INTRODUCTION

Estrogen deficiency in postmenopausal women causes various health problems, including osteoporosis. Osteoporosis is a result of imbalances between bone formation and bone resorption [1]. Phytoestrogens can be used as an alternative to increase bone formation and overcome estrogen deficiency [2]. Semanggi (Marsilea crenata Presl.) is a plant that contain phytoestrogens [3]. The aim of this research was to investigate the bone formation activity of n-hexane fraction of Marsilea crenata Presl. leaves against hFOB 1.19 cells by observing the expression of osteocalcin, and predicting the phytoestrogen contents of the fraction through metabolite profiling and in silico studies.

RESULTS

Metabolite profiling of n-hexane fraction found 26 known compounds and 14 unknown compounds.

Table 1. Compounds of n-hexane fraction of Marsilea crenata Presl leaves agonist with ER-β

Table 2. In Silico analysis of n-hexane fraction of Marsilea crenata Presl leaves against with ER-β

DISCUSSION

The n-hexane fraction of the Marsilea crenata Presl. leaves are able to increase osteocalcin expression. In this study, increasing the dose was not accompanied by a linear increase in osteocalcin expression, which was due to the non-monotonic dose response (NMDR). NMDR often occurs in research on hormone replacement samples, and is due to differences in the level of affinities between hormones and hormone replacement compound to target proteins such as receptors, cause responses to be difficult to predict despite increased doses of treatments [4].

Identified in the metabolite profiling process which is indicated by the presence of 26 known compounds and 14 unknown compounds. The unknown compounds are those that cannot be identified by the database, which can be in the form of impurity or degradation compounds that are still detected by the instrument. In fact, they could be new and are not yet in the database, especially unknown compounds that have high concentration. In silico test was performed by separating the 17β-estradiol ligand with 1ERE protein. The result show that 10 compounds were predicted by 1ERE agonists [5].

CONCLUSION

The n-hexane fraction of Marsilea crenata Presl. has a bone formation activity through the increased osteocalcin expression and the best dosage at 62.5 ppm by 457.35 AU. There are 10 compounds predicted by 1ERE agonists which have been shown to have similarities with 17β-estradiol. It gives an indication that phytoestrogen content of the n-hexane fraction of Marsilea crenata Presl. leaves have a high potential as a bone formation agent.

REFERENCES