

## **Codon usage bias and gene expression level in rice under abiotic stress conditions**

Swati Tyagi<sup>1</sup>, Pramod Gorakhanath Kabade<sup>1</sup>, Niranjani Gnanapragasam<sup>2</sup>, Uma Maheshwar Singh<sup>1</sup>, Anoop Kishor Singh Gurjar<sup>1</sup>, Ashutosh Rai<sup>1,3</sup>, Pallavi Sinha<sup>2</sup>, Arvind Kumar<sup>1,4</sup>, Vikas Kumar Singh<sup>1, 2,\*</sup>

<sup>1</sup>International Rice Research Institute, South Asia Regional Centre (ISARC), Varanasi, India

<sup>2</sup>International Rice Research Institute (IRRI), South-Asia Hub, ICRISAT Campus, Hyderabad, India

<sup>3</sup>Banda University of Agriculture and Technology, Banda

<sup>4</sup>International Crops Research Institute for the Semi-Arid Tropics, Hyderabad, India

**\*Correspondence:** v.k.singh@irri.org

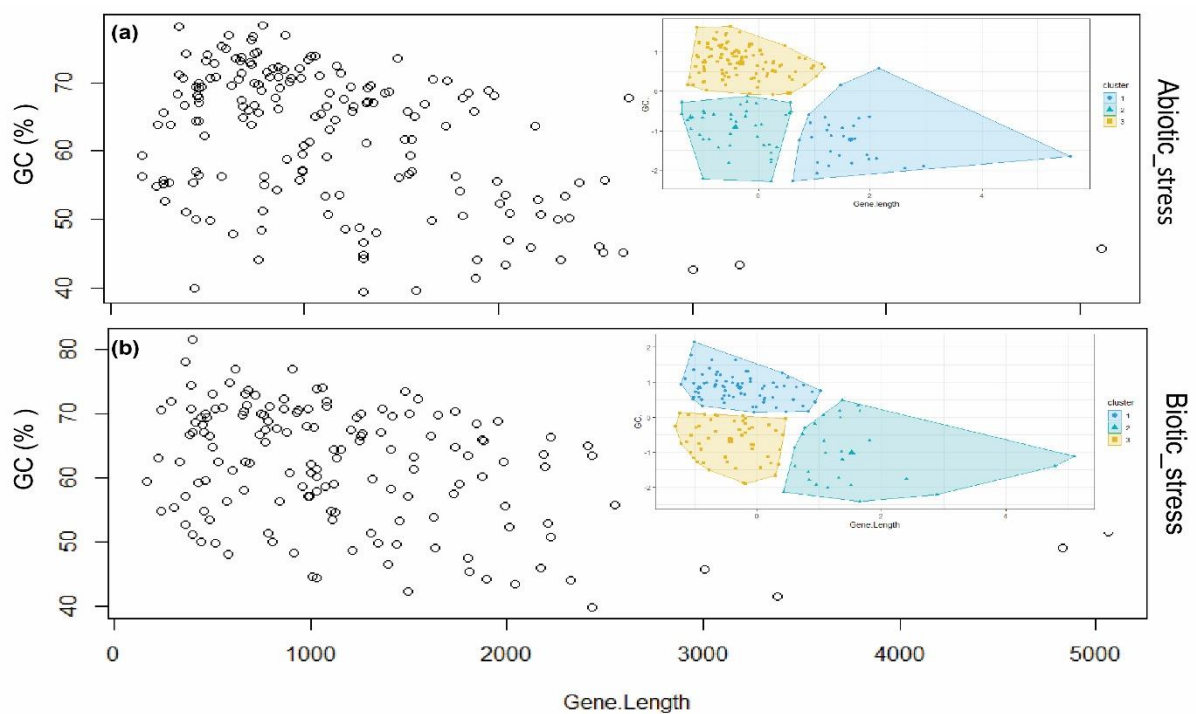
## Supplementary information

### Supplementary figures

**Fig. S1. Nucleotide composition of rice genes expressed under abiotic stress.** (a-c) Upregulated genes (d-f) downregulated genes with low, intermediate, and high expression level respectively.

**Fig. S2. Nucleotide composition of rice genes expressed under biotic stress.** (a-c) Upregulated genes (d-f) downregulated genes with low, intermediate, and high expression level respectively.

**Fig. S3. The Correlation analysis between %GC and gene length.** The gene length and %GC is directly correlated, and the genes are distributed into three different clusters. (a) abiotic stress (b) biotic stress.



**Supplementary Table** (supplied as Excel files)

**Supplementary Table S1** List of SRA libraries, their accession and cultivars used in current study

**Supplementary Table S2.** Differentially expressed genes in rice under abiotic and biotic stress conditions

**Supplementary Table S3.** Sorting, function predication of differentially expressed genes under abiotic stress condition.

**Supplementary Table S4.** Sorting, function predication of differentially expressed genes under biotic stress condition.

**Supplementary Table S5:** Nucleotide composition, CAI and ENC in the genes expressed under abiotic stress conditions

**Supplementary Table S6:** Nucleotide composition, CAI and ENC in the genes expressed under biotic stress conditions