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Genome organization and gene expression of a novel unannotated parasitic nematode- specific gene from *Setaria digitata*

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Human lymphatic filariasis in Sri Lanka is mainly caused by the filarial parasite *Wuchereriabancrofti*. Due to paucity of parasite materials of *W. bancrofti* and lack of culture techniques, *Setariadigitata* has been used as a model organism to study filariasis due to its similar characteristics with *W.bancrofti*. As a step towards understanding the biology of this organism, a cDNA library of *S. digitata* was screened and an open reading frame was identified in which the amino acid sequences showed the significant homology to functionally and structurally unannotated sequences of parasitic nematodes *W. bancrofti*, *Brugiamalayi*, *Onchocerca volvulus*, *Loaloa*etc. suggesting its specificity for this group of nematodes. Gene expression analyses revealed that the protein is expressed in both sexes and the microfilarial stage. Southern hybridization studies revealed that this gene is a single-copy gene. Sequence analysis of overlapping genomic regions obtained by PCR amplification using primers derived from exonic regions indicated that the size of the genomic region is 1789 bp of which four exons encoding 205 amino acids were interrupted by three introns of varying lengths of 389, 659 and 123 bp respectively and also the expansion of the size of the introns of *S. digitata* compared to its othologues by integrating micro and mini-satellite containing sequence of (T)_n, (A)_n, (TA)_n, (CA)_n, (AT)_n, (GT)_n, (CAA)_n, (AAT)_n, (TTA)_n, (CTT)_n, (ACA)_n into intronic regions. Sequences around the splice junctions were fairly conserved and agreed with the general *GT-AG* splicing rule. The gene was found to be AT rich with a GC content of 37.9%.Therefore, taking these outcomes together, it can be concluded that *SDUP* is a parasitic nematode specific, single copy gene with four exons interrupted by three intronsand expressed in both sexes and microfilarial stage.