of storage.
- After 5 days, treatments with intermediate moisture levels of each substrate showed a substantial survival rate; but decreased strongly with the time of storage.
- The survival rate of treatments with substrates at the highest moisture levels was independent from the time of storage.
- The best survival rate was achieved with wheat bran at 60% humidity, with 75% survival after 14 days of storage.

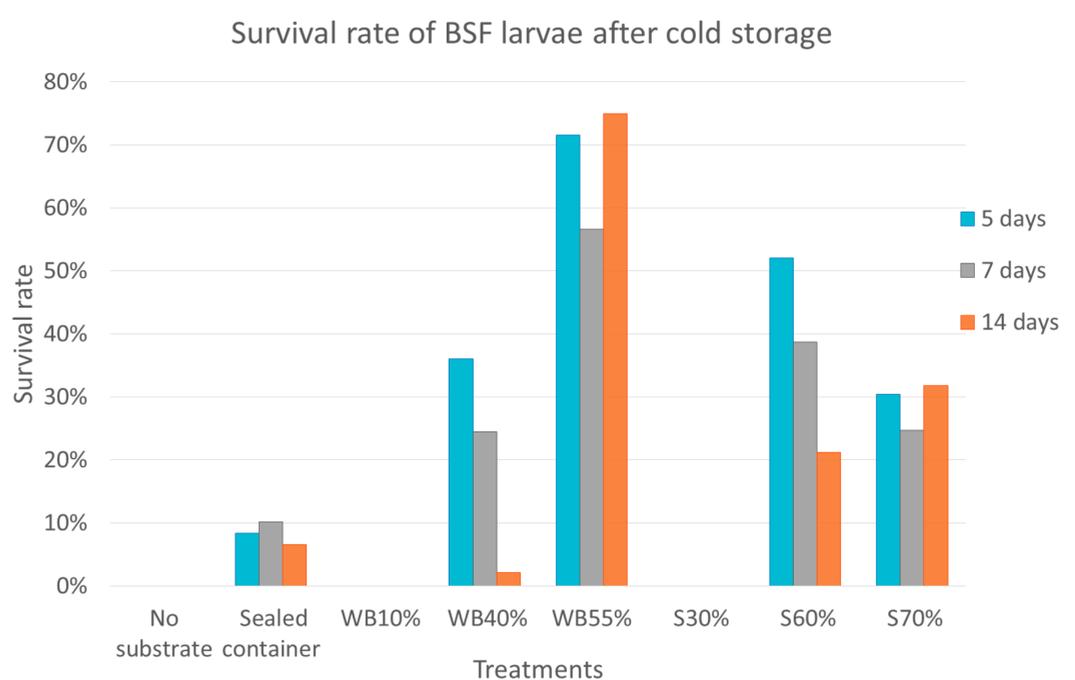


Figure 1. Graphical representation of the survival rate of BSF larvae after 5, 7, and 14 days of storage (blue, grey and orange bars respectively). WB indicates wheat bran, whereas S stands for potting soil.

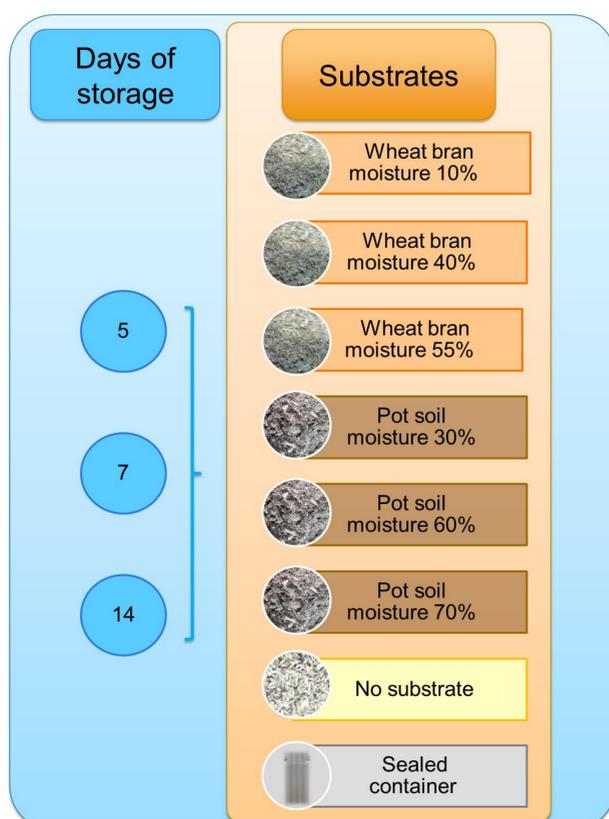


Figure 2. Shows the different periods of storage and treatments. Percentages indicate the moisture levels of substrates.

MATERIAL & METHODS

The 5-day-old larvae of the black soldier fly (*Hermetia illucens*) were stored in open plastic containers in a dark chamber below 15 °C. The experiment included 3 storage periods and 8 treatments, each having 15.000 individuals stored as showed in Figure 2.

After storage larvae were taken out of the dark chamber and fed *ad libitum* with a mix of chicken feed and water (1:2) for 13 days, upon which survival rates were assessed. As a control, the survival of 15,000 larvae from the same batch was assessed in the same way and was found to have a 100% survival.

