Supplementary Table S1. Rice bioinformatic databases and tools for multiple omics analyses

Tools & Databases	Database description	Reference
RiceSRTFDB	Rice TFs	[1]
STIFDB2	Plant stress responsive genes	[2]
PSPDB	Plant stress related proteins	[3]
QlicRice	Rice abiotic stress responsive QTLs	[4]
RiceNetDB	Rice genome annotated information	[5]
RiceXPro	Gene expression profiles of tissues, organs and hormones	[6]
Stress2TF	Curated stress responsive TF informations	[7]
Plant ontology	Resource of plant anatomy, morphology, growth, and development to plant genomic data	[8]
Phytozome v10.2	Comparative genomic analysis	[9]
PlantPReS	Plant proteome response to stress	[10]
PtRFdb	Plant tRNA-derived fragments	[11]
GRASSIUS	TFs information	[12]
O. sativa genome DB –PlantGDB	EST, cDNA, PUT, and proteins.	[13]
BGI rice Database	Transcriptome analysis, small RNA, sequence alignment, *de novo* genome assembly, functional annotation, evolutionary analysis.	[14]
Rice SNP seek Database	Information for rice genotype, phenotype and variety.	[15]
R-Oryzabase	DNA sequences, literature, phenotype description and classification of rice.	[16]
Integrated Genome Browser	Genomics analytic platform	[17]
Gramene	Comparative functional genomics	
Plant-Reactome Gramene Pathways	Analysis of plant pathways	[18]
Gramene QTL Database	QTL prediction	[19]
Expression Atlas	Annotated gene information	[20]
RAP-DB	Rice genome structure and function	[21]
KEGG	Pathway analysis	[22]
STRING	Protein- protein interaction and gene protein interaction	[23]
MCDRP	Curated rice proteins	[24]
Phospho Rice	Rice specific phosphorylation sites	[25]
funRiceGene	Comprehensive database of functionally characterized rice genes	[26]
PlantCARE and	cis-acting regulatory elements prediction	[27,28]
PLACE		
ExPASy - Protparam	Protein properties prediction	[29]
RiceFOX DB	Hormanome profile	[30]
PPDB	Plant proteomics	[31]
RIPP-DB	Plant phosphoproteome database	[32]
Oryza PG-DB	Rice proteogenomics database	[33]
GOEAST	Gene ontology annotation	[34]
Circos	Comparative genome visualization	[35]
Cytoscape web	Network visualization tool-modelled	[36]
PRIDE inspector	Visualize mass spectrometry (MS) proteomics data	[37]

Supplementary Table S2: Salinity stress responsive genes and its function

Gene	Gene description	Inducible to	Result	Reference
Rab 16A	LEA group of proteins	Drought, Salinity, Cold	Rice plants response to salinity tolerance	[38,39]
GDH	Glutamate dehydrogenase	Salinity, Drought, Cold	Abiotic stress tolerance	[40]
OsNAC2	TF	Salinity, Cold. Drought	Abiotic stress tolerance	[41]
OsMYB6	TF	Drought, Salinity	Salinity tolerance in rice	[42]
P5CS	Pyrroline carboxylate synthetase (proline synthesis)	Salinity	Accumulation of Proline in young cladodes	[43]
Mn-SOD	Superoxide dismutase	Salinity	Salinity tolerance	[44]
GS2	Glutamine synthetase (chloroplast)	Salinity, Cold	Salinity stress and chilling tolerance	[45]
OsCDPK7	TF (calcium-dependent protein kinase)	Salinity, Cold, Drought	Salinity, cold and drought stress tolerance	[46]
OsCDPK			Positive regulation of the stress signaling pathways, increase in salinity, cold and drought tolerance	
Mt1D	Manitol-1-phosphate dehydrogenase (manital synthesis)	Salinity	Salinity tolerance in rice	[47]
codA	Choline synthase (Betaine biosynthesis)	Salinity, Drought	Enhanced enhanced biomass production	[48]
OsNAC5	TF	Salinity, Cold, Drought	Detoxification, redox homeostasis, and macromolecule fortification	[49]
SNAC1	TF (Stress responsive NAC)	Salinity	Salinity tolerance	
DREB1B/CBF1	TF	Salinity, Drought	Salinity and drought tolerance	[50]
DREB1A/CBF3		Salinity	Salinity tolerance	[41]
ZFP179		Salinity	Salinity tolerance	[51]
OsCDPK21	TF (calcium-dependent protein kinase)	Salinity	Positive regulation of stress signaling pathways, increase in salinity tolerance and ABA	[52]
MAPK5	Mitogen-activated protein kinase	Salinity, Cold and Drought	Salinity, drought and cold stress tolerance	[53]
MAPK44		Salinity	Salinity tolerance	[54]
SAPK4	Serine-threonine protein kinase	Salinity	Salinity tolerance in rice	[55]
OsNHX1	Sodium/hydrogen exchanger	Salinity	Salinity tolerance, maintained growth at 200 mM NaCl and increased biomass production	[56,57]
OsSIKI	Stress-induced protein kinase gene 1 (Receptor-like kinases)	Drought, Salinity	Salinity and drought stress tolerance	[58]
OsSIK2	Stress-induced protein kinase gene 2 (Receptor-like kinases)	Drought, Salinity	Abiotic stress tolerance and early leaf development and senescence phenotype	[59]
SOS2	Salinity Overly Sensitive 2	Drought, Salinity	Exchange of Na^+/H^+ in plasma membrane of yeast (*Saccharomyces cerevisiae*) cells and reduced their	[60]

			Na^+ content	
SDIR1	Salinity- and drought-induced ring finger 1	Drought and Salinity	Decrease water loss likely due to their enhanced stomata response	[61]
DSR2	DUF966 stress-repressive gene 2	Drought, Cold, Salinity, Heat, Oxidative	Salinity and drought stress tolerance and decreased ABA sensitivity	[62]
OsNCED3	9-cisEpoxycarotenoid dioxygenase (rice stress-inducible promoter)	Drought, Salinity	ABA biosynthesis, roots and leaves enhancement under drought and salinity conditions	[63]
OsCYP2	Cyclophilin 2	Salinity	Controls ROS level, involved in PEG, heat, cold, or ABA signal pathways	[64]
OsPYL/RCA R5	Pyrabactin Resistance 1 Like/Regulatory Components of ABA receptors	Drought, Salinity	Abiotic stress tolerance in rice, inhibits plant growth, and modulates gene expression	[65]
OsLEA3-2	Late embryogenesis abundant proteins	Drought, Salinity	Elevated growth performance under salinity/osmotic stress conditions	[66]
OsOAT	Ornithine ***δ***-amino-transferase)	Drought, Salinity, Oxidative	Involved in proline (Pro) and arginine (Arg) metabolism, increased δ-OAT activity, glutathione (GSH) and ROS content	[67]
OsSAP	Stress associated Protein	Multiple abiotic stresses including salinity	Induces the ubiquitination, ROS scavenging activities, redox sensing and hormone metabolism	[68,69]

Supplementary Table S3: Salinity stress responsive TFs and their functions

TF Family	Genes	Function	Abiotic tolerance	Reference
bZIP	bZIP23, bZIP71	Increase sensitivity to exogenous ABA at both germination and post-germination stages, improving the stress resistance of crops	Drought, salinity	[70,71]
	bZIP4	Regulates the ABA synthesis development	Salinity	[72]
	bZIP110	Regulating absorption of Na^+ and proline accumulation	Salinity	[73]
	ABF2	Function in osmotic stress signaling	Salinity	[74]
	ABF3		Salinity	
	ABF4	Participate in multiple stress responses	Drought, Salinity, Cold	
	bZIP44,62,78	Differentially regulate expressions of ABA and stress- responsive genes	Drought, Salinity, Cold	[75]
	bZIP132	Reduce ABA sensitivity, increased water loss	Salinity, Drought	[76]
	ABI5	Regulation of adaptive stress response	Salinity	[77]
NAC	NAC29	Improve physiological traits, reduced H_2O_2 accumulation	salinity, drought	[78]
	NAC022	Na^+ accumulation js less in roots and shoots, increases proline and soluble sugar contents	Salinity, drought, and ABA	[79]
	NAC2	Lateral root development and stress tolerance	Salinity	[80]
	NAC019,055,072	Upregulation of stress inducible	Drought, Salinity	[81]
	NAC4	Regulation of plant stresses	Drought, salinity, Cold	[82]
	NAC6	Root system development and yield, regulates the stress tolerance	Drought, salinity	[83-85]
	NAC066	Increases proline and soluble sugar contents	Salinity, H_2O_2	[86]
	NAC2	Stress tolerance	Salinity, Drought	[87]
	NAC4,11,13,24,29,30, 37,47,51, 52,59,69,76,80,86,87,112	Playe a role in abiotic stress tolerance, signal transduction pathway regulation	Salinity, Drought, metal, cold, temperature, UV, flooding	[88]
	NAC032	Promotes senescence and accumulation of H_2O_2, stress tolerance	Salinity, mannitol	[89]
bHLH	bHLH035	Mediates seed germination and seedling recovery	Salinity	[90]
	bHLH22	Increase osmotic potential and accumulation of secondary metabolites	Salinity, Drought	[91]
	bHLH26,87,94,105, 110,116,127,129	Multiple abiotic stress tolerance and transduction signal pathway regulation	Salinity, Drought, metal, cold, temperature, UV, flooding	[88]
	bHLH38	Regulate osmotic balance, stress-induced oxidation damage	Salinity, Drought	[92]
	MYC2	Regulate proline biosynthesis	Salinity	[93]
	MYB6	Elevated CAT and SOD activities,	Salinity, Drought	[94]

		salt stress tolerance		
	MYB91	Rice tolerance to abiotic stress	Salinity	[95]
	MYB15	Enhanced ABA sensitivity, reduced water loss rate, increased ABA biosynthesis	Drought, Salinity	[96]
MYB	MYB76	Stress tolerance and plant physiology processes	Salinity	[97]
	MYB92		Salinity, Cold	
	MYB117		Drought, Salinity	
	MYB76	Response to ionic stresses, stress improve resistance	Salinity	[98]
	MYB3R-2	Increased tolerance to Salt	Freezing, Drought, and Salinity	[99]
	MYB48-1	Increase Salinity tolerance	Salinity, Drought	[100]
	MYB118	Regulate osmotic stress	Salinity, Drought	[101]
CBF/DREB	DREB2	Salinity and dehydration stress in roots and stems, transcript accumulation and alternative splicing regulation	Drought, Salinity, Cold	[102]
	DREB1F, DREB2A, DREB5A & DREB6B	Increased the number of transcripts in roots and stem	Salinity, Cold, Dehydration and ABA	[103]
	DREB1A	Produce transgenic monocots that are tolerant abiotic stress	Cold, Salinity	[104]
	DREB1C		Drought, Salinity, Cold	
	DREB2C	Negative impact of several ABA/stress-responsive genes, involve physical interaction	Cold, Salinity	[105]
	DREB1F	Regulation of ABA-dependent pathway, Stress tolerance	Drought, Salinity,	[106]
AP2/ERF	ERF3	Enhanced resistance to high salinity and dehydration stresses	Salinity, Drought	[107]
	EREBP1,9,10,11,36,39,49,75, 87,104,132,145,147	Multiple abiotic stress tolerance mechanisms and signal transduction pathway regulation	Salinity, Drought, metal, cold, temperature, UV, flooding	[88]
WRKY	WRKY30	Higher antioxidant activities and lower ROS contents, increases soluble sugar and proline contents	Salinity	[108]
	WRKY93	Increase stress tolerance, maintain membrane stability and played a major role superior agricultural trait of SR3 through promoting root development	Salinity	[109]
	WRKY13,54	Abiotic stress response and root development	Drought, Salinity	[110]
	WRKY83	Alterations in physiological parameters such as proline, malondialdehyde (MDA) and electrolyte leakage after stress treatments, increase proline accumulation	Salinity	[111]
	WRKY4,20,25,31,53,68,76, 79,90,103,104	Multiple abiotic stress tolerance mechanisms and signal transduction pathway regulation	Salinity, Drought, metal, cold, temperature, UV, flooding	[88]
	WRKY33	Improved Salinity stress tolerance than the wild type under abiotic stress condition.	Salinity	[112]
	SAP1, 2, 5, 6, 7, 8, 9, 11,	Developmental regulation, signal transduction,	Salinity, Drought, metal, cold, temperature, UV,	[69]

ZF-HD	17	translation, biosynthesis of amino acids, energy metabolism	flooding	
	Zat7	Salinity stress tolerance to transgenic plants, defense response	Salinity	[113]
	CaZF	Potential plant salt-tolerance and osmotolerance determinant	Salinity	[114]
	ZHD10,12,14	Multiple abiotic stress tolerance mechanisms and signal transduction pathway regulation, plant differentiation	Salinity, Drought, metal, cold, temperature, UV, flooding	[88]
HSF	HSF1-25	Transcriptional, post-transcriptional, translational and post-translational activators of abiotic stressors, regulate hormonal signal transduction	Salinity, Drought, metal, cold, heat, UV, flooding	[115]
Others	HARDY	Improves water use efficiency, increase in leaf biomass and bundle sheath cells, stress tolerance	Drought, Salinity	[116]

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