



Figure S1: Histogram plots and density curves of six latent variables. FIt: flowering time; Mrp: morphology; Yid: yield; Grm: grain morphology; Iss: ionic components of salt stress; Msr: morphological salt response.

Table S1: Description of phenotypes used.

Phenotype Label	Category	Description	Publication
Flowering time at Arkansas (Fla)	Flowering time	Number of days until the inflorescence is 50% emerged from the flag leaf counted from the day of planting. Measured in Arkansas, USA	Zhao et al. (2011)
Flowering time at Fairdipur (Fli)	Flowering time	Number of days until the inflorescence is 50% emerged from the flag leaf counted from the day of transplanting. Measured in Fairdipur, BD.	Zhao et al. (2011)
Flowering time at Aberdeen (Flb)	Flowering time	Number of days until the inflorescence is 50% emerged from the flag leaf counted from the day of planting. Measured in Aberdeen, UK.	Zhao et al. (2011)
FT ratio of Arkansas/Aberdeen (Fla)	Flowering time	Ratio of days to heading in Arkansas to days to heading in Aberdeen. Metric used to describe photoperiod sensitivity.	Zhao et al. (2011)
FT ratio of Fairdipur/Aberdeen (Fla)	Flowering time	Ratio of days to heading in Fairdipur to days to heading in Aberdeen. Metric used to describe photoperiod sensitivity.	Zhao et al. (2011)
Year07 Flowering time at Arkansas (Fla7)	Flowering time	Number of days until the inflorescence is 50% emerged from the flag leaf counted from the day of planting. Measured in Arkansas in 2007.	Zhao et al. (2011)
Year06 Flowering time at Arkansas (Fla6)	Flowering time	Number of days until the inflorescence is 50% emerged from the flag leaf counted from the day of planting. Measured in Arkansas in 2006.	Zhao et al. (2011)
Seed length (Sl)	Grain morphology	Length of the seed with hull (palea and lemma)	Zhao et al. (2011)
Seed width (Sw)	Grain morphology	Width of the seed with hull (palea and lemma)	Zhao et al. (2011)
Seed volume (Sv)	Grain morphology	Volume of the seed with hull (palea and lemma)	Zhao et al. (2011)
Seed surface area (Ssa)	Grain morphology	Surface area of the seed with hull (palea and lemma)	Zhao et al. (2011)
Brown rice seed length (Bsl)	Grain morphology	Length of the unpolished rice grain (dehulled seed)	Zhao et al. (2011)
Brown rice seed width (Bsw)	Grain morphology	Width of the unpolished rice grain (dehulled seed)	Zhao et al. (2011)
Brown rice surface area (Bsa)	Grain morphology	Surface area of the unpolished rice grain (dehulled seed)	Zhao et al. (2011)
Brown rice volume (Brv)	Grain morphology	Volume of the unpolished rice grain (dehulled seed)	Zhao et al. (2011)
Seed length/width ratio (Slwr)	Grain morphology	Ratio of seed length/ seed width (with hull)	Zhao et al. (2011)
Brown rice length/width ratio (Blwr)	Grain morphology	Ratio of unpolished rice grain length/grain width (dehulled seed)	Zhao et al. (2011)
Grain length McCouch2016 (Glmc)	Grain morphology	Length of the seed with hull (palea and lemma). Reported by McCouch et al (ISIS1)	McCouch et al. (2016)
Culm habit (Cuh)	Morphology	Average culm angle of plants at maturity	Zhao et al. (2011)
Flag leaf length (Flf)	Morphology	Length of the flag leaf measured at the widest portion of flag leaf lamina (cm)	Zhao et al. (2011)
Plant height (Plh)	Morphology	Height of plant from soil surface to tip of main panicle (inflorescence) (cm)	Zhao et al. (2011)
Shoot BM Control (Sbc)	Morphology	Shoot dry weight (g) for 28 day old plants in control.	Campbell et al. (2017)
Shoot BM Salt (Sbs)	Morphology	Shoot dry weight (g) for 28 day old plants in 9 dS salt.	Campbell et al. (2017)
Root BM Control (Rbc)	Morphology	Root dry weight (g) for 28 day old plants in control.	Campbell et al. (2017)
Root BM Salt (Rbs)	Morphology	Root dry weight (g) for 28 day old plants in 9 dS salt.	Campbell et al. (2017)
Tiller No Salt (Tns)	Morphology	Tiller number for 28 day old plants in control.	Campbell et al. (2017)
Tiller No Salt (Tbs)	Morphology	Tiller number for 28 day old plants in 9 dS salt.	Campbell et al. (2017)
Ht Lig Salt (Hls)	Morphology	Height (cm) from the soil to the ligule of the newest expanded leaf in salt. Measured on 28 day old plants.	Unpublished. Study described in Campbell et al. (2017)
Ht Lig Control (Hlc)	Morphology	Height (cm) from the soil to the ligule of the newest expanded leaf in salt. Measured on 28 day old plants.	Unpublished. Study described in Campbell et al. (2017)
Ht FE Salt (Hfs)	Morphology	Height (cm) from the soil to the tip of the newest expanded leaf in salt.	Unpublished. Study described in Campbell et al. (2017)
Ht FE Control (Hfc)	Morphology	Height (cm) from the soil to the tip of the newest expanded leaf in control. Measured on 28 day old plants.	Unpublished. Study described in Campbell et al. (2017)
Na K Shoot (Ks)	Ionic components of salt stress	Shoot sodium to potassium ratio (10^3) in salt. Measured on 28 day old plants after 14 days of 9dS salt stress.	Campbell et al. (2017)
Na Shoot (Nas)	Ionic components of salt stress	Shoot sodium content (mmol/g dry wt.) in salt. Measured on 28 day old plants after 14 days of 9dS salt stress.	Campbell et al. (2017)
K Shoot Salt (Kss)	Ionic components of salt stress	Shoot potassium content (mmol/g dry wt.) in salt. Measured on 28 day old plants after 14 days of 9dS salt stress.	Campbell et al. (2017)
Na K Root (Kr)	Ionic components of salt stress	Root sodium to potassium ratio (10^3) in salt. Measured on 28 day old plants after 14 days of 9dS salt stress.	Campbell et al. (2017)
Na Root (Nrt)	Ionic components of salt stress	Root sodium content (mmol/g dry wt.) in salt. Measured on 28 day old plants after 14 days of 9dS salt stress.	Campbell et al. (2017)
K Root Salt (Ksl)	Ionic components of salt stress	Root potassium content (mmol/g dry wt.) in salt. Measured on 28 day old plants after 14 days of 9dS salt stress.	Campbell et al. (2017)
Shoot BM Ratio (Sbr)	Morphological salt response	Ratio of the LSMs for shoot dry in salt over control. Measured on 28 day old plants after 14 days of 9dS salt stress.	Campbell et al. (2017)
Root BM Ratio (Rbr)	Morphological salt response	Ratio of the LSMs for root dry in salt over control. Measured on 28 day old plants after 14 days of 9dS salt stress.	Campbell et al. (2017)
Tiller No Ratio (Tbr)	Morphological salt response	Ratio of the tiller number in salt over tiller number in control. Measured on 28 day old plants after 14 days of 9dS salt stress.	Campbell et al. (2017)
Ht Lig Ratio (Hlr)	Morphological salt response	Ratio of height from the soil to the ligule of the newest expanded leaf in salt over control. Measured on 28 day old plants after 14 days of 9dS salt stress.	Unpublished. Study described in Campbell et al. (2017)
Ht FE Ratio (Hfr)	Morphological salt response	Ratio of height (cm) from the soil to the tip of the newest expanded leaf in salt over control. Measured on 28 day old plants after 14 days of 9dS salt stress.	Unpublished. Study described in Campbell et al. (2017)
Panicle number per plant (Pnu)	Yield	Average number of panicles (inflorescences) per plant	Zhao et al. (2011)
Panicle length (Pal)	Yield	Length of panicle (inflorescence) from the base to the tip (cm)	Zhao et al. (2011)
Primary panicle branch number (Ppn)	Yield	Number of primary branches along the panicle (inflorescence)	Zhao et al. (2011)
Seed number per panicle (Supp)	Yield	Number of seeds per panicle (inflorescence), determined by counting the number of filled spikelets along the main panicle	Zhao et al. (2011)
Panicle fertility (Paf)	Yield	Percent of spikelets that filled and produced seeds determined as the ratio of seeds per panicle/spikelets per panicle	Zhao et al. (2011)

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