Supplemental **Table S1.** Main characters and country of origin of the studied tomato lines.

Characters / Genotypes		Country of origin	Heat tolerance	Plant height	Fruit size	Fruit length	Fruit diameter	Productivity
G1	**AVTO1010**	Taiwan	Good	Indeterminate	Large	Intermediate	Wide	High
G2	**AVTO0101**	Taiwan	Good	Indeterminate	Large	Long	Wide	High
G3	**AVTO9001**	Taiwan	Good	Indeterminate	Medium	Intermediate	Intermediate	Intermediate
G4	**AVTO1001**	Taiwan	Fare	Semi-determinat	Medium	Intermediate	Intermediate	Low
G5	**AVTO1016**	Taiwan	Moderate	Indeterminate	Small	Short	Narrow	Low
G6	**AVTO1015**	Taiwan	Good	Semi-determinat	Small	Short	Narrow	Low

Supplemental **Table S2**. Calculations and formulae of karyotype parameters.

Karyotype parameters	formula	Reference
The total haploid length of the chromosome set (THL)	$\mathbf{(THL) = (LA+SA)}$	[1]
Coefficient of Variation of Centromeric Index (CVCI)	$\mathbf{CVCI} = \frac{SCI}{XCI}\mathbf{x100}$	[2]
Coefficient of Variation of Chromosome Length (CVCL)	$\mathbf{CV_{CL}} = \frac{SCL}{XCL}\mathbf{x100}$	[2]
Mean Centromeric Asymmetry (MCA)	$\mathbf{M_{CA}} = \mathbf{A \times 100}$	[3]
The Karyotype asymmetry index (AsK%)	$\mathbf{\%AsK} = \frac{\mathbf{LA}}{\mathbf{(LA+SA)}}\ \mathbf{x\ 100}$	[4]
The total form percent (TF%)	$\mathbf{TF\ \%} = \frac{\sum \mathbf{SA}}{\sum \mathbf{TL}}\ \mathbf{x\ 100}$	[5]
The index of Karyotype symmetry (Syi)	$\mathbf{Syi\ index} = \frac{\mathbf{Mean\ length\ of\ the\ short\ arms}}{\mathbf{Mean\ length\ of\ the\ long\ arms}}\ \boldsymbol{x\ 100}$	[6]
The index of chromosomal size resemblance (Rec)	$\mathbf{Rec\ index} = \frac{\sum_{i=1}^{n} \mathbf{CLi/LC}}{\mathbf{n}}\ \mathbf{x\ 100}$	[6]
The intrachromosomal asymmetry index (A1)	$\mathbf{A_1} = \mathbf{1-}\frac{\sum_{i=1}^{n}\frac{qi}{pi}}{n}$	[7]
The interchromosomal asymmetry index (A2)	$\mathbf{A_2} = \frac{\mathbf{SCL}}{\mathbf{XCL}}$	[7]
The degree of asymmetry of Karyotype (A)	$\mathbf{A} = \frac{\sum_{i=1}^{n}\frac{pi-qi}{pi+qi}}{n}$	[8]
The dispersion index (DI)	$\mathbf{CG} = \frac{\mathbf{Length\ of\ median\ short\ arm}}{\mathbf{Length\ of\ median\ chromosome}}\ \mathbf{x\ 100}$ $\mathbf{CV} = \frac{\mathbf{SCL}}{\mathbf{XCL}}\mathbf{x100\ \&\ CV= A_2 x\ 100}$ $\mathbf{DI} = \frac{\mathbf{CG\ X\ CV}}{\mathbf{100}}$	[9]
The asymmetry index (AI)	$\mathbf{AI} = \frac{CVCL\ X\ CVCI}{100}$	[2]

LA: long arm, SA: short arm, CVCI: coefficient of variation of centromeric index, SCI: standard deviation of centromeric index, XCI: mean of centromeric index CVCL: coefficient of variation of chromosome length, ,SCL: the standard deviation of chromosome lengths, XCL: mean of chromosome length, TL: total chromosome length, CLi: length of each chromosome, LC: longest chromosome, qi: mean length of short arms, pi: mean length of long arms, CG: centromeric gradient, CV: coefficient of variation of chromosome length,.

Supplemental **Table S3**. The primer names and nucleotide sequences, of the studied DNA makers.

No	Name	RAPD Sequence (5→3)

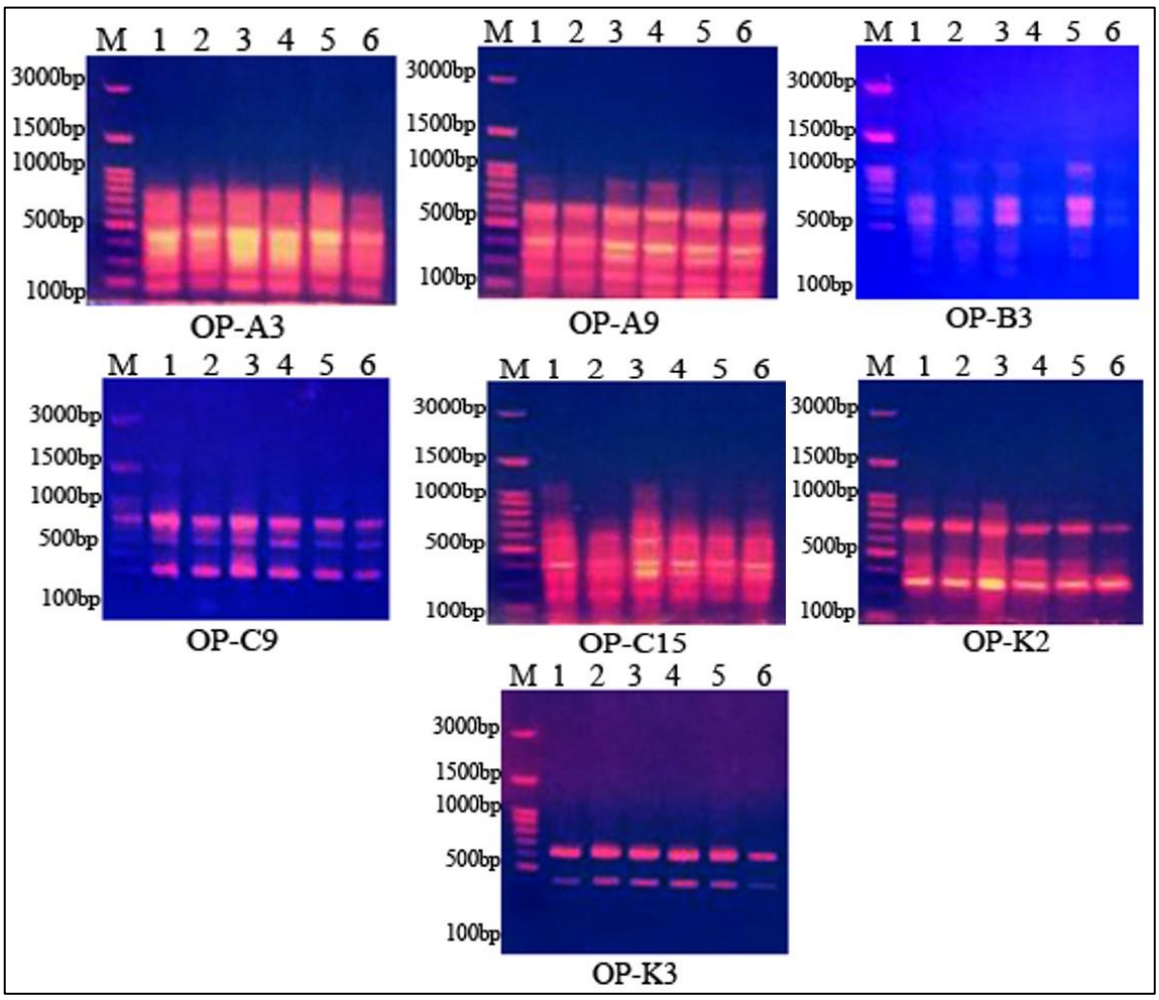
1	**OP-A3**	CAGCACCCAC
2	**OP-A9**	GGGTAACGCC
3	**OP- B3**	CATCCCCCTG
4	**OP-C9**	CTCACCGTCC
5	**OP-C15**	GACGGATCAG
6	**OP-K2**	CACGAGTCTC
7	**OP-K3**	CCCTACCGAC
No	**Name**	**SCoT Sequence (5→3̀)**
1	**SCoT 2**	ACCATGGCTACCACCGGC
2	**SCoT 4**	ACCATGGCTACCACCGCA
3	**SCoT 12**	CAACAATGGCTACCACCG
4	**SCoT 13**	ACCATGGCTACCACGGCA
5	**SCoT 15**	CCATGGCTACCACCGGCT
No	**Name**	**ISSR Sequence (5→3̀)**
1	**49A**	CACACACACACAAG
2	**49B**	CACACACACACAGG
3	**89B**	CACCAC CAC GC
4	**HB-8**	GAGAGAGAGAGAGG
5	**HB-9**	CACACACACACAGT
6	**HB-14**	CTCCTCCTCGC
7	**HB-15**	GTGGTGGTGGC

Supplemental **Table S4.** Similarity coefficient among six lines of tomato using karyotype parameters.

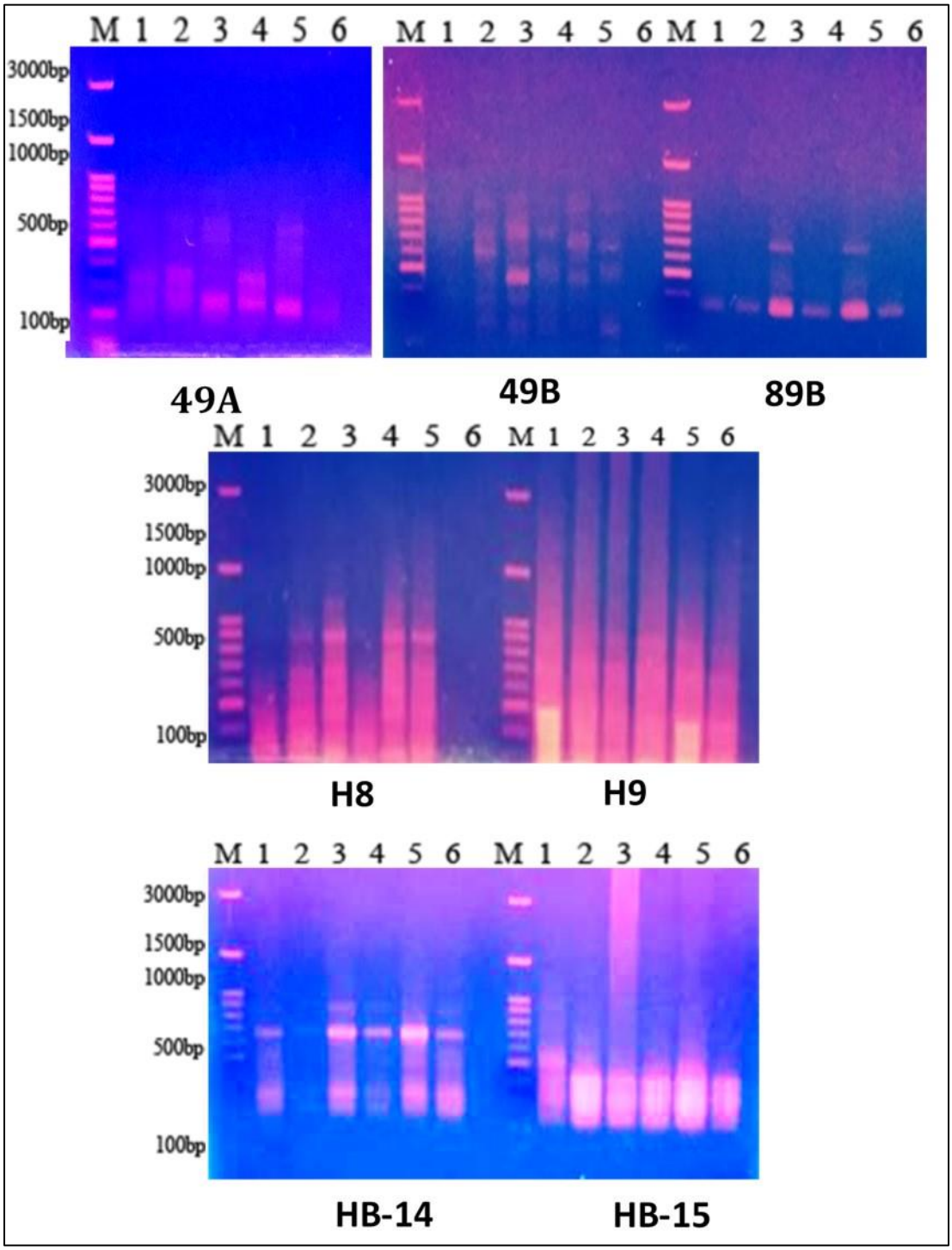
Genotypes	**G1**	**G2**	**G3**	**G4**	**G5**	**G6**
G1	1					
G2	0.989	1				
G3	0.995	0.995	1			
G4	0.985	0.999	0.993	1		
G5	0.999	0.993	0.999	0.99	1	
G6	0.995	0.978	0.989	0.974	0.993	1

Supplemental **Table S5.** Pearson correlation between different karyotype parameters for six lines of tomato.

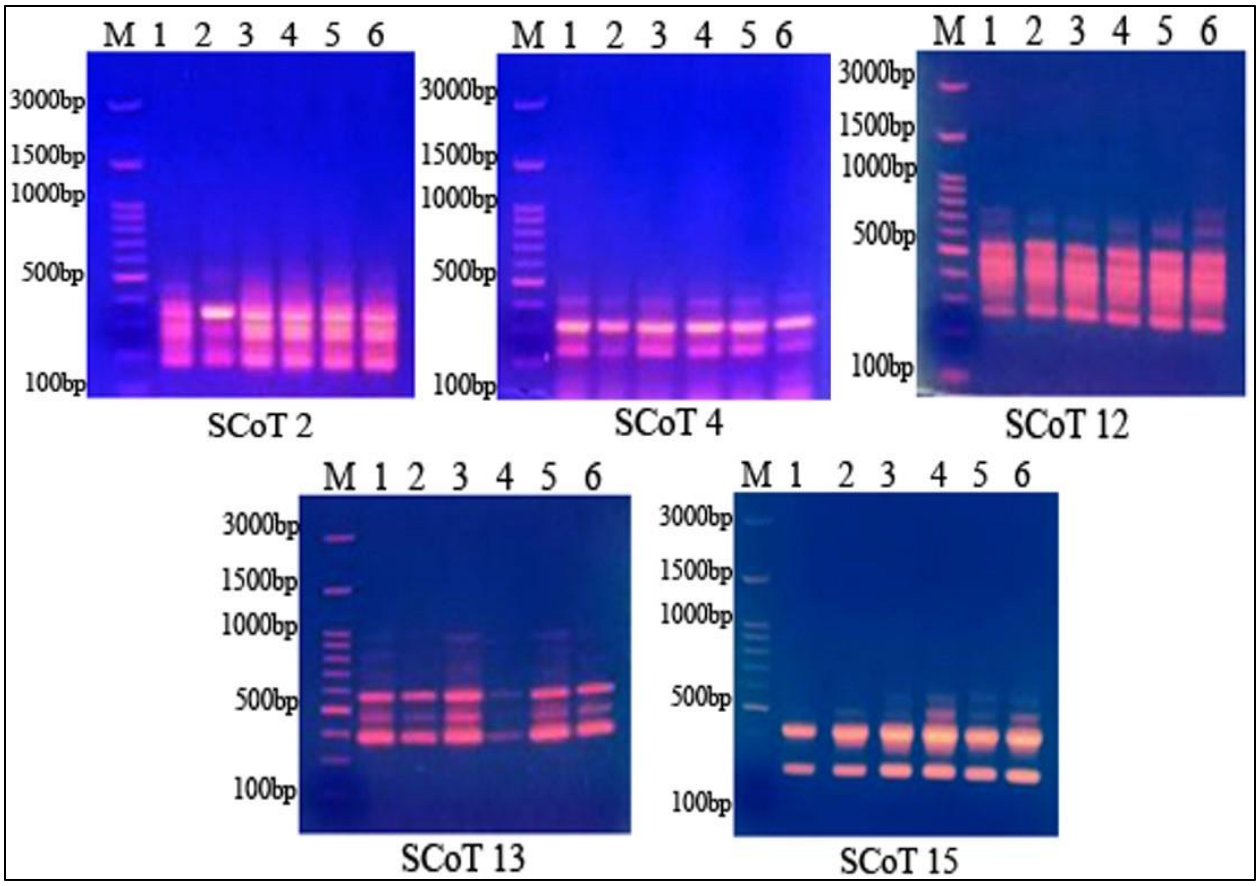
Karyotype parameters	THL	CVCI	CVCL	MCA	ASK%	TF%	Syi index	Rec index	A1	A2	A	DI	AI
THL	1												
CVCI	0.74	1											
CVCL	-0.03	-0.413	1										
MCA	0.287	0.751	-0.351	1									
ASK%	0.289	0.727	-0.367	0.991	1								
TF%	-0.289	-0.727	0.367	-0.991	0.487	1							
Syi index	-0.282	-0.718	0.358	-0.99	0.992	-0.487	1						
Rec index	0.032	0.517	-0.868	0.457	-0.483	-0.992	-0.483	1					
A1	0.207	0.671	-0.325	0.993	0.994	0.483	-0.992	0.43	1				
A2	-0.064	-0.465	0.99	-0.459	-0.496	-0.994	0.475	-0.876	-0.441	1			
A	0.315	0.773	-0.399	0.997	0.563	0.496	-0.992	0.504	0.988	-0.507	1		
DI	-0.062	-0.422	0.972	-0.461	0.487	-0.563	0.489	-0.834	-0.454	0.992	-0.509	1	
AI	0.844	0.882	0.057	0.593	0.992	-0.487	-0.558	0.116	0.514	-0.001	0.597	0.035	1



Supplemental Figure S1. RAPD patterns of the six tomato lines revealed by seven primers.



Supplemental Figure S2. ISSR patterns of the six tomato genotypes revealed by seven primers.



Supplemental Figure S3. SCoT patterns of the six tomato genotypes revealed by five primers

References

1. Peruzzi, L.; Leitch, I.J.; Caparelli, K. Chromosome diversity and evolution in Liliaceae. *Ann. Bot.* **2008**, *103*, 459–475, doi:10.1093/aob/mcn230.
2. Paszko, B. A critical review and a new proposal of karyotype asymmetry indices. *Plant Syst. Evol.* **2006**, *258*, 39–48, doi:10.1007/s00606-005-0389-2.
3. Peruzzi, L.; Eroğlu, H.E. Karyotype asymmetry: Again, how to measure and what to measure? *Comp. Cytogenet.* **2013**, *7*, 1–9, doi:10.3897/compcytogen.v7i1.4431.
4. Arano, H. Cytological Studies in Subfamily Carduoideae (Compositae) of Japan IX. The Karyotype Analysis and Phylogenic Considerations on Pertya and Ainsliaea (2). *J. Plant Res.* **1963**, *76*, 32–39, doi:10.15281/jplantres1887.76.32.
5. Huziwara, Y. Karyotype analysis in some genera of Compositae. viii. further studies on the chromosomes of aster. *Am. J. Bot.* **1962**, *49*, 116–119, doi:10.1002/j.1537-2197.1962.tb14916.x.
6. Greilhuber, J.; Speta, F. C-banded karyotypes in the *Scilla hohenackeri* group, *S. persica*, and *Puschkinia* (Liliaceae). *Plant Syst. Evol.* **1976**, *126*, 149–188, doi:10.1007/bf00981669.
7. Zarco, C.R. A New Method for Estimating Karyotype Asymmetry. *Taxon* **1986**, *35*, 526–530, doi:10.2307/1221906.
8. Watanabe, K.; Yahara, T.; Denda, T.; Kosuge, K. Chromosomal Evolution in the Genus *Brachyscome* (Asteraceae, Astereae): Statistical Tests Regarding Correlation Between Changes in Karyotype and Habit Using Phylogenetic Information. *J. Plant Res.* **1999**, *112*, 145–161, doi:10.1007/pl00013869.
9. Lavania, U.C.; Srivastava, S. A simple parameter of dispersion index that serves as an adjunct to karyotype asymmetry. *J. Biosci.* **1992**, *17*, 179–182, doi:10.1007/bf02703503.