

Supplementary materials

“Tomato mutants reveal root and shoot strigolactones involvement in branching and broomrape resistance.”

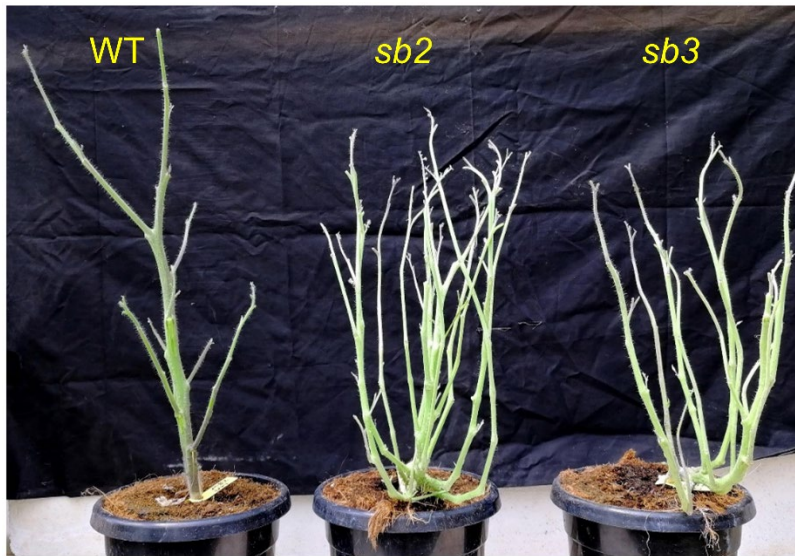
Uri Karniel, Amit Koch, Nurit Bar Nun, Dani Zamir² and Joseph Hirschberg

Table S1. Characterizing morphological traits in grafted plants with reciprocal combinations of the mutants *sb1* and *sb3* and M82 (Scion/rootstock). Data represent an average of 15 independent replications (\pm SE), conducted in the west region of Akko research station, 2018.

Trait	M82/M82	M82/ <i>sb1</i>	<i>sb1</i> /M82	<i>sb1/sb1</i>	M82/ <i>sb3</i>	<i>sb3</i> /M82	<i>sb3/ sb3</i>	<i>Sb1/ sb3</i>	<i>sb3/ sb1</i>
Plant Weight (kg)	0.53 \pm 0.028 ^a	0.43 \pm 0.025 ^a	0.51 \pm 0.02 ^a	0.45 \pm 0.02 ^a	0.42 \pm 0.025 ^a	0.48 \pm 0.025 ^a	0.29 \pm 0.025 ^a	0.43 \pm 0.026	0.41 \pm 0.026 ^a
Stem Length (cm)	38.5 \pm 2.01 ^a	36.6 \pm 1.8 ^{ab}	33.53 \pm 1.93 ^{abcd}	30.15 \pm 1.93 ^{abcd}	35.5 \pm 1.8 ^{abc}	26.4 \pm 1.8 ^d	25.4 \pm 1.8 ^d	28.7 \pm 1.86 ^{bcd}	28.03 \pm 1.86 ^{cd}
Branching/Stem length ratio	1.7 \pm 0.33 ^d	1.78 \pm 0.29 ^d	1.95 \pm 0.31 ^{cd}	3.98 \pm 0.31 ^a	1.91 \pm 0.29 ^d	3.30 \pm 0.29 ^{abc}	3.33 \pm 0.29 ^{ab}	2.46 \pm 0.3 ^{bcd}	3.39 \pm 0.3 ^{ab}
Fruit yield/plant (kg)	10.04 \pm 0.083 ^a	8.54 \pm 0.72 ^a	7.72 \pm 0.72 ^{ab}	4.22 \pm 0.79 ^{cd}	6.94 \pm 0.75 ^{abc}	4.3 \pm 0.83 ^{bcd}	3.66 \pm 0.88 ^{cd}	3.84 \pm 0.79 ^{cd}	3.58 \pm 0.72 ^d

Figure S1: A. The branching pattern of the wild type (WT) M82 line and its isogenic mutants *sb2* and *sb3*. The branching phenotype of *sb1* is identical to *sb2*. **B.** Typical plants of M82 and the mutant *sb1* at harvest stage.

A



B



Figure S2. Infection of the tomato by *P. aegyptiaca*. Plants of *sb3* (left bottom) next to WT grown in a field contaminated with *P. aegyptiaca*, two days before harvested.



Figure S3 A: The genomic sequence of the gene *sCcd7* (Soly01g090660) and mutations in *sb1*. Exons are highlighted in yellow. The two mutations in the mutant *sb1* are indicated. An alternative splicing with a cryptic splice site creates a seven-nucleotide deletion in the mRNA (underlined in position 3269-3275)

ATGGATCTTCAATTTGTATCACTACCACCCAACTCTAAAACAAAAGCCAAAATGCAGGCCAAAGCTTGCCATAATAT
TAACAATATTCCTCCAAAACCTCTTGCCACCGGCTAAACTGCCGTCCACGGTGGCGATGAGCCCGAGCCAATTAACAT
TGCCTAGCCACGTGGCGCGAGCCATAACGATCACCACGTCCCCAACTCATGAAGTTTACACACCAGAAATCGATGAC
ACAGTTACTGCCTATTGGGATTACCAATTCCTTTTCGTGTCCCAACGTTCTGAAGCTACCGAACCCGTTTCACTTCG
GGTTCGTGGAAGGATCCATACCATCCGATTTCCCTTCCGGTACGTATTACCTCACCAGGCGCGGCCTATTTCGCGGATG
ATCATGGTTCCACGGTGCACCTCTAGACGGACACGGCTACTTAAGGACATTTGAAATTGATGGTAGTACGGGTCAG
GTTAAGTTTATGGCTAGGTACATTGAAACGGAGGCTCAGACTGAGGAGCGGGACCCGGTGAGTGGAAGTGGAGGTT
CACTCACCAGGCGCGCTTTTCGGTACTGAAAGGAGGGAAGATGGTTGGTAATACGAAAGTTATGAAGAATTGTGGCGA
ATACTAGTGTGTTACAATTGGGGTGGTAGGTTGTTTTGTTTGTGGGAAGGTGGTGATCCTTATGAAATTGATTCTAAA
ACTTTGAATACACTTGGAATAATTTGAATTAATTAAGAACTCTGATCAAGTATTAGAAGATAAAAAAATTAGTCATAG
TGATTTTTTGGATGTTGCTGCTCAGCTATTGAAGCCTATATTATATGTTACGATACGAAAGGACTTTTTATTGTGCTA
AATAATGAAATTGATCTTTATTTAATGACGAATTAGCTAAATATTTTTTTTATGTCAGGGGTGTTTAAAATGTCTCCA
AAGAGATTGTTATCTCATTACAAGATTGATACTCGTAGAAACAGACTTTTAATCATGTGTCATGCAACGCAGAGGATAT
GTTGCTCCCTAGGAGTAATTTTACATTTTATGTTAAGATTGTTTAAATTTTATGAACTGAAATTCCATTTAATTAAT
TTCTTATGTTTCTTCTTTTAAATGTTTAAAGTATCTATTGCACTAGCATTTCATGTCTGGTGTAGTGTAATTTAGGT
CATTATTTTAAATAAAGAAATCGATTTTATAAAGTTCATATTAAGAAACGATTCATTCCCTTAAATCATCGATGTA
AAATTTTTCTTATCAGTAAATTAAGCAACATCAAAAATGAAAGGAAAAACAAGCTTTTTTCATATTATTTTGGCTTT
TTTTTTTTGCTTGTAAGCCTGACATCAGTAAGGTGGGATTTTATTATATGTTTTCTTTTTTTGAAATAAATAAAT
AAATAAGAGTAGAGGGTCCAGTGATAAATAAATATTTATAATGTTTTTAACTAAAACAAGGAGTAAACATAATTA
AATGATCATTATCCTAGTATATAATACTCCAATAATCCAACCTCTACTTTTTAAAAAATTGTATATTTTCATCAACAT
CACATGTAGATGTAGTACAACGTTAACAAGAATAATTCTTTTGTCTCCATATATTCATAATAATTCAAATT
CTAGTTAATTTAATTCATTTTATTTTTTTTTTGTCTAGAATTTGATTCCAATTTCCAGCTACTACAAAGCCAAGAAT
TCGAGATCCCAGATCATTTAATGATACATGATTGGGCTTTTACTGATACTCACTATATATTGTTTCGGCAACCGCATC
AAACTCGATATCCCCGTAATAATTATTCGATTTCTATACTAAAAATAAATATTTTCATTTTACTTATTTATTCAT
AAAATTTTGCCTACGCCATCGTTGCAGGATCAATGACAGCAGTATGTGGGCTTTCTCCAATGATATCAGCATTATCA
GTAAATCCAAGCAAACCAACATCTCCAATTTATTTGCTGCCTAGATTTTCGTAACAATAATGTAGAAAGAGATTGGAG
AAAACCTATAGAAGCTCCTTCACAAATGTGGGTGTACATGTTGGAAATGCTTTTGAAGAAATTGATGAACAAAATG
GAAATCTAAACATACAAATTCAGGCTTCTGGTTGCTCTTACCAATGGTTCAATTTCCAAAAAATGTTTGGTAAGCAA
GCACGAGTTTATGTCTGCCGCACTGTCAGTATATATAAACTAAAACGTTTTATATAGTAGATGATTAATAACTTAATT
TGTTTCTTTTTCTCCATATATATTTTTTTCAGGCTATGATTGGCAAAGTGGTAAACTTGATCCTTCCATGATGAATGTA
GAAGAAGGAGAAGAAAAGCTATTGCCTCACTTAGTTTCAGGTCTTCTTCTAATGTTTATGTTTATTATAATAAATCG
TAAAATTATTATTTTTTAAACAAAAAATAAATAAATAAAGACGATTGGACTTAATCAATACATATAATCATTTTAT
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GGAATTGCACAAAATGTTTCAGTAAATGATCTAAATCCTGAATGGAACAAAGCAGCAGATTTTCCAGCGATGAATCCA
GAATTTTTCAGGCAGAAAAACAGATATATTTATGCAGCAACATGTACAGGTTACGTCAAGCGCTACCCCATTTTCC
TTTTGACGCAGTCGTGAAATTAAACGCGGTTGATAAATCAGTCCAAAAGTGGTCAGCTGGTAGAAGAAGATTCAATTG
GTGAACCTGTTTTTATTCCAAGAGGAACATAAAGAGGATGATGGATACCTTCTTGTGGTTGAAGTAAGTAATTAT
AACTTACATATACACATACACTAATAAAGTTTGCATAGTTAGTGTCTTTTAGCACCACATGTCTTATTTTTCTACGA
GTAAATATCACTTTTAGTTACTTTGACTTTAAATATGTTATTTTCGAGTGATATATGATTATGTAAGAAAATTTTA
GAAGTTTACAATGTGGTAAATTTTTTATACTCTAGTGTACCTTTATTTGTTATAGCAGACAATTCGTCTTAATTCAA
AGATTGACAAATTAAACGTCGTATTTAAAGACATTAATTGTAATTTATATATAAAAAAATAGTATTACTTCTATT

sb1 C T

CTTATGATTTTTGTGTGTGAATATTTAATTTGCAAGTATGCGAGTGTCAACACAAAGGTGTTATCTTGTAATTTTGGATG
CACAAAAAATTTGGAGAGAAGAATGAAGTAGTTGCAAGACTTGAAGTCCCAAGACATTTGAATTTTCTCTTGGTTTT
CATGGCTTTTGGGCTCCTACCAACTCTAGCCTAGCCAATCTACAAAAAATTGAATCCAAGTGTA AAAACTCTTGGTTC
AATGATGAAGGATAACATGGTTAACTTGGACAATAATAAAAAAATAAATAAATAAATGTTTTTATATATATA
GATGTTTATTAAATAGCTTAATTATGCAAAAGTTTTTTTAGAAAATTTAATAAGGTTAATTTTTTGGTAAATAGTTCA

TTTGTATACTAGAAATCCAGAAGAGTTCCAACAATGTCAATTCTTTTATTTTCAGATGTAAGCATTTTTTTAGTTGTAT
AAGCTATGATCATATAATTAATTTATTTTG

Fig. S3 B. The amino acid sequence of the CCD7 polypeptide in tomato.

Wilde type

MDLQFVSLPPNSKTKAKMQAKACHNINNIPKLLPPAKLPSTVAMSPSQLTLPSHVARAITITTSPTHEV
YTPEIDDTVYAYWDYQFLFVSQRSEATEPVSLRVVEGSIPSDFPSGTYYLTGPGLFADDHGSTVHPLDGH
GYLRTFEIDGSTGQVKFMARYIETEAQTEERDPVSGKWRFTHRGPFVSLKGGKMGNTKVMKNVANTSVL
QWGGRLFCLWEGGDPYEIDSKTLNLTGKFELIKNSDQVLEDKKISHSDFLDVAAQLLKPILYGVFKMSPK
RLLSHYKIDTRNRLLIMSCNAEDMLLPRSNFTFYEFDSNFQLLQSQEFEPDHLMIHDWAFTDTHYILF
GNRIKLDIPGSMTAVCGLSPMISALSVNPSKPTSPIYLLPRFRNNNVERDWRKPIEAPSQMWVLHVGNF
EEIDEQNGNLNIQIQASGCSYQWFNFQKMGYDWQSGKLDPSMMNVEEGEEKLLPHLVQVCINLDKKGNC
TKCSVNDLNPEWNKAADFAMNPEFSGRKNRYIYAATCTGSRQALPHFPFDVAVKLNVDKSVQKWSAGR
RRFIGEPVFIPRGTNKEDDGYLLVVEYAVSTQRCYLVILDAQKIGEKNEVVARLEVPRHLNFPLGFHGF
WAPTNSLANLQKIESKCKNSWSMMKDNMVKLGQ

Mutant sb1

MDLQFVSLPPNSKTKAKMQAKACHNINNIPKLLPPAKLPSTVAMSPSQLTLPSHVARAITITTSPTHEV
YTPEIDDTVYAYWDYQFLFVSQRSEATEPVSLRVVEGSIPSDFPSGTYYLTGPGLFADDHGSTVHPLDGH
GYLRTFEIDGSTGQVKFMARYIETEAQTEERDPVSGKWRFTHRGPFVSLKGGKMGNTKVMKNVANTSVL
QWGGRLFCLWEGGDPYEIDSKTLNLTGKFELIKNSDQVLEDKKISHSDFLDVAAQLLKPILYGVFKMSPK
RLLSHYKIDTRNRLLIMSCNAEDMLLPRSNFTFYEFDSNFQLLQSQEFEPDHLMIHDWAFTDTHYILF
GNRIKLDIPGSMTAVCGLSPMISALSVNPSKPTSPIYLLPRFRNNNVERDWRKPIEAPSQMWVLHVGNF
EEIDEQNGNLNIQIQASGCSYQWFNFQKMGYDWQSGKLDPSMMNVEEGEEKLLPHLVQVCINLDKKGNC
TKCSVNDLNPEWNKAADFAMNPEFSGRKNRYIYAATCTGSRQALPHFPFDVAVKLNVDKSVQKWSAGR
RRFIGEPVFIPRGTNKEDDGYLLVVE**CQHKGVIL***

Figure S4 A: The genomic sequence of the gene *S/Ccd8* (Solyc08g066650). Exons are highlighted in yellow. The G to A mutation at position 2,659 in *s/Ccd8* from the mutant *sb2* is indicated.

TCACCATACTCTCAAATTCTCTCAAATAATATTCTTCACATCTATGGCTTCTCTTGCTTCTTCAACAACCAAAATTT
ATTGTAACAAGATCCTTCCTGACATGTTTGATCATGGCAAACATGAATCTCATCTTGGATCAAAGTTGAAAAACAAC
GAAAAAACAAGAAAAAATTGGACTTGAAATTGGTTACAAAGGTTGCTAGCCAATTGCCTGTAATAGTTCCACCACC
AGATCAAGAGGTGATTAGTAAGGAGAAAAAGCTTGCTGCATGGACTAGCGTACGCCAAGAAAGATGGGAAGGAGAAC
TCGTCGTTGAAGGCGAGTTACCATTGTGGCTGGTATGTTATTGTTTGTGTATATAAGTTAAATATGAACGTTTCGTG
TTACATCCATTTTTTTGTTTTAATGTGAAGTTTTCTTTTTTGGAACTACTTATATATTATGATTTTTCTTCACCAA
AAAGTATTGAGATCAAAGATGCATGTGTACCTAATACATGTTTTCTCTCAAGAAAATATGAAGTATACATATTGAA
AACAAAGGTTTATGAACCTAATTATTCTGCTATTTAGTACACTACTATAGACCCAAAGATTTTCCTCACTTGATAAT
CAGTCGGAAATTTTGTATTATAAAATATGATTTTCTGAGTCATTTTCGGCCGAGTTAGCTTACTGAAAAAATGTGT
GACGGAAAAGAGATTCTCACTAAAATATATAGTAGAAAAGTTCTAATATTTCTCCATGAAAACATTACTACTTTTTCT
TTTCTTATCAATTCAATTAGAAAAATCGACGAAAATAGTCGCTAAACATTTTCAAATAAGAAAAATATGATTTCTTT
AATAGTGGGTATAAACACTCGTCAAGAAGCTAATTAATAAGAAGCAATTATATTCTTAGCAATAATCTTGTGATGAT
CTCACATTCAACAAGGATATTCTCTTTCTTTCAAGATGATAAATAATGTATAGTATTAAACGACAAGAAGCTATTTA
AGATCTGATTGAAGATTAAAAATAAAACAATCTTTTTCTTTCGTATATAAAATATTTCTTTTGGAAAAATAAA
ATATTCCTTTTATCTTTTGTCTGAATAAAATTTAATAGGACGTAGTACATCAGCTTAACCTCATTCCACATCATGTCAC
ATTCAATCCAAGTCCAAATTTGAGCACATAAAATTATTTTATTTTATTTCATTATTTTCTTTGTCTATGTAGAATGGCACGT
ACCTAAGAAATGGTCCAGGACAATGGCACATAGGTGACTACAATTTTCGTACCTTTTCGATGGCTACGCTACCTTA
GTCCGTCTTCATTTGAAAATGGACGATTAATCATGGGTTCATAGACAAATCGAATCGGACGCATATAAAGCAGCAAA
AATCAGTAAGAAAATATGTTACAGAGAATTTTCAGAAGTACCTAAAGTAGACAATTTCTTATCTACATAGGTGACA
TGGCAAAATTACTCTCCGGTGCATCCCTAACCGATAATGCTAACACTGGAGTCGTTAAACTTGGGGATGGACGCGTA
GTCTGCTTAACTGAGACGATAAAAGGTTCCATTGTAATTGATCCGAACACCCTAGATACAATTGGGAAATTTGAATA
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ATTTAATGAACCCGGGATATACGGTGGTGAGAATGGAGGCAGGGACAAATGAGAGGAAGTATATAGGGAGAGTGAGT
TGTAAGAGGAGGACCAGCACCAGGATGGGTTCATTCTTTCTGTTACAGAAAATTATGTTATTGTGCCTGAGATGTC
ACTAAGGTATTGTGCAAAAAATTTGTTGAAGGCTGAGCCAACACCCTGTATAAGTTTGTAGTGGCATCCTGATTCTA
AAGCATTGTGACATGTTATGTGTAAAGCCAGTGGCAACATTGTAAGTCATTCTTTCTCATCACTTAATTCTTTTAT
GATGTAAGAGTAATCTAATGGTGAGAGACTATCTATTCAAAAGGTGGCAAGTGTAGAAGTGCCATTATACGTGACAT
TCCACTTCATCAATGGATACGAAGAAAAAGACGAAGATGGAAGAGTTACCGCTGTGATTGCAGATTGCTGTGAGCAT
AGCGCAGACACCACCATCCTTGACAAGCTCCGCCTTGAGAATCTTCGTTTCCTTCAACGGCAAGGATGTCTTACCTGA
TGCAAGGTACAATTGAAGGAAATGAGTATTACATCACTTCAAAAGTACATTATTAATGGTGTGGTGATATATAGG
GTTGGAAGATTGAGAATACCATTAGATGGAAGTCCATATGGAGAATTAGAAGCAGCATTGGATCCAAATGAACATGG
AAAAGGCATGGATATGTGCAGTATGAATCCTGCTTATTTAGGCAAGAAATACAGATATGCTTATGCTTGTGGTGCTA
AGAGGCCTTGTAATTTCCCAACACCCTCACCAAGGTGAGCTTCTTTTCTTACAATGGTTATTGTTTCATCATCAA
GTAATAACTGACAATATTTTGCAGATTGATTTATTTGATAAGAAGGCAAGAATTGGTATGATGAAGGTGCTGTGCC
sb2 **A**
TTCTGAACCATTCTTTGTGGCTCGACCCGGTGCAACAGAGGAAGATGATGGTAATTAGTTTACCAAAGGTCATTG
CCCTGTTCTGAACAAGGTGTAACATTTTGAACATATATATGCAGGTGTTGTAATCTCAATGATCAGTGACAAGAATG
GAGAAGGATATGCTCTAATACTGGATGGATCAACATTTGAAGAAATTGCAAGAGCTAAATTTCTTATGGTCTCCCC
TATGGGCTACATGGTTGTTGGGTTCCAAAGATATAGTATCACCCACATCCAAGACAATGTTATATCATATTAGCCT
AATACAATCTACAAGTTATAATAAGATGATATTACTAAATTTTCAGTTTTTGAATAGCTATTAGTGACTATTTT
GTGTATATTTGCTCTCAGTAATAGAATGTGTTAAACCATATTAATAGTATGAATGCATATACTCTAAAATGA

Figure S4 B: The amino acid sequence of CCD8 and the glutamate to lysine mutation in *sb2*

MASLASSTTKIYCNKILPDMFDHGKHESHLGSKLKNNEKNKKKLDLKLVTKVASQLPVIV	60
PPPDQEVISKEKKLAAWTSVRQERWEGELVVEGELPLWLNNGTYLRNGPGQWHIGDYNFRH	120
LFDGYATLVRLHFENGRLIMGHRQIESDAYKAAKISKKICYREFSEVPKVDNFLSYIGDM	180
AKLLSGASLTDNANTGVVKLGDRVVCLTETIKGSIVIDPNTLDTIGKFEYSDSLGGLIH	240
SAHPVVTDSFITLIPDLMPGYTVVRMEAGTNERKYIGRVSCRGGPAPGWVHSFPVTEN	300
YVIVPEMSLRYCAKNLLKAEPTPLYKFEWHPDSKAFVHVMCKASGNIVASVEVPLYVTFH	360
FINGYEEKDEDGRVTAVIADCCEHSADTTILDKLRLENLRSFNGKDVLPDARVGRFRIPL	420
DGSPYGELEAALDPNEHGKGMDMCSMNPAYLGKKYRYAYACGAKRPCNFPNTLTIDLFD	480
<i>sb2</i> K	
KKAKNWDYDEGAVPSEPFFVARPGATE E DDGVVISMISDKNGEGYALILDGSTFEEIARAK	540
FPYGLPYGLHGCWVPKI	557

Figure S5 A: The genomic sequence of the gene *sIDwarf14* (*sID14*) (Soly04g077860). Exons are highlighted in yellow. The G to A mutation at position 2,582 in *sID14* from the mutant *sb3* is indicated. The 17 nucleotides sequence deletion in the mRNA, resulting from an alternative splicing is underlined.

TACTAATAAAAAATGATTAATGATGGTGACTGGTGAATAATAATTTTGATAAAAATAACTGAAAATTATTTATACAA
 AGTATTAACCTCTTAATTAATGCTATTAATAAATTTTATTGAAGATATAAATGATTTGGATATATTTAAATTTAATAAAA
 TTTTAATCTACTTAAACAATTTTATCTTAACAGTCTAATATTATACCATTCAAATTTAGAACTCCTTAAAAAATGG
 GGGCTTATACTCCATTACAATCAAACATAAGTGGCCATGGTTATATTTAACGGAAAAATACAATTTGTATAGATTTT
 TTTTTAAAAAACATACAAATTGGAGAAAGAATGAATAGTCAATGGTGTTTTTTTTTCCGATTTAAACGTTTTACGT
 GTTTTTTACAAGTAAAGTATAATTACTATCATATAATATTACGTACGTACAAAACTAATAGTACCAAATTGATTAT
 TTCTTGTGTGATAATTAAAGAACCAAAACCCCTTCAATTAAAAAACACACTCACTTTTCTTTTAGTTAATCTTAAAA
 TACATTTCTATATTTCAAATAATTTAGCTTTGAAATGTCTATTTTTTTTTCTTAGTGAGATGATGATATCGTCATAT
 TTTAGACCATAAATTTTACTCCCTGCGTTTTCTTTTAGTTGTAATAGTTTTCATTTTTTTAGATTCCAACAATATAAAT
 TTTGACTAACATTTTAAAAATATATACTTTTCAATTAATTTGATATGAAAAAACAATTTATAGTAATTTCTGTATAATT
 TTTCAATATCTAAAATTTTATTTTAAAAATATAATTGAAAGATTTGAAAACAATCAAATTAACCTCTAAAAAATATAA
 TATAACAATTAAGGAACAAAAATAATAAAAAAGGTCTTTTCTAAATTTCTATATATAAAAAAATAGCTTATATAA
 ATTAAGACGGATGAAAAGCAAGTAGGTGTCTTTTGGCACTTTTATAAGTACCACACCCCTCCAATCACTTTTTTCCCA
 TTTACACAACCATTAATAAAAAAAAAAATTCAAAAAAAAAAGAAAAAGGATTTAAGTATTCTTCATTTTTTTTTTCGTCC
 AATAAAAAAAGGAACCAAAAACTGAAAATGGGTGACACCTTTTAGATGCTCTTAACGTTTCGGGTGTCGGTTCGG
 GCGAAAGAGTTTTGGTTTTAGCCCATGGGGTCGGTACCGACCAATCCGCTTGGAATCGAATTTTACCTTTTTTTCTC
 CGAGATTACCGTGTTGTTCTGTACGACCTTGTCTGCGCCGGCAGTGTAATCCTGATTTCTTCGATTTCCGACGTTA
 TACGACACTTGACCCCTTACGTTGATGATCTTCTACATATTCTCGATGCTCTTGCAATCGATCGTTGTTCCCTATGTCG
 GACACTCTGTCTCCGCCATGATCGGAATTCTCGCTTCGATTGCGCCGCCCTGAACTCTTCTCTAAACTCATCTCATC
 GGAGCTTCGCCCAGGTGAATTTTCTTTTTTTAAATTTTAACTTTTTTTTTTACTTATTCCATCTCTTTTGTAAATAAC
 TCACAAATCATAGGAGAAATATATAAATCTCCTAGGTAAGGTGTTATTTATCCACTTTTAGTTTATTCGAGTTAATT
 TAAATCAATATTAATAATATAAATATTTAAAAATGTATACTATTAATTAATTTTATGAAATTTAATTTTAAATTAAT
 AAAAAATAACACATAAATTAATAAGTAAAGAATCATACTATTATTTACCAATTTGTAGAAAATGGGGAATGTGGA
 TTATTTTTTAAAAAATTACATCCAATATTTGAGTCAAATTAATAAGTACATCACACATGTATTCAAATAACAAATG
 AAATAAGTAAATGTATTGTGGTAAATTTCTTTAACTTTGACATTTAAATACAGCACATTTATGTACTTTAATTTTGG
 AGAGTTAAATATCATTTTGAGTTTGTTTTTTTTTTAAAAAATTTGATTTAATAAAAAAATTTGTTATATGACATATA
 TAGTGTATAATATCTTTCTGAACATGAATATATTGGAACCAAACTCTGTACCCATAAAATAAGTAAATTTTGT
 TTATGTCGTACTATTTTTTAAATATCGTTTGCATATATTACGAATTATGGTATTATTATTTTTTGCATATATAGTATT
 TTTTGAGTAAATTTATGAAATCGACTCTGTATTGACAAAGTAACAATAGAATCTATTTATATTGTACTTTTTCGTTG
 ACTTCAATTGCATTAGTAATGTTGTTTCATATGTACGTATAATATTTGAGTTTCTATACATACAATATAATATTGAGT
 TTGGTTGGTCTACTCAAAAATAGGAATATTTAACGTGGTCCTTTTGTATTATTTTATTTTCTTTTACTTTTTCTCAAT
 TCCCCATAAAGTTGAGAGCACTTTTGTCAAACCTTACTTATCTTATCCTTAGTTTATGTTTGACAAAATTCATGAATT
 TATTTGCTTAGGAATGTTATGATCAATCAATTGACATTTTATGTTATCAGAATCCTTATCTTAAATCTTTTTAACT
 CCACCAATCTTTAATTAATAATGTTGTACACCAATTC

Sb3 A

AGATTCTTGAATGATGAAGACTACCATGGTGGATTTGAACTCGGAGAAATAGAGAAAGTGTTTTCAGCAATGGAGGC
 AAATTATGAAGCATGGGTCAATGGTTTTGCCCCGTTAGCCGTGCGAGCCGACGTTCCGGCGGGCTGTACGAGAATTCA
 GTAGAACATTGTTCAATATGAGACCAGACATAACATTGTTTGTGTCAAGGACAGTATTTAATAGTGACATGAGGGGT
 GTTCTAGGTCTTGTGAAAGTACCATGTCAATTTTTTTCAGACAGCAAGGGACCACTCTGTACCCGCTTCAGTCGCGAC
 GTATCTAAGAACAACCTTGGTGGGTGGAACACCGTGCATTGGTTGAATATTGAGGGACATTTGCCACATCTTAGCG
 CCCCGAATTTATTGGCTCAAGAACTAAGGAGGGCTCTTACTCATAGGTGATCGATCCTGTTGAAGCGGGTACAGAAT
 GGTGTAATTCATAAACTTAAATCCTGAATTATCATTGTTTTGCGTCAACCAAAACCAAAACAAAGAGACAAAAGG
 ACTATGGATGGTTTGTGTTAATTTTTGAACCTTTGATACACTTTGTGGATTTGTGGAAAAAGTTTGGATTTTTACCCA
 ATAGGATTTTGACAACATTCAAGAATAACAATCCTTGCAAAAAAGAACTTGAATACACAAATTTTGAGTTTATTAT
 TTTTGTGATGAAAAGAGGTTTTTGTTCATTTTCTTTTCCAATTTACTATGTGAGAATAAAGCAAAGAATATGATT
 TTTATTCTTTTCATAATTGACATTCGATCATATTATAATGTGTTTACTTCACAAATAAATGACCCAAATTTTGTGA
 ATTTAAGAGTGAAAATTTTGGTTCTAATAATTTATTATGATACGAAAAATATCCTATATAATTAATATCAATCGAAT
 GAGATCGAGAATAAATTTTTGAAGGAGATGGTGAGATCAGGCAAAATTTCAAGGATGGGTCCATTATGATTATCCAT
 AAAAAAGAGGATAAGATGCACATGATAAATTTACGTGAGAAAGTGTCCCTTCTTTGGACCATTTCCACTTTCTCTC
 TTTATTTTTTAGGGTTGTATTATTCAAATTCACCTTTTGTTTTTTTTTTAAATTTTATTTGGTATTTATGTATGTAAAG
 AAGAATTTGCATCTTAAAAAGAAAACATAAAGTCAAGTGGTACAAAAATAGGAATTTTTTAACCAACTAAGTCATTA

TATAAAACAATTTACTAAAGTAATATATTTTTCTAAAATTTTACAAAAC TAGTATAAACGTATTTTCATGGTAACGTT
TTAGGGTATATTTTATTTTAAAAAACTAACAGCATTAGGTTGATATACGTTACTAAAAGTAAC

Figure S5 B: The amino acid sequence DWARF14 in wild type and *sb3*

Wild type

MGQTLLDALNVRVVGSGERVLVLAHGVGTDQSAWNRILPFFLRD YRVVLYDLVCAGSVNPDDFFRRYTTLDPYVDD
LLHILDALAI DRCSYVGHSVSAMIGILASIRPELFSKLILIGASPRFLNDEDYHGGFELGEIEKVFSAMEANYEAW
VNGFAPLAVGADVPAAVREFSRTL FNMRPDITLFVSRTVFNSDMRGVLGLVKVPCHIFQTARDHSVPASVATY LKNN
LGGWNTVHWNIEGHLPHLSAPNLLAQELRRALTHR*

Mutant *sb3*

MGQTLLDALNVRVVGSGERVLVLAHGVGTDQSAWNRILPFFLRD YRVVLYDLVCAGSVNPDDFFRRYTTLDPYVDD
LLHILDALAI DRCSYVGHSVSAMIGILASIRPELFSKLILIGASPRLPWWI*

Figure S6: Growth habit of WT (M82), *sb1* and *sb3* mutants in different grafting combinations (scion/rootstock).

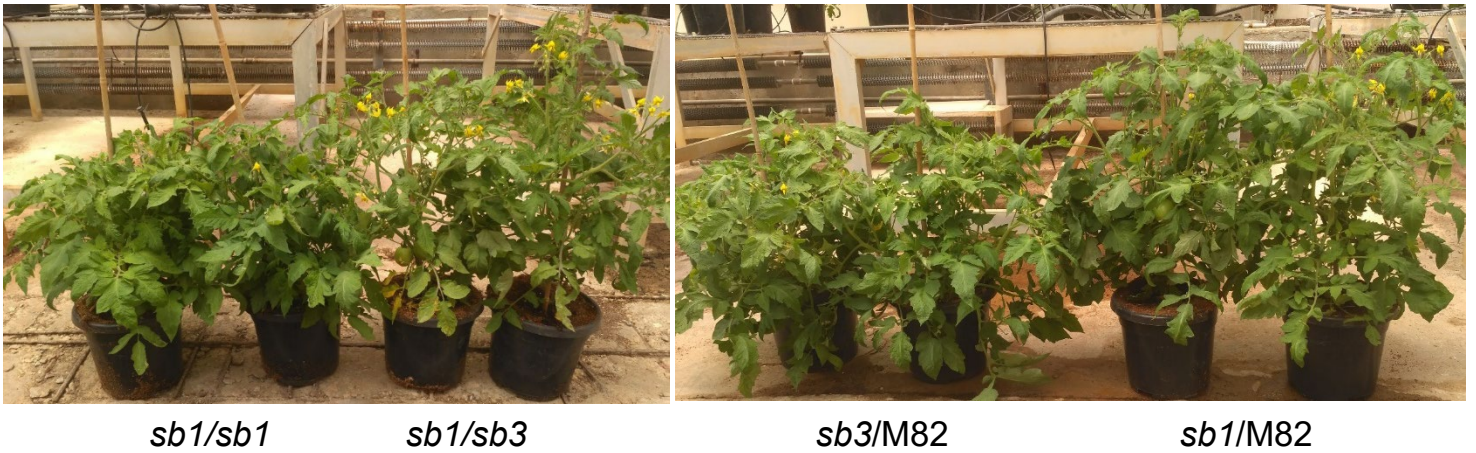


Figure S7: Calibration of SLs measurement based on *P. aegyptiaca* seed germination induced by root extracts from M82 (wild type) in differential dilutions. The dilutions were applied with water, and the control represents water without the root extract. Germination was recorded after 7 and 14 days.

