

De novo assembly of the transcriptome of scleractinian coral, *Anomastreaa irregularis* and analyses of its response to thermal stress

Christine A Onyango

Jomo Kenyatta University of Agriculture and Technology, Kenya

Rising seawater temperatures cause coral bleaching. The molecular responses of the coral holobiont under stress conditions, determine the success of the symbiosis. *Anomastreaa irregularis* is a hard coral commonly found in the harsh intertidal zones of the south coast of KwaZulu-Natal (KZN), South Africa, where it thrives at the very margins of hard coral distribution in the Western Indian Ocean. To identify the possible molecular and cellular mechanisms underlying its resilience to heat stress, experimental and control nubbins were exposed to temperatures of 29 and 19 °C respectively for 24 h. The transcriptome was assembled de novo from 42.8 million quality controlled 63 bp paired-end short sequence reads obtained via RNA sequencing (RNA-seq). The assembly yielded 333,057 contigs (>500 bp=55,626, Largest=6341 bp N50=747 bp). 1362 (1.23%) of the transcripts were significantly differentially expressed between heat stressed and control samples. Log fold change magnitudes among individual genes ranged from -4.6 to 7.2. Overall, the heat stress response in the *A. irregularis* constituted a protective response involving up regulation of apoptosis and SUMOylation. Gene ontology (GO) analyses revealed that heat stress in the coral affected the metabolism, protein synthesis, photosynthesis, transport, and cytoskeleton. This is the first study to produce a reference transcriptome of this coral species and analyze its response to heat stress. The assembled transcriptome also presents a valuable resource for further transcriptomic and genomic studies.

Biography

Christine Akoth Onyango holds a PhD in Food Science and Postharvest Technology from Jomo Kenyatta University of Agriculture and Technology; Postgraduate Diploma in (1) Integrated Agricultural Research for Development (Capacity Building and Strengthening Rural populations in Innovation and development) – International Center For Research In development Oriented Agriculture (ICRA), Wageningen, The Netherlands; (2) Advanced Food Technology and Management, Hebrew University of Jerusalem, Israel; MSc. (Food Science and Technology) University of Nairobi; BSc. (Hons) Food Technology and Nutrition, University of Nairobi. A highly qualified and experienced Food Technologist specializing in processing and preservation of food commodities, product development, food hygiene and safety, training at all levels from the community right up to institutions of higher learning. She has a wide experience in R&D, project implementation, monitoring and evaluation.