

CHAPTER I

INTRODUCTION

Statement of the study

Tea is one of the most popular beverages in the present and the past. It has been consumed daily in several countries in Asia such as China, Japan and Korea. Most of people in these countries know the best taste and health benefit of the tea drink [1]. Normally, tea drinks are classified into 3 types namely black tea, green tea and oolong tea. Every types of tea are making by plant called *Camellia sinensis*. The classification is indicated by the different of production procedure and the physicochemical properties of tea that is obtained [2]. However, green tea has the most advantages than other teas because it processes a lot of health benefit substances such as catechins that is the potent antioxidant agent. It is stronger than vitamin C and E. There are 4 types of catechins in tea which are (-)-EGCG : (-)-Epigallocatechin gallate, (-)-EGC : (-)-Epigallocatechin, (-)-ECG : (-)-Epicatechin gallate, (-)-EC : (-)-Epicatechin [3]. These compounds are water-soluble and colorless which impart bitterness and astringency to green tea infusion. EGCG is regarded as the most important of the tea catechins because of its high content in tea and the fact that its activity is mirrored by green tea extract [2]. Additionally, several reports are confirming some other activity of green tea such as antibacterial and antivirus. Moreover; the peoples who always drink green tea have lower risk of carcinogenesis. The confirmations from several reports are affect to the increasing of green tea product in the market [2, 4-9].

Although the green tea has high health benefit but they have some problems which affect the product efficacy. This is as the result of less stability of active substances of green tea. The catechins are destroyed by autoxidation and hydrolysis reaction [10]. The reactions occur when the substance contact with water or heat. Normally, EGCG is degraded easily than other compounds. Recent reports revealed the stability of green tea extract is less stable in high temperature and alkali solution. In contrast, the catechins were more stable when temperature and pH decrease [11].

Recently, many research groups attempted to stabilize the catechins, especially EGCG from surrounding environment. It has been reported that antioxidant agents could prevent EGCG from degradation. The EGCG in cosmetic formulation was more stable when antioxidant agent was added. The BHT is the appropriate antioxidant agent for preventing EGCG from autoxidation reaction. The result was compared with other antioxidant agents such as ascorbic acid, propyl gallate. The proper concentration was 0.05 % (w/w)[12]. Nevertheless, the efficacy of BHT was limited by their property. It is hydrophobic compound which prefer to be in oil phase but EGCG is in the water phase. Additionally, recent reports was found that the stability of EGCG was increasing when reduce the free water in formulation. This study used hydrophilic polymer such as carbopol which increased the stability of EGCG by lowering the free water in formulation[13]. However, no report confirms the stability of EGCG formulation in the long term.

Relational of the study

At present, many delivery systems can improve efficacy and stability of bioactive components. These systems can protect the actives from susceptible environment and decrease their degradation. One among these delivery systems is microparticle that is high efficacy for delivering an active ingredient to the target areas. The systems can also show an improvement of stability and reduce influence parameters which lead to instability of activity [14]. From the good advantage of microparticle, therefore, it is appropriate to be used for stabilize green tea active compounds. Catechins in green tea extract is more degraded when contact with water at high temperature, those influence parameters are decrease when catechins is entrapped in chitosan microparticle.

Objectives of the study

1. To determine the possibility of entrapment the green tea extract in microparticles.
2. To evaluate the stability of green tea extract in microparticle under various conditions.

3. To observe the release profile of green tea extract from microparticles.

Expected output of the study

1. The optimum procedure for preparing green tea extract in microparticles.
2. The appropriate system for stabilizing green tea extract.
3. The proper HPLC analysis method for determination the components of green tea extract.

