The long-tailed mealybug (Pseudococcus longispinus) is a major agricultural pest to over 26 different plant species. They proliferate both sexually and parthenogenetically, taking approximately 4-6 weeks to reach reproductive maturity. Each adult female can produce 75 to 200 live-young over an average 88 day lifespan. Without effective intervention to counteract proliferation, profits may be lost, entire crops depleted and/or other plants in close proximity affected. Essential oils are a promising means of control as they interfere with the mealybug’s octopaminergic nervous systems, which act as a neurotransmitter, neuromodulator, and neuro-hormone. However, in mammals and fish octopamine is only a trace amine, therefore, essential oils are designated as a reduced-risk pesticide under Health Canada’s Guidelines. There are pest control alternatives such as pesticides, but, these can cause deleterious effects on non-target species and the environment. This research tested the 24, 48 and 72 hour effects of peppermint (Mentha piperita), garlic (Allium sativum L.) and lemon (Citrus limon L.) essential oil on the long-tailed mealybug. Research shows that there is a significant difference between each oil after 24 (ANOVA: F(2,6)=2.76, p=0.007), 48 (ANOVA: F(2,6)=3.45, p=0.001), and 72 (ANOVA: F(2,6)=5.26, p<0.001) hours. Garlic essential oil (LC50 = 1.65%) had the greatest effect on the long-tailed mealybug in comparison to peppermint (LC50 = 19.0 %) and lemon (LC50 = 48.0%) essential oil.