

## 2-5. Artificial hibernation for year-round rearing of the bumblebee, *Bombus ignitus*

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Artificial hibernation is essential for year-round rearing of the bumblebee, *Bombus ignitus* that undergoes one generation per year. It is known that keeping the queens in low temperature for two or three months is effective to terminate their diapause and develop the colony. Temperature, time and surroundings to keep the queens during artificial hibernation were investigated. Among the tested temperature,  $-2.5^{\circ}\text{C}$ ,  $0^{\circ}\text{C}$ ,  $2.5^{\circ}\text{C}$ , and  $5^{\circ}\text{C}$ , the optimum temperature was  $2.5^{\circ}\text{C}$ , and at the temperature survival rates after chilling of the queens was highest and colony development thereafter was distinguished. And the proper time to initiate chilling queens was 10 to 14 days after adult eclosion. The survivability of the queens after chilling was good during the upper period. For the surroundings to keep the queens during artificial hibernation was proposed the method to preserve them in a bottle filled with perlite and keep it around 80% R. H.