Table S1. Code, name, pedigree and source of the ten parental maize inbred lines

Parent Code	Name	Pedigree	Source	Reaction to heat stress*
P1	Sakha-95	PASTOR // SITE / MO /3/ CHEN / AEGILOPS SQUARROSA (TAUS) // BCN /4/ WBLL1	ARC-Egypt	T
P2	Gemmeiza-11	Bow"s"/Kvz"s"//7c/seri82/3/Giza168/Sakha 61CGM7892-2GM-1GM-2GM-1GM-0GM	ARC-Egypt	T
P3	Line 112	SOKOLL/WBLL1	CIMMYT-Mexico	M
P4	Line 109	MEX94.27.1.20/3/SOKOLL//ATTILA/3*BCN	CIMMYT-Mexico	T
P5	Line 134	SOKOLL/3/PASTOR//HXL7573/2*BAU/4/WBLL4//OAX93.24.35/WBLL1	CIMMYT-Mexico	S
P6	Line 103	SOKOLL//W15.92/WBLL1	CIMMYT-Mexico	S

*Reaction to heat stress based on stress tolerance index. T= tolerance; M= moderate; S= sensitive

Table S2. Main soil physico-chemical analysis before wheat cultivation at Sakha

Soil depth (cm)	Particle size distribution (%)			Bd (Mg m^{-3})	FC (%)	WP (%)	AW (%)
	Sand	Silt	Clay				
0-20	18.7	31.5	49.8	1.21	43.0	22.0	21.0
20-40	15.7	32.6	51.7	1.22	44.0	22.5	21.5
40-60	16.5	35.1	48.4	1.24	41.7	21.0	20.7

Soil depth (cm)	EC (dS m^{-1})	pH	SOM (%)	Available macronutrients (mg kg^{-1})			HC (cm h^{-1})
				N	P	K	
0-20	3.2	8.1	1.5	45	10.7	249	0.45
20-40	3.4	8.0	1.4	40	9.9	241	0.49
40-60	3.6	7.8	1.1	35	8.5	206	0.38

Table S3. Main soil physico-chemical analysis before wheat cultivation at El-Kharga

Soil depth (cm)	Particle size distribution (%)			Bd (Mg m^{-3})	FC (%)	WP (%)	AW (%)
	Sand	Silt	Clay				
0-20	92.0	1.6	6.4	1.56	18.0	9.0	9.0
20-40	82.0	13.5	4.5	1.58	19.0	9.5	9.5
40-60	85.0	9.7	5.3	1.62	18.7	10.0	8.7

Soil depth (cm)	EC (dS m^{-1})	pH	SOM (%)	Available macronutrients (mg kg^{-1})			HC (cm h^{-1})
				N	P	K	
0-20	1.4	7.1	0.6	18	4.7	129	8.9
20-40	1.6	7.0	0.5	12	3.9	111	7.8
40-60	1.8	7.5	0.4	11	2.2	87	6.7

Table S4. Minimum, maximum and mean values of all the studied traits under two sowing dates across two locations.

Trait	Parameter	Environments								
		E1	E2	E3	E4	L1	L2	D1	D2	Comb.
DTH	Min	87.67	80.33	69.33	58.33	84.00	64.33	82.83	72.83	78.50
	Max	102.67	93.00	82.33	71.00	97.00	76.67	90.00	81.00	85.25
	Mean	97.27	87.71	75.60	65.43	92.49	70.52	86.44	76.57	81.50
PH (cm)	Min	81.58	69.47	76.08	64.08	75.53	70.21	79.08	68.21	81.58
	Max	102.22	89.67	87.42	73.10	95.94	80.10	93.32	79.80	102.22
	Mean	92.21	78.49	81.78	68.43	85.35	75.10	87.00	73.46	92.21
CHLC (SPAD unit)	Min	40.33	36.75	39.75	34.00	39.38	38.04	40.04	37.54	39.01
	Max	49.75	48.08	47.45	45.77	48.64	46.58	48.57	46.63	47.60
	Mean	46.30	42.88	44.25	40.34	44.59	42.29	45.28	41.61	43.44
SL (cm)	Min	12.11	9.59	10.55	8.10	11.11	9.39	12.36	9.52	11.17
	Max	15.30	13.00	15.15	11.84	14.11	13.49	14.19	11.53	12.81
	Mean	13.81	11.49	12.57	9.57	12.65	11.07	13.19	10.53	11.86
NSPP	Min	15.94	13.04	12.80	9.35	14.90	11.08	15.47	12.19	14.12
	Max	25.70	23.17	17.57	15.50	24.43	16.53	20.87	18.17	19.31
	Mean	19.54	16.51	15.30	12.66	18.03	13.98	17.42	14.59	16.00
NGPS	Min	54.33	37.50	38.53	34.87	46.65	38.12	46.43	38.33	42.38
	Max	78.67	71.24	67.25	47.07	74.46	56.57	68.73	55.39	61.51
	Mean	69.84	58.18	51.36	40.27	64.01	45.82	60.60	49.22	54.91
TGW (g)	Min	47.50	31.00	33.90	22.96	39.50	28.94	44.27	30.30	37.29
	Max	60.80	52.10	54.38	39.09	56.25	46.74	57.59	44.76	51.18
	Mean	54.80	43.17	43.76	32.19	48.99	37.97	49.28	37.68	43.48
GYPP (g)	Min	26.56	14.58	12.23	6.13	20.57	9.18	22.32	12.29	18.20
	Max	48.80	36.80	30.39	19.28	42.80	24.57	35.00	25.63	29.68
	Mean	36.94	26.91	20.76	11.26	31.93	16.01	28.85	19.08	23.97

E1: recommended sowing date at Sakha, E2: late sowing date at Sakha, E3: recommended sowing date at El-Kharga, and E4: late sowing date at El-Kharga, L1: Sakha, L2: El-Kharga, D1: recommended sowing date and D2: late sowing date.

DTH is days to heading, PH is plant height, CHLC is chlorophyll content, SL is spike length, NSPP is number of spikes per plant, NGPS is number of grains per spike, TGW is 1000-grain weight and GYPP is grain yield per plant.

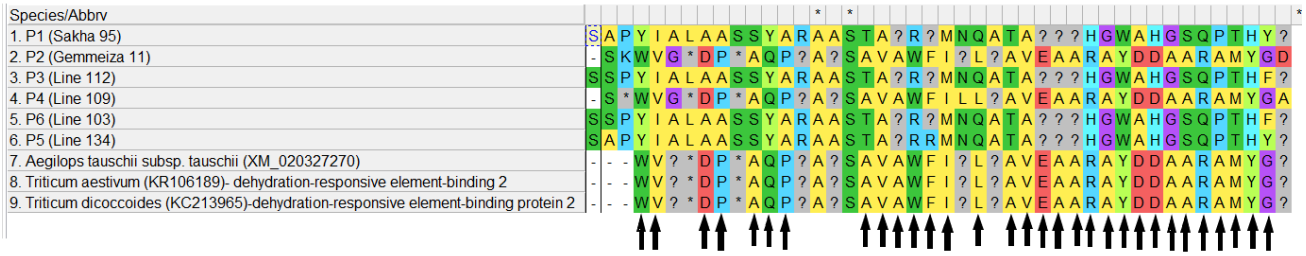

Figure S1. The proposed amino acid sequences inferred from Mega X software. The sequences illustrate that P2 and P4 are similar in amino acid sequences to the heat stress resistance genotypes (*Triticum aestivum, Triticum dicoccoides* and *Aegilops*