

CHAPTER 5

CONCLUSIONS

From this research work the following conclusions can be drawn:

1. The major anthraquinones that naturally accumulated in the leaves of *Senna alata* are rhein and aloe-emodin. The content of aloe-emodin was usually higher than rhein in plantlet.

2. The root culture of *S. alata* was established in liquid B5 medium supplemented with 0.5 mg/l NAA and 1.0 mg/l kinetin. After several subcultures, dedifferentiation of the root culture was observed and the culture was maintained as the cell culture.

3. The root and cell cultures of *S. alata*, which were grown in liquid B5 medium supplemented with 0.5 mg/l NAA and 1.0 mg/l kinetin capable of producing emodin and chrysophanol in higher amount than that produced by the intact plant.

4. The root culture of *S. alata* that established from the high anthraquinone-yielding plants produced emodin and chrysophanol that were sixteen and twenty-six times, respectively higher than that obtained from the low yielding plants.

5. Medium manipulation for an increasing of anthraquinone production in the cell culture of *S. alata* showed that an increasing of NAA and kinetin concentration resulted in decreasing of anthraquinone production.

6. B5 medium supplemented with kinetin 0.5 mg/l was suitable for the anthraquinone production and maintenance of *S. alata* cell culture.

7. Production of emodin was decrease along with the growth of the cell culture, while the production of chrysophanol was started in the late of lag phase and reach to the maximum production in the early linear phase.

8. The total hydroxyanthracene derivative content in *S. alata* cell culture was $0.5 \pm 0.02\%w/w$, which was less than the standard value of $1.0\%w/w$, indicated in the monograph of *S. alata* leaf.