

## Supplementary information

**Table S1.** Origin and HMWGs composition for the accessions of *T. monococcum* ssp. *aegilopoides* used in this study.

Country	N	HMWGs variants		Accession
		Ax	Ay	
Iran	10	I	I	PI 401410, PI 401412, PI 427803, PI 427804, PI 427807
		II	II	PI 401411
		VI	VI	PI 401408, PI 401409, PI 427805, PI 427806
Iraq	70	I	I	PI 427405, PI 427637, PI 427638, PI 427665, PI 427666, PI 427667, PI 427668, PI 427669, PI 427675, PI 427676, PI 427677, PI 427678, PI 427689, PI 427690, PI 427691, PI 427692, PI 427694, PI 427710, PI 427711, PI 427712, PI 427713, PI 427714, PI 427723, PI 427727, PI 427735, PI 427742, PI 427743, PI 427744, PI 427745, PI 427746, PI 427747, PI 427748, PI 427769, PI 427770, PI 427771, PI 427772, PI 427773, PI 427785, PI 427786, PI 427838, PI 427839, PI 427850, PI 427851, PI 427852, PI 427919, PI 427920, PI 427921, PI 427930, PI 427932, PI 427937, PI 427939, PI 427943, PI 538542, PI 538543, PI 538544, PI 538564, PI 538565, PI 538568, PI 538569
		II	II	PI 427781, PI 427929, PI 427938
		III	III	PI 427741
		VI	VI	PI 427724, PI 427725, PI 427726, PI 427734, PI 427736, PI 427737, PI 427738
		I	I	PI 427486, PI 427487, PI 427498, PI 427500, PI 427501, PI 427504, PI 427534, PI 427535, PI 427536, PI 427538, PI 427561, PI 427562, PI 427574, PI 427599, PI 427600, PI 427601, PI 427602, PI 427603, PI 427621, PI 427632, PI 427971, PI 538535, PI 538536, PI 538537, PI 538538
		II	II	PI 427471, PI 427472, PI 427480, PI 427481, PI 427482, PI 427483, PI 427499, PI 427505, PI 427506, PI 427537, PI 427541, PI 427542, PI 427543, PI 427559, PI 427560, PI 427563, PI 427628, PI 428003, PI 428004, PI 470712, PI 538525, PI 554521, PI 554522, PI 554534, PI 554535, PI 554536, PI 554537, PI 554548, PI 554554, PI 554555, PI 554557, PI 554558
		II	VII	PI 427497
		III	III	PI 427484, PI 427622, PI 427623, PI 427624, PI 427626, PI 427976, PI 427989, PI 538540, PI 554503, PI 554559
		IV	IV	PI 427448, PI 427453, PI 427470, PI 427488, PI 427489, PI 427490, PI 554504
		V	V	PI 427629, PI 427630, PI 470713, PI 470714, PI 470720, PI 470721, PI 554546, PI 554547
Turquía	90	VI	VI	PI 427454, PI 427473, PI 427474, PI 427575, PI 427576, PI 427963, PI 538534

**Table S2.** Description of PCR primers pairs for amplifying.

Primers designed by D'Ovidio <i>et al.</i> [35]	
Ax	Fw: 5'-AGATGACTAAGCGGTTGGTTC-3' Rv: 5'-AAGCGAGCTGCAGAGAGTTC-3'
Ay	Fw: 5'-ATGGCTAAGCGGTTGGTCCT-3' Rv: 5'-GGCTAGCCGACAATGCGTCG-3'
Primers designed by Guzmán and Alvarez [36]	
Wx1	Fw: 5'-TTGCTGCAGGTAGCCACACC-3'
Wx2	Fw: 5'-ATGGTCATCTCCCCGCGCTA-3' Rv: 5'-GTTGACGGCGAGGAAGTGT-3'
Wx3	Fw: 5'-GGCATCGTCAACGGCATGGA-3' Rv: 5'-TTCTCTCTTCAGGGAGCGGC-3'
Primer designed by Ayala <i>et al.</i> [37]	
Wx1.3	Rv: 5'-TAGCGCGGGGAGATGACCAT-3'
primers designed by Massa <i>et al.</i> [38]	
Pina/Gsp-1	Fw: 5'-GGTGTGGCCTCATCTCATCT-3' Rv: 5'-AAATGGAAGCTACATCACCAGT-3'
primers designed by Lillemo <i>et al.</i> [39]	
Pinb	Fw: 5'-GAGCCTCAACCCATCTATTCATC-3' Rv: 5'-CAAGGGTGATTTTATTCATAG-3'

PCR conditions				
Initial denaturation = 5 min at 95 °C				
Pair		Denaturation	Annealing	Extension
Ax [Fw/Rv]		1 min at 94 °C	2 min at 66 °C	2 min 30 s at 72 °C
Ay [Fw/Rv]		30 s at 94 °C	30 s at 65 °C	2 min at 72 °C
Wx1Fw/Wx1.3Rv		40 s at 94 °C	30 s at 64 °C	1 min at 72 °C
Wx2Fw/Rv	35 cycles	30 s at 94 °C	30 s at 66 °C	1 min 30 s at 72 °C
Wx3Fw/Rv		40 s at 94 °C	30 s at 64 °C	1 min 30 s at 72 °C
Pina/Gsp-1 [Fw/Rv]		40 s at 94 °C	30 s at 64 °C	1 min at 72 °C
Pinb [Fw/Rv]		45 s at 94 °C	1 min 30 s at 60 °C	45 s at 72 °C
Final extension = 10 min at 72 °C				