Supporting Information

Zakhrabekova et al. 10.1073/pnas.1113009109

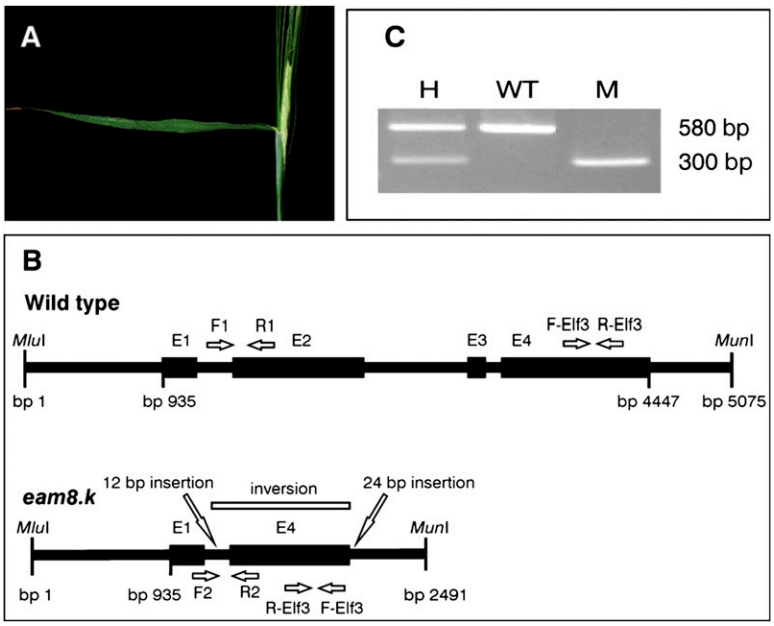

Fig. S1. Mapping populations were phenotyped for the day of heading (*A*) and genotyped, exploring the unique mutation of BW289 (*eam8.k*) (*B* and *C*). (*A*) Barley spike at the day of heading. Fifty percent of the spike should have emerged above the flag leaf. The day of heading was used in phenotyping to approximate the day of flowering. (*B*) Positioning of primers complementary to the barley *Mat-a*/*Eam8*/*Elf3* gene of wild type (*Upper*) and BW289 (*eam8.k*) (*Lower*). The primers were used for screening of the mapping population. Primers F1 (GTCTGATTGGATTGGAAAACCTAG) and R1 (TGGGAAATTTTGCAGTTGG) allowed specific amplification of the wild-type allele, because F1 and R1 recognize a region that is deleted in *eam8.k*. Similarly, primers F2 (ACAAGCTG-CATGGCGATAC) and R2 (TTTCGGTCGATCCAGATG) exploit an inversion in *eam8.k*, which make them specific to this allele. The binding site of primers F-Elf3 and R-Elf3 used for expression analysis of *Elf3* are indicated. (*C*) DNA fragments separated by agarose gel electrophoresis, illustrating the principle of genotyping. Primer pairs specific for the *eam8.k* mutation (M) or the wild-type (WT) allele amplified a 300- or 580-bp DNA fragment, respectively. Both fragments were obtained simultaneously in heterozygous plants (H).

Fig. S2. (Continued)

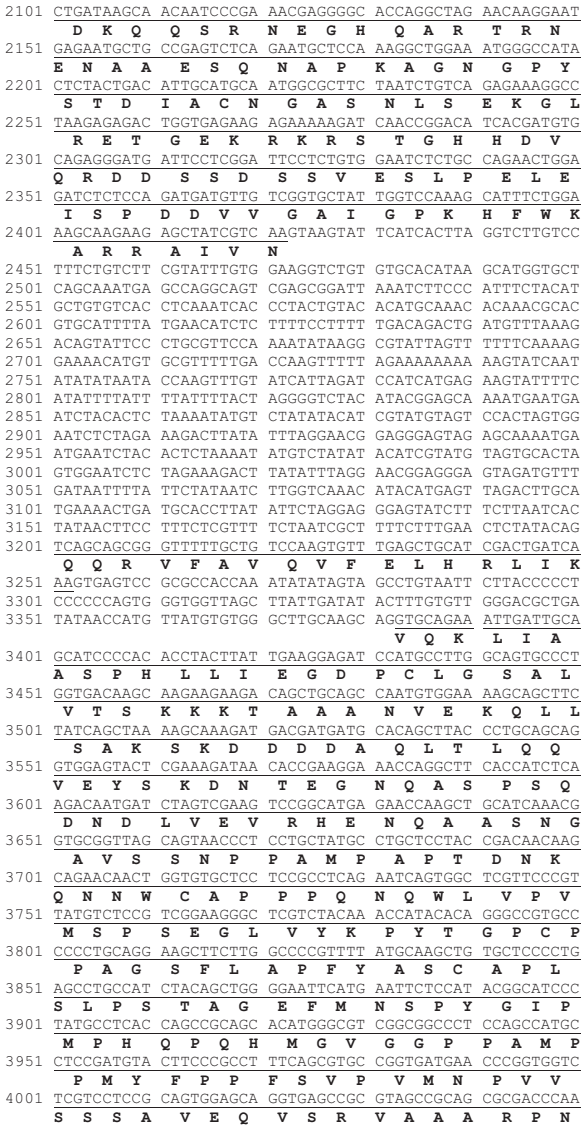

Fig. S2. (Continued)

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4051 CACTCACGAG CACCACTCGA GGAGCTCGTG CAACATGAGG AACGAGGCCG
      T  H  E    H  H  S  R    S  S  C    N  M  R    N  E  A  V
4101 TGTCGGTCGG CGGCGTCTGG AGGTTCCACT CGTCCCGCGG CAGCGAGCTG
      S  V  G    G  V  W    R  F  H  S    S  R  G    S  E  L
4151 CAAGGGAGCA GCGCCGCCAG CGGCCCTTTT GACAGGCAGC AGGGCCAGGG
     Q  G  S  S    A  A  S    G  P  F    D  R  Q  Q    G  Q  G
4201 CGAGGCGAGG GGCCATGCAG CGGCCGCGCC TGCGGCGCCC CTGCCTACGT
      E  A  R    G  H  A  A    A  A  P    A  A  P    L  P  T  S
4251 CGTCGTCGGC CGGGAACGGG AACGGGAACG CGGCCCAGCA GCCCCAGGTC
      S  S  A    G  N  G    N  G  N  A    A  Q  Q    P  Q  V
4301 TCCTCGGGCA GTCAGGAGAA CCCGGTGGCG GCGGCAGCGG CGGCCCGTGT
     S  S  G  S    Q  E  N    P  V  A    A  A  A  A    A  R  V
4351 GATCCGGGTG GTACCGCACA CGGCACGCAC CGCGTCGGAG TCGGCGGCGC
      I  R  V    V  P  H  T    A  R  T    A  S  E    S  A  A  R
4401 GCATCTTTCG GTCGATCCAG ATGGAGAGGC AGCAGAACGG CCCGTGACCG
      I  F  R    S  I  Q    M  E  R  Q    Q  N  G    P  -
4451 AGCGACCATC GGCATGCGGT GGTTGGCCGG CAGAAAGAAA GAAAGGAAGC
4501 TTAGCCAATT AGCGCTTCAG AGTATGCTGT TATTTTTGAG CAGGCAGGCA
4551 GCAAGCAATA GCATTCCTAT ATATAATTTG TCTCTTGGCG TCGGTAAAAG
4601 TGGATTTTTG GCGACTGTAA ATATGCAAAG CAAAGCAGGA CTTGTATGAA
4651 TGCCAGAATG CTGGTTGGGC AAAGCAAAGC AGGACTTGTA TCTATCTATC
4701 TTATTTATCT ATGCCAGAAT GAGAATTGTA ACTGTTACTG TTAGGTGTAT
4751 GTCTCGGGCA AAAAGAAGTG AAACCTGGGA TTGATAGCTC TAATGTATTA
4801 CTTATTATCT ATGTGCAGCC ATGTTTCCTG CTGATATATA AATGGCATGT
4851 TATCTTTTTT TGCCCATTGT GTACTGTATC ATTTATTTTT GTACCTGAAC
4901 CTGCTAGATG ATTATTGAGC AGGCAGGAAG TGAGTCACAG TTTTAGATTT
4951 GTGTTTGAAC TTGGATTTTC AAATGCTGAA AGTAGCATAT TGTATTCGAG
5001 AATTTCTTAC AACTTCCAAA CGTAGTTACC ACATTTTGAC TTGTATGAGA
5051 AGTCAGATGT TGACTACACC AATTG
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Fig. S2. A 5,075-bp MluI–MunI DNA fragment, containing the barley *Elf3* gene that was shown to be identical to the barley *Mat-a* gene. The sequence is that of the barley cultivar Bonus.

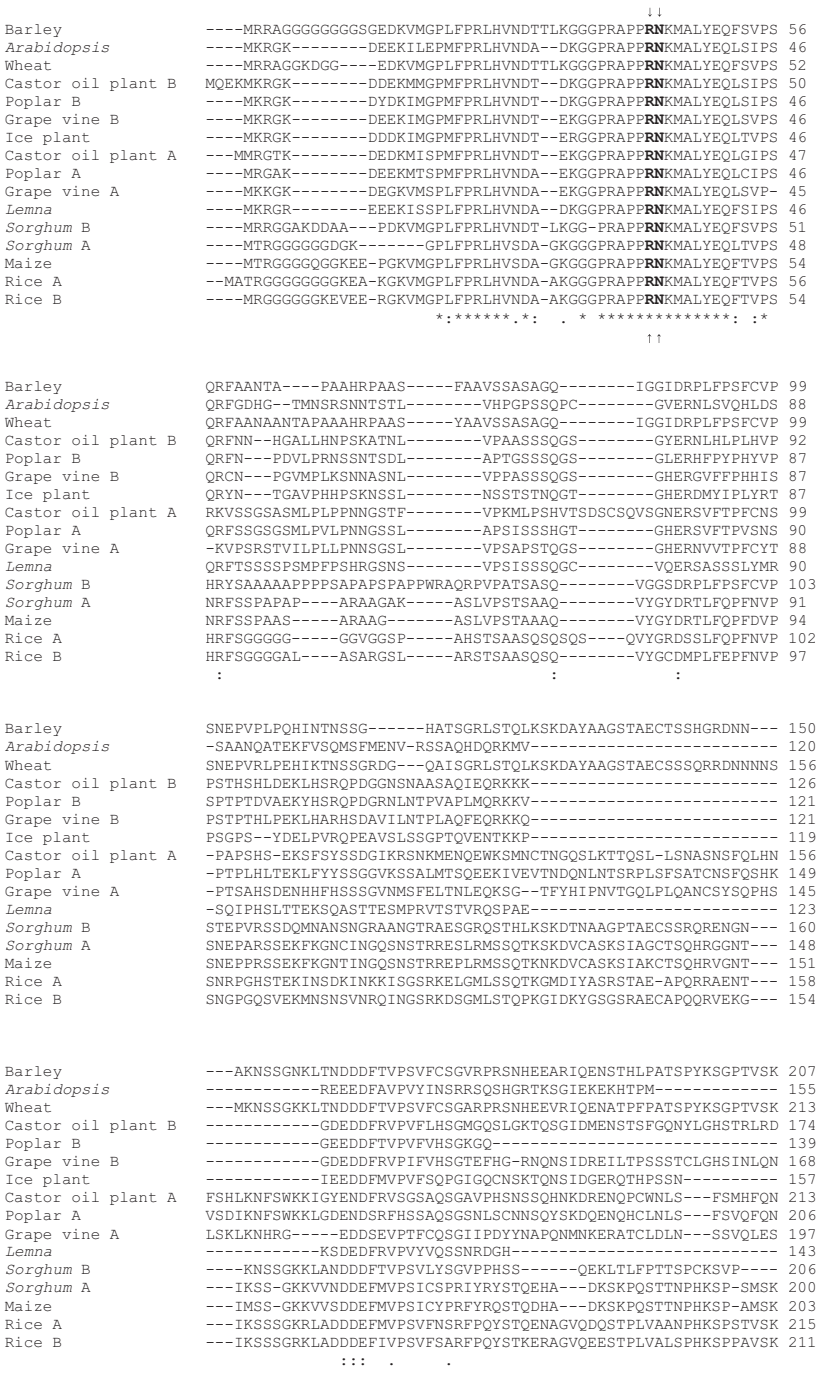

Fig. S3. (Continued)

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Barley              PTAKFPNTDKRYLEGRNPSDTRSRDSPNIIRDKAPANTTTNFLEAEERTSSF-------- 259
Arabidopsis         -------VAPSSHHSIRFQEVNQTGSKQNVCLATCSKPEVRDQVKANARSGGFV------ 202
Wheat               PTAKFPNTDKRYLEGRNASDTRSRDSPSIIRDKAPANTTTNFLETEERTSSF-------- 265
Castor oil plant B  AGDKDQKNNISRGPNLRQDARNQSKENLEACVSSRGHSVRSFTSSPSKELM--------- 225
Poplar B            ------------GLNLRPDTSNQSEDNLEVCVSSSDHIARHSTNLRTREKN--------- 178
Grape vine B        ACEKELKQTSSNGLSVRQDKRSQGDVNRKDYVSSREYSEKSASNLSTKEKID-------- 220
Ice plant           ------HPVPFLCSSEKQANKMSGDITSRRVVINRDQRNLRAYNASTRSSDI-------- 203
Castor oil plant A  VSEKQKKGPGIIDLKATESTRNQTEEQRKMSEACKDLRERYSPVPSFHDKTSADPSCSPS 273
Poplar A            TSETQKKKTGTINVKEIDHMRIQIEDNGKVFEACQNSMEKFATVTSIKDKPSVS---SSS 263
Grape vine A        ACGKHQRN------LNVSHSRESIS--ATASSGLLTRDEIFEPS---------------- 233
Lemna               -------VADCKTRSFKKSDRIHEDLSSTVTLQDASSG--QDHDDDNLRSSG-------- 186
Sorghum B           --AKYSSNGKRHLEGIDVSDVKSKGR-SGIKDTEPVQVRID-LEDEETTPSF-------- 254
Sorghum A           SSAKCYSTVNKHLDRMNEADMRLMNS-PKVKEKEAVQVPKG-VEVKEKDS---------- 248
Maize               SSVECYSTVNKHLDKINEADRRLMNS-PKVKEKEAVQGSKA-VEVKEKSS---------- 251
Rice A              SSTKCYNTVSKKLERIHVSDVKSRTP-LKDKEMEAAQTSKN-VEVEKSSS---------- 263
Rice B              SPTKCYNTVSKNLERINVSDVKSRGS-QKDKETGPAQTLKN-VEVEHFSS---------- 259


Barley              -----------QFSADKTMGKRDDKGSSYR--DKPSSINVSDKQQSRNEGHQARTRNENA 306
Arabidopsis         --------ISLDVSVTEEIDLEKSASSHDRVNDYNASLRQE---------SRNRLYRDGG 245
Wheat               -----------QFSAEKTMGKRDDKGSSYSRVKETSSINVSDKQHSRNEGHQARTRNENA 314
Castor oil plant B  ------IVRPE-DASPSQQNLDDPVASSSSLCENDVCLQQE--ASAALLQQNDSGHDEGV 276
Poplar B            ------DIPEEGNASQNQQYRNNLVSNFTRLHENDTCLQQE--TSAR-LQSNHSEHGDHV 229
Grape vine B        ------ESMKQVNKPSSEDFRDQSSANFSSLHDTDGCLLQG--NRAG-AQLGEPDHVDCV 271
Ice plant           ------LTREKDCGRRKDTSQYQEKRMLSNLEKTDACLYQD--HEDRLLAVGTRFGETDS 255
Castor oil plant A  GKVKRPESLKRAHPSSYQDHRSSSVDFLRSLKGSKGQLDQEFVTVQDKAVHKEKSWEEYA 333
Poplar A            GKISSTKSLKRTYSSSNQEYRKNSVNVLKCLPGTNEQLNQELVTMPDKTVIGDNILVEYR 323
Grape vine A        ---------KRARTSLTKENKRNVVVDTNRLEDIHDSLHQGSMTLPENTDLPNP---SKA 281
Lemna               -------------------DAEKSGSS---------------------------------- 194
Sorghum B           -----------QILKDKT-GRPDPKVSPFM--DRLKKYNVADKQYSEAESYQMRTRNEDA 300
Sorghum A           -----------SIQASEKFKDKYAKLCQMR--NKVSNINRSD-----NNSCQPTSVNGKS 290
Maize               -----------SFQASEKFKDKYAKLCQMR--NKASNINHCD-----NNGCQPASVNGNF 293
Rice A              -----------FHASKDMFESRHAKVYPKM--DKTGIINDSDEPHGGNSGHQATSRNGGS 310
Rice B              -----------FEASKDMFGSKHAKVCP-----KTGTINDLDEPHLENSEHQATSRNGSS 303


Barley              AESQNAPKAGNGPYST---DIACNGA-SNLSEKGLRETGEKRKRSTGHHDVQR------- 355
Arabidopsis         KTRLKDTDNGAESHLATENHSQEGHGSPEDIDNDREYSKSRACASLQQINEEAS------ 299
Wheat               AESQNAAKAGNGPYST---DVACNGA-SNLSEKGLRETGEKRKRSTGHHDVQR------- 363
Castor oil plant B  PELTRELEKGNGPQPMSDSHSTEDLNSPNEPEIDSEHHGDRSYMSVQFGNGDKS------ 330
Poplar B            PESRRQKEKINIFQPGNDSHLRKDCSSPNEPEIDSECFGDKTCG---------------- 273
Grape vine B        S-VETARDAWNASRVRSSSYSGDGLGSPSEPDNDGACRGDKTCGTLQKGNVDTN------ 324
Ice plant           EPPLESTHKVMSLRLMHNPLKGCGYNDVDAVNIEMPRLEEHLLER---ENIDRA------ 306
Castor oil plant A  IGNDKENAAKVTSKLCYRLPLRDDNRSCNVIENSRKNHEDKQNGSLQVGDVERH------ 387
Poplar A            VVTGKENPSKVRSELYSRALLQDDNRNRCGLEKRSKYREDKQSGSLKAGDLERN------ 377
Grape vine A        VGGGYVSTS-------PKPSLLDGHRRSGGLEHELE--EQKESESLQMGSIDRN------ 326
Lemna               ------------------------GSTEKIDSSGDDAADRMVR---------------- 213
Sorghum B           VKTQNPPKNGSVLLSKPYDDREQNGD-SDILKHGLRDTGEKRKRS--HHGVEQN------ 351
Sorghum A           TEAKNPTATRNPSSCKPCTDVDSSNWNSNLLERSPREGGAKRKR--QHHSGEQN------ 342
Maize               TEAKNPTAARNTSSCKPCTDVDSSNRKSNLLERSPREVGAKRKR--GHHNGEQN------ 345
Rice A              MKFQNPPMRRNEISSNPSS--ENTDRHYNLPQGGIEETGTKRKRLLEQHDAEKSDDVSRL 368
Rice B              VKFQNPPVRRNTISAKPSPGIENTNGHCNLPQGGLKEAGTKRKRLEAQDNAEK------- 356
                                                    .       :


Barley              ---------DDSSDSSVESLPELEIS-PDDVVGAIGPKHFWKARRAIVNQQRVFAVQVFE 405
Arabidopsis         --------DDVSDDSMVDSISSIDVS-PDDVVGILGQKRFWRARKAIANQQRVFAVQLFE 350
Wheat               ---------DDSSDSSVESLPDLEIS-PDDVVGAIGPKHFWKARRAIVNQQRVFAVQVFE 413
Castor oil plant B  --------DDVSEISMLDSVSALDVS-PDDVVGIIGQKHFWKARRAIVSQQRLFAVQVFE 381
Poplar B            --------NDASETSMVDSVSVLDIS-PDDVVGIIGQKHFWKARRAIANQQRVFSVQLFE 324
Grape vine B        --------DDLSETSMVDSMSGLDIT-PDDVVGIIGQKHFWKARRAIVNQQRVFAVQVFE 375
Ice plant           --------NDVSETSMVDSVSGVEVC-PDDVVGIIGRKHFWKARTAIVNQQRVFAVQVFE 357
Castor oil plant A  --------NDGSETSLVDSLSALEIS-PDDVVRIIGEKQFWKARRIIVNQQRAFTVQVSE 438
Poplar A            --------DDAAETSMVDSVTALEIT-PDDVVGVIGEKQFWKARTAIVNQQRVFAAQVFE 428
Grape vine A        --------CHVSNANMVGSMLGFDIS-PDDVVGIIGHKHFWKTRNAIVNQQRVFAVQVFE 377
Lemna               --------DDASERLLVDSREAADAYNPDNLVGLIGLKHFWKARRAIISQQRVLALQVFE 265
Sorghum B           ---------DDLSDSSVEFLAGMEIS-PDDVVGAIGPKHFWKARRAIVNQQRVFAVQVFE 401
Sorghum A           ---------DDLSDDSVECIPGWELS-PDEIAGAIGPKHFWKARRAIQNQQRVFAVQVFE 392
Maize               ---------DDLSDSSVECIPGGEIS-PDEIVAAIGPKHFWKARRAIQNQQRVFAVQVFE 395
Rice A              LEQHDAENIDDVSDSSVECITGWEIS-PDKIVGAIGTKHFWKARRAIMNQQRVFAVQVFE 427
Rice B              --------IDDLSDSSVECITAWEIS-PDEIVGAIGAKHFWKARRAIINQQRVFAAQVFE 407
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Fig. S3. (Continued)

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Barley              LHRLIKVQKLIAASPHLLIEGDPCLG-------SALVTSKKKTAAANVEKQLLSAKSKDD 458
Arabidopsis         LHRLIKVQKLIAASPDLLLDEIS-FLG----KVSAKSYPVKKLLPSEFLVKPPLPHVVVK 405
Wheat               LHRLIKVQKLIAASPHLLIEGDPCLG-------SALVTSKKKTAAANVEKQLLSAKSKDD 466
Castor oil plant B  LHRLIKVQRLIAGSPHLLLEESTYLG------KPSMKVSPAKKPPSENVVTPPVHVSKRK 435
Poplar B            LHRLIKVQQLIAGSPHVLLEEEVHLA------KPPMKGSPCKNLPSECAVTPPVHVAKHK 378
Grape vine B        LHRLIKVQRLIAGSPHLMVDESAYLG------KPSLKSSPAKKLPLEYVVKPPPNMVMHK 429
Ice plant           LHRLLKVQKHIAGSPHVLLEGAAFVG------KTTLKDSAAKKFSSEFGVKAFVHTIKQK 411
Castor oil plant A  LHRLIKVQKLIAGSPALLLKDKFYLG------KAFLKASEAKKVPSNYAIEQPPPIVKPK 492
Poplar A            LHRLIKVQKLIAGSPHLLLEDNLYVG------RASLKVSQINKVPSKCAMVD-----KPK 477
Grape vine A        LHRLIKVQRLIAGSPEGQLDNNLYLAEPASSTKKLPSESPTKKLPSESVQQLPSQIADPK 437
Lemna               LHRLMNIQKLLAESPQLLLEDASSFHG----SPAAPS----KSQPVDTSVKPIDPTVNAT 317
Sorghum B           LHRLIKVQKLIAASPHLLIEGDPCLG-------KSLAASKKK-LAGDVEKQLQSAKN-ND 452
Sorghum A           LHKLIKVQKLIAASPHLLIEGDPVLG-------NALMGKRNKLPKGNLKVQTLSITN--K 443
Maize               LHKLIKVQKLIAASPHLLIEGDPVLG-------NALTGKRNKLPKGNSKVQTLSITN--K 446
Rice A              LHKLVKVQKLIAASPHVLIESDPCLG-------NALLGSKNKLVEENLKAQPLLVAT--I 478
Rice B              LHKLVKVQKLIAASPHVLIEGDPCLG-------NALLASKKKMAEENLKAQPVLVAT--N 458
                    **:*:::*: :* **   :.    .               :    .

Barley              DDAQLTLQQVEYSKDNTEGNQASPSQDNDLVEVRHENQAASNGAVSSNPPAMPAPTDNKQ 518
Arabidopsis         QRGDSEKTDQHKMESSAENVVGRLSNQGHH-------QQSNYMPFANNPPASPAPNGYCF 458
Wheat               DDAQLTLQQAEYSKDNTEGNQASPSQGNDVVEVRHENQAASNGAVSSNPPAMPAPPDNKQ 526
Castor oil plant B  YDPEKLNHNMEYSAENAVGK--FSSVKNGS-------QPSNCGPYTGNPKPVPVAADSKM 486
Poplar B            DNSENPNHKMECFAENAVGKTPFASVKNG--------QPPNFGPHAG-PTTVPMASDTKM 429
Grape vine B        DDYERASHQLECSAENAVGKTHLPSVKNGN-------PPSNYGPYIGNPPPAPAPTDSKM 482
Ice plant           DDSRKPTDKTEGTAENAVPK-AAPHSQNAV-------QPAGYPPASS----PPVNTDPKM 459
Castor oil plant A  DGSQKPHSSTEFAEENAVAKLSLSAVNNEVSKGLHT-NQSNYGSDSGGHLPAPVATNSGP 551
Poplar A            DHSQKQHTSADFAGENVVGKLPLPSTNDETSKEPIS-QRSNY---SGSAPPAPVATTAKP 533
Grape vine A        NGSQKQDSNNEGAVKDAVGNPPFASP-VDVDKIYAA-QQTNQRP-LENQPPVSMATDTQP 494
Lemna               QPADRKEVLAPEEETRGGEVVP----------------------PALPAGPAMSDGKSG 354
Sorghum B           EVQPTQQQQLEHSKENTEANQPSPSQD-DAAGVQHNNQAAINGAVSSNPPSMPTPSDNKQ 511
Sorghum A           DDIQPTLEQPELSKQNTEGNPSHHSRDDGLDDNHHD-QAAANETFTSNPPAIPVAPDNKQ 502
Maize               DDIQPTLEQPELSKQDTEGNLLAHSHDDGLGDNHHN-QAATNETFTSNPPAMHVAPDNKQ 505
Rice A              DDVEPSLQQPEVSKENTEDSP-PSPHDTGLGSGQRD-QAATNGVSKSNRRATPVASDNKQ 536
Rice B              DDVQPSLQEPELSKENSEENP-PSPRDTAPVSGHHD-QTAKIGASKSNLRATPVASDNRQ 516

Barley              NNW--CAPPPQNQWLVPVMSPSEGLVYKPYTGPCPPAGSFLAP-FYASCAPLSLPSTAGE 575
Arabidopsis         PPQ-PPPSGNHQQWLIPVMSPSEGLIYKPHPGMA-----HTGH-YGGYYGHYMPTPMVMP 511
Wheat               NNW--CAPPPQNQWLVPVMSPSEGFVYKPYTGPCPPAGSILAP-FYASCAPLSLPSTAGE 583
Castor oil plant B  APW-CFQHSLGHQWLVPVMSPSEGLVYKPYAAP-----GFMGS-VCGGCRPFGPSPVTGN 539
Poplar B            APW-CFHPPPGLQWLVPVMSPSEGFVYKPYTAP-----GFMGS-GCGGCGPFGPIPLTDN 482
Grape vine B        GPW-CYPQPPGHQWLVPVMSPSEGLVYKPYPGP-----GFMST-VCGGCGPMGSAPMTGS 535
Ice plant           NPW-SYPQPQVHQWLVPVMTPSEGLVYKPYPAPP----GMVGP-GCGGYGPGGPTSVGGN 513
Castor oil plant A  SPW-CFPPP-SNQWLVPVMSPSEGLVYKPYTGPCPPTAGFMAQ-VYGNCAPVSLDGEHGD 608
Poplar A            SPR-CYPPP-GNQWLVPVMSPSEGLVYKPYAGPCPPVSRFMEP-VYGSCGPISLAPGGGD 590
Grape vine A        TSW-CFHPSQGNQWLVPVMSPSEGLIYKPYAGQCSPTPRLMSP-FYGNYRPVNLTVMGGD 552
Lemna               PLP-IQVAGNH--WLFPVMSPTEGLIYKP----------------------FYKPENMVL- 389
Sorghum B           NSW--CIPPPPSQWLVPVMSPSEGLVYKPYSGHCPPAGSFMAPPFFASCGPVSLPSTAGD 569
Sorghum A           NNW--CMNPPQNQWLVPVMSPSEGLVYKPYAGPCPPVGNLLTP-FYANCTPLRLPSTP-- 557
Maize               NNW--CMNPPQNQWLVPVMSPSEGLVYKPFAGPCPPVGNLLTP-FYANCAPSRLPSTP-- 560
Rice A              NNWGVQLQPPQNQWLVPVMSPLEGLVYKPYSGPCPPAGSILAP-FYANCTPLSLPSTAGD 595
Rice B              NNCGVQLQPPQNQWLIPVMSPSEGLVYKPYSGPCPPAGSILAP-FYANCTPLRLPSTTGD 575
                              **.***:* **::***

Barley              FMNSPYGIPMPHQ--PQHMGVGGPPAMPPMYFPPFSVPVMN-PVVSSSAVEQVSRVAAAR 632
Arabidopsis         QYHPGMGFPPPGN----------------GYFPPYGMMPTIMNPYCSSQQQQQQQPNEQM 555
Wheat               FMNSPYGIPMPHQ--PQHMGVGGPPAMPPMYFPPFSVPVMN-PVVSSSAVEQVSRVATAR 640
Castor oil plant B  FMDPTYGVPASHHPHQGTMPMPGVPALGHGYFPPYGMPIMS-STMPGSAVEQMN------ 592
Poplar B            FMTSAYAIPTSHY-HQGIGVSPGAPPVGNACFAPYGMPGMN-PAISGSAGSGS------- 533
Grape vine B        FINPAYGVPSSHH-HQGIGVHPGTPPIGHGYFPPYGMSVMNHPTISGSAVEQMNRFAG-H 593
Ice plant           MMNMGYGMPNPHF--QGAVHFG-----GQGYFPPYPMPMMS-PVMSGSAVDQMNQFSGGP 565
Castor oil plant A  FINGAYGVQASHQ--NGIGILPSDPPLGQNYFPPYGMPVMT-PSISGLLFGQVSPFNG-P 664
Poplar A            FLNAAYSVSASNH--EEIGILPGNPHFGQTFFQPFGMPVMN-PSICDSAVEQIRPRIG-P 646
Grape vine A        FFNTTYGIPISLQ--QGIEIVPSNPFLGQTYFPPYGKPLVN-PSTSGSAVEQMNLSVG-D 608
Lemna               -------LPPP-------------------------------YCVSQPVSGSAVDQ-- 407
Sorghum B           FMNSAYGVAMPHQ--PQHMGVPGPPPMPPMYFPPFSMPVMN-PAVSASAVEQVSHVAASQ 626
Sorghum A           -----YGVPMPHQ--PQQMVPPGAPAMHMNYFPPFSMPVMN-PGTPASAVEQGSHAAAPQ 609
Maize               -----YGVPIPHQ--PQHMVPPGAPAMHMNYFPPFSMPVMN-PGTPASAVEQGSHAAAPQ 612
Rice A              FMNSAYGVPMPHQ--PQHMGAPGPPSMPMNYFPPFSIPVMN-PTAPAPVVEQGRHPSMPQ 652
Rice B              FMNSAYGVPIPHQ--PQHMGAPGTPTMPMNYFPPFSVPVMN-PVALASAVEQGRHPSMPQ 632
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Fig. S3. (Continued)

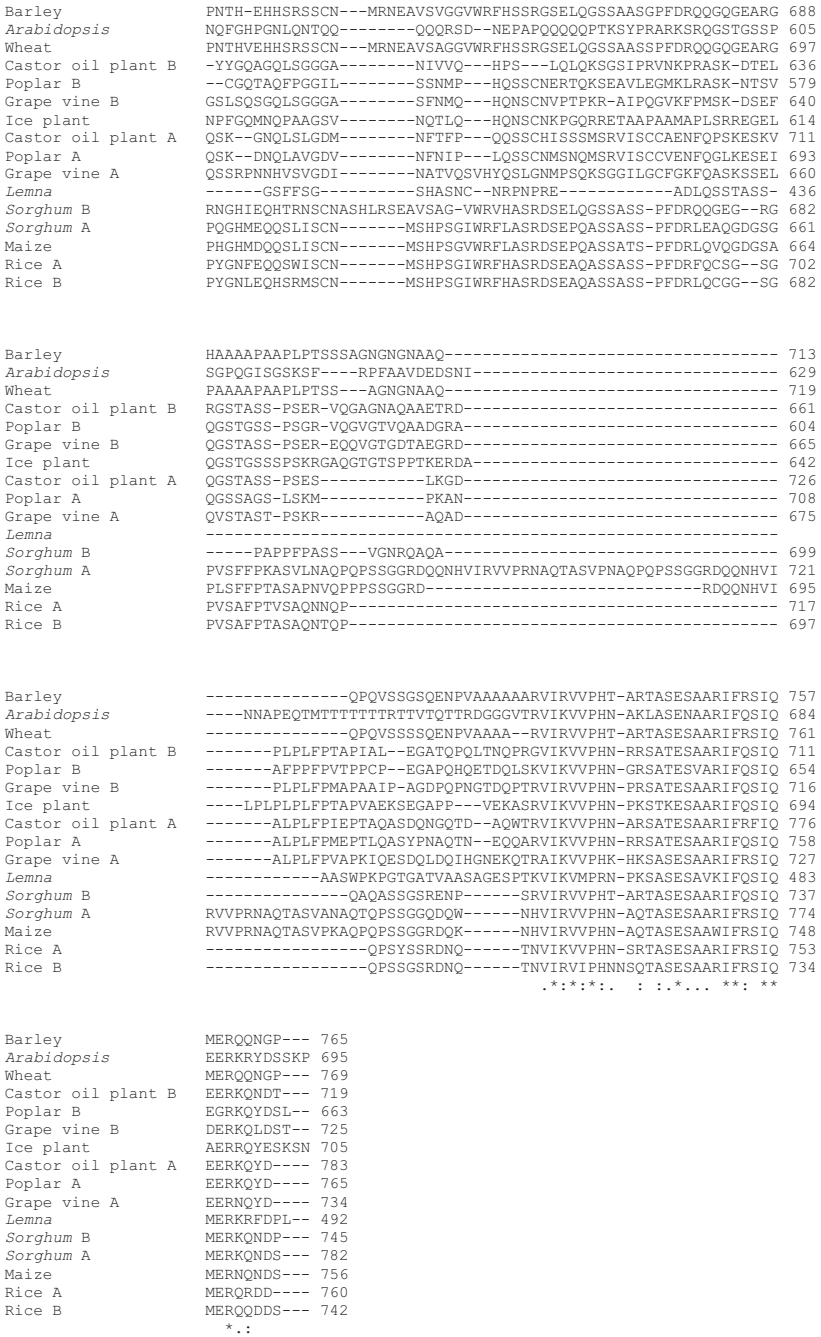

Fig. S3. Alignment of polypeptides deduced from *Elf3* and *Elf3*-like genes from different plant species. Identical residues are marked with asterisks. Conserved substitutions are marked with colons. Semiconserved substitutions are marked with dots. The amino acid residues R43 and N44 are affected by the point mutations in *mat-a.1067* and *mat-a.45* causing the amino acid substitutions R43H and N44I, respectively. R43 and N44 are located in the most conserved region of ELF3 and are indicated with bold letters and arrows. The NCBI GenInfo Identifier number of each protein in the alignment is: *A. thaliana*, GI:15225220; wheat (*Triticum aestivum*), GI:118767203; *S. bicolor* A, GI:242057743; *S. bicolor* B, GI:242089093; rice (*O. sativa*) A, GI:5803261; rice (*O. sativa*) B, GI:222618691; maize (*Zea mays*), GI:293334705; castor oil plant (*Ricinus communis*) A, GI:255549694; castor oil plant (*R. communis*) B, GI:255550864; grape vine (*Vitis vinifera*) A, GI:225442371; grape vine (*V. vinifera*) B, GI:225429428; ice plant (*Mesembryanthemum crystallinum*), GI:34499887; poplar (*Populus trichocarpa*) A, GI:224070734; poplar (*P. trichocarpa*) B, GI:224092236; *Lemna paucicostata,* GI:63003182.

Table S1. Cultivars and pedigree accessions in which cultivar Mari, carrying the *mat-a.8* mutation, has been used in crosses

Table S1 (DOC)

Table S2. Detailed description of *mat-a*, *eam8*, and *ert-o* mutants

Table S2 (DOC)