

CHAPTER 3

CONCEPTUAL FRAMEWORK AND RESEARCH HYPOTHESIS

3.1 Conceptual Framework

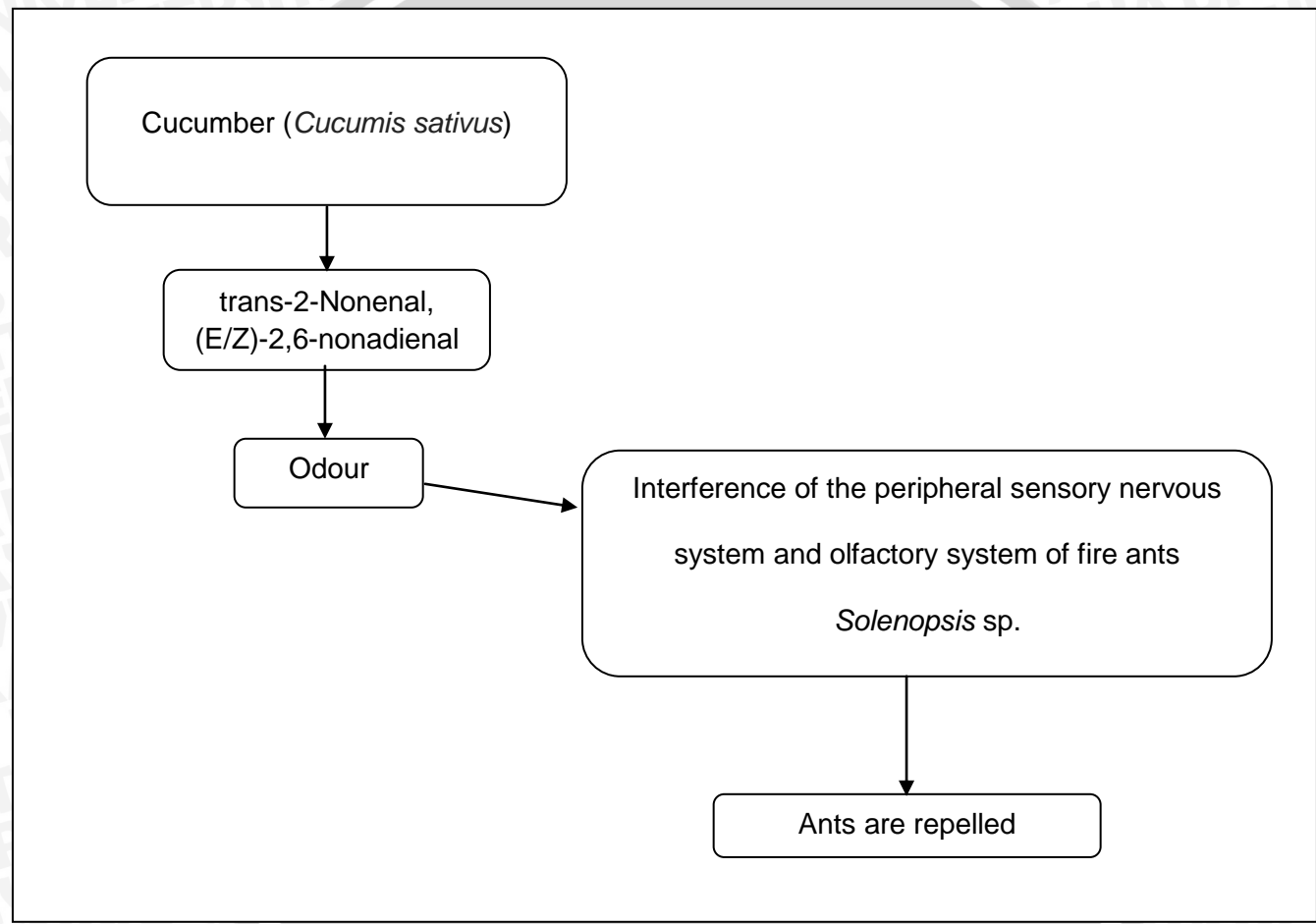


Figure 3.1 Conceptual Framework of the Study of the Potential Repellent Effect of Cucumber(*Cucumis sativus*) towards Fire Ants *Solenopsis sp.*

### 3.2 Explanation

In this conceptual frame wok, there are two concepts working together, (1) the repellent properties of the cucumber and (2) the interference of peripheral sensory nervous system and olfactory system of fire ants (*Solenopsis* sp.)

The cucumber contains may volatile compounds, especially trans-2-Nonenal and (E/Z)-2,6-nonadienal, which produce a specific odour. The odour will stimulate the primary olfactory sensors located in the antennae. The odour will then bind with a specific Odorant-Binding Proteins (OBP) to form OBP complexes. The OBP complexes will trigger an impulse to the brain and the ant will respond to it by avoiding the odour.(Khor,2011)This is how the ants are repelled in this experiment but there is still no researched to approve this repellent mechanism of cucumber on fire ants yet. However, it is well known that cucumber has a high repellent effect on other insects.

### 3.3 Research Hypothesis

1. Cucumber have the repellent effect on fire ants *Solenopsis* sp.
2. The higher the concentration, the higher the repellent effect of cucumber (*Cucumis sativus*) towards *Solenopsis* sp.
3. The longer the duration of the usage, the lower the repellent effect of cucumber (*Cucumis sativus*) towards *Solenopsis* sp.