Technical data on the inhibition properties of some medicinal plant extracts towards caseinolytic protease proteolytic subunit of Plasmodium knowlesi

ABSTRACT

Proteolytic subunit of the caseinolytic protease system of Plasmodium knowlesi (Pk-ClpP; EC 3.4.21.92) is considered a viable target for antimalarial drug development to eradicate P. knowlesi malaria infection in Malaysia and Southeast Asian region. Inhibition of this system leads to a disruption in the protein homeostasis molecular machinery and therefore be lethal for the parasite. While plants are considered excellent sources of bioactive compounds exhibiting inhibition activity towards Pk-ClpP, many local medicinal plants remain unexplored. This article expands the data collected from the inhibition properties of the methanolic extract of Asystasia gangetica (Chinese Violet), Alstonia scholaris (Pulai Tree), Piper retrofractum (Javanese Long Pepper) and Small anthus sonchifolius (Yacon) towards Pk-ClpP. These plants are widely found in Malaysia and Indonesia and have been traditionally used in various medical treatments. The present dataset showed that the extracts contained phenolic and flavonoid compounds in various concentrations, whereby S. sonchifolius was found to have the lowest content of phenolic and flavonoid contents, while A. gangetica and A. scholaris were statistically comparable, yet higher than P. retrofactum and S. sonchifolus. Further inhibition data assay towards Pk-ClpP revealed that A. gangetica, A. scholaris and P. retrofactum demonstrated remarkable inhibition activity with IC50 values of 39.06 ± 1.98, 48.92 ± 1.52, and 87.63 ± 3.55, respectively. However, the inhibition activity of these extracts was significantly lower than a serine protease inhibitor of phenylmethylsulfonyl fluoridenone (PMSF). Meanwhile, S. sonchifolus did not exhibit significant inhibition activity towards Pk-ClpP. In addition, Pk-ClpP was not inhibited by a cysteine protease inhibitor of E64