CHAPTER 5
CONCLUSIONS

The analysis of basic composition of plants, namely fiber content, starch content and volatile oil content, revealed that each part of plant had different compositions. Fiber was found in higher amount in stem and fruit than in other parts; starch was found predominantly in underground part whereas, volatile oil was only found in some plants without any specific part. All herbal powder had the poor flowability and compressibility property. Thus, wet granulation method is the most appropriate process in formulation of herbal powder tablets.

In the formulation study, it was found that talcum and magnesium stearate at concentrations of 3% and 0.5% were sufficient for the tableting process of all formulations. Other important excipients and tabletting conditions can be summarized according to parts used and herbal powder composition as follows:

5.1 Part used

5.1.1 Fruit

The suitable binder for fruit powder formulation is 10% polyvinylpyrrolidone solution, except for *S. trilobatum* in which 10% starch paste was more appropriate binder. MCC was generally required to improve the compactability, except for *S. trilobatum*

5.1.2 Underground part

The suitable binder for herbal powder from underground part was 10% polyvinylpyrrolidone, except for *C. longa* in which 10% gelatin solution was an appropriate binder and *G. glabra* in which 5% starch paste + 5% gelatin solution were found to be an appropriate binder. Appropriate compression force was 20,000 N, except for *E. longifolia* in which compression force only at 15,000 N was sufficient. MCC was used to improve the compactability, except for *E. longifolia*.

5.1.3 Leaf

The suitable binder for leaf powder formulation is 5% starch paste + 5% gelatin solution, except for *P. indica* in which 10% gelatin solution was an appropriate binder and *C. angustifolia* in which 10% starch paste was an appropriate binder. Appropriate compression force was 20,000 N, except for *P. indica* in which compression force only at 15,000 N was sufficient. MCC was used to improve the compactability of all formulation, except for *A. paniculata.* The tablets of *C. angustifolia* had a disintegration problem. Adding 3% croscarmellose sodium could solve this probelm.

5.1.4 Stem

The suitable compression force is 15,000 N, and there is no need to use MCC in the formulation, except for *T. crispa* which required MCC and a high compression force of 20,000 N.

5.2 Herbal powder composition

5.2.1 Plants with large amounts of fiber

The suitable compression force is 15,000 N. MCC was not required in the formulation, except for *T. Chebula.*

5.2.2 Plants with large amounts of starch

MCC was used to improve the compactability, except *E. longifolia*.

5.2.3 Plants with large amounts of volatile oil

MCC was necessarily used to improve the compactability, except for *C. verum* which contains substances such as gum mucilage and resin (Wongratanasathit, 1995) that acts like a binder, thus contributing to harder tablets.

All the tablet formulations developed from this study had the pharmaceutical properties conformed to the standard requirement for the herbal tablets. Therefore, the formulations provided in this study can be used as a fundamental formula in the pharmaceutical industry. In addition, the information from this study can be applied for development of other herbal powder when the parts of plant used or the basic composition of plants are recognized.