Cloning and expression of oil palm (Elaeis guineensis Jacq.) type 2 ribosome inactivating protein in Escherichia coli

ABSTRACT

EgT2RIP is a type 2 ribosome-inactivating protein isolated from oil palm (Elaeis guineensis Jacq.). Its transcript abundance was reported to be up-regulated in oil palm roots upon inoculation of pathogenic fungus Ganoderma boninense in a recent study. This study aims to produce an active recombinant EgT2RIP protein for biological studies. The DNA fragments encoding Chain A (CA) and Chain B (CB) of EgT2RIP were cloned individually in an expression vector. Soluble CA and partially soluble CB were expressed in Escherichia coli Rosetta-gami 2 (DE3). Purified recombinant CA and CB were associated in a cysteine/cystine reduced/oxidized system, yielding a heterodimer protein (AB). The AB protein showed growth inhibitory activity against breast cancer cell lines (MCF-7) as well as non-tumorigenic breast epithelial cell line (MCF-10A) at IC50 = 1.4 and 10.9 ε g mLī 1, respectively. The active protein produced from this study may have the potential to be used for treatment in medical and agricultural fields.

Keyword: Elaeis guineensis; Ganoderma; N-glycosidase; Oil palm; Recombinant protein; Type 2 ribosome inactivating protein