

The Bumblebee, *Bombus ignitus*, as a Pollinator in Greenhouse

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Introduction of bumblebees to greenhouses for pollination has become widespread in recent 10 years, and the demand is increasing every year. The immense popularity of bumblebees in greenhouses is due to their own merits as pollinators. Out of seven Korean native bumblebees tested, *Bombus ignitus* showed the best results both in artificial multiplication and in pollinating ability. To establish mass production system of *B. ignitus*, we have investigated the mass-rearing and artificial hibernation condition in insectary.

Among 23°C, 27°C and 30°C temperature regimes, 27°C-rearing showed the best results, i.e., the rates of colony initiation, colony foundation and progeny-queen production at the temperature were 83%, 63% and 46%, respectively, which corresponded to 2.2-5.5 times higher values than those at other temperature regimes. On the humidity regimes, 65% R.H. was favorable for a big colony formation. Under the same humidity, the rates of colony initiation, colony foundation and progeny-queen production were 85%, 70% and 50%, respectively, and the number of progenies reached 180±30 workers, 578±179 males and 35±38 queens. Among the tested photoperiod of 0L, 8L and 16L, the oviposition rate and preoviposition period at 8L and 16L were 12-15% higher and 2-3 days shorter than those of 0L. The queen that had the early first oviposition day could make colony stronger and could make colony formation period shorter, therefore, the first oviposition day of foundation queen was proved to be a criterion for selecting super colonies when raising *B. ignitus* indoors. When mated young queens were exposed to 65% or 99% CO₂ for 30 min daily during two consecutive days, the oviposition rate and preoviposition period of CO₂-treated queens were 20-25% higher and 17-18 days shorter than those of CO₂-untreated queens. In helpers, the callow workers of *B. ignitus* and *B. terrestris* showed the most remarkable effects on the oviposition rates to 92% and 88%, respectively. In the number of workers recruited to a foundation queen, two workers showed better effect than one worker on the colony development, with no difference between two and more. For artificial hibernation, 10 to 14 days queens after adult eclosion at the 2.5°C were preserved them in a bottle filled with perlite and keep it around 80% R.H. These results may provide valuable information for mass-rearing *B. ignitus* as a pollinator in greenhouse.