

CHAPTER I

INTRODUCTION

1.1 Statement and significance of the problem

Strawberry is one of most important economic crop of northern part of Thailand. Strawberry fruits can be sold as fresh fruits and can be processed to many kinds of sweet and drink. Strawberries are also exported as frozen fruits to foreign countries. The strawberry growers earn a good sum of money so they try to keep the quality of their produces with the use of many effective pesticides. But the fruits must be harvested every other day or even everyday if the fruits are ripen too soon due to hot weather. Most common insecticides the strawberry growers used are carbosulfan (changed to carbofuran after spraying to the plan), parathion methyl, and cypermethrin. (Information from Plant Protection Center, Royal Project Foundation: Personal contact). These insecticides are hazardous to the user, consumer and the environment.

Analysis of pesticide residues can be made by many methods. GC and HPLC are commonly used in most laboratories including the Central Analytical Laboratory of Royal Project Foundation. But analysis with the mentioned equipment consumed a lot of solvents, the wastes which are harmful to the environment. CE can be alternative equipment which consumes only small amount of solvent. CE was proved to be suitable for analysis of carbofuran and parathion methyl residues in strawberry fruits before (1). It was also claimed that using CE technique can reduce the amount of organic solvent by 1,000 times when compared with HPLC. More over, extraction and analysis time are much shorter than HPLC and GC, the analysis expense is much cheaper than GC and HPLC.

This research shows a good success of using CE for analysis of the three insecticides commonly used by the strawberry growers. The technique was improved to get rid of the weak point found in previous research (1). The conditions suitable for running the analysis were tried and could be found fit for each insecticide analysis. The amounts of the insecticides detected from using CE analysis were calculated and validated, having high percentages of precission and with significant statistical

confidence: For carbofuran, parathion methyl, and cypermethrin; average recoveries were 99.20 %, 98.40 % and 97.33 % and standard deviations were 0.011 %, 0.097 % and 0.016 % respectively.

It is believed that results from this research will be useful to not only researchers but also to the analysts who are involved with analysis of pesticide residues in strawberry fruits. It is also hoped that there will be more research on using CE for analysis of other plants such as vegetables and various kinds of fruit. Finally, it is expected that CE will be accepted adopted as the technique for analysis of pesticide residues in the future

1.2 Objectives

1. To develop Capillary Electrophoresis (CE) for determining pesticide residue.
2. To analyze pesticide residues of carbofuran, parathion methyl and pyrethroid in strawberry by using Capillary Electrophoresis (CE) and comparing the results with GC and HPLC.