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Heterologous expression, chaperone mediated solubilization and purification of parasitic nematode-specific growth factor-like protein of *Setaria digitata*

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ABSTRACT

Objective: To clone, express and purify a putative parasitic nematode specific protein of *Setaria digitata*, filarial nematode that infects livestock and cause significant economic losses in Far East and Asia to be used for structural and functional analyses. **Methods:** To characterize uncharacterized gene of *S. digitata* (SDUG), the herterologous expression of SDUG was carried out in the pET [cloned into pET45b(+)] expression system initially and co-expression of SDUG using chaperone plasmids pG-KJE8, pGro 7, pKJE7, pG-Tf2 and pTf16 containing chaperone proteins of dnaK-dnaJ-grpE-groES-gro-E, groES-groEL, dnaK-dnaJ-grpE, groES-groEL-tig, and tig respectively, was carried out subsequently. **Results:** Expression of SDUG was seen when *E. coli* strain BL21(DE3) is used, while concentrating protein largely into the insoluble fraction. The co-expression of SDUG using chaperone plasmid mediated system indicated a significant increase of the protein in the soluble fraction. Of the chaperon plasmid sets, the highest amount of recombinant SDUP in the soluble fraction was seen when pGro7 was used in the presence of 2 mg/mL L-arabinose and 0.6M IPTG concentration in the culture medium and for 3 h of incubation at the temperature of 28 ℃. Recombinant SDUG was purified both from soluble and insoluble fractions using Ni affinity chromatography. SDS-PAGE and western blot analyses of these proteins revealed a single band having expected size of ~24 kDa. **Conclusions:** SDUG seems to be more aggregate-prone and hydrophobic in nature and such protein can make soluble by correct selecting the inducer concentrations and induction temperature and its duration.