

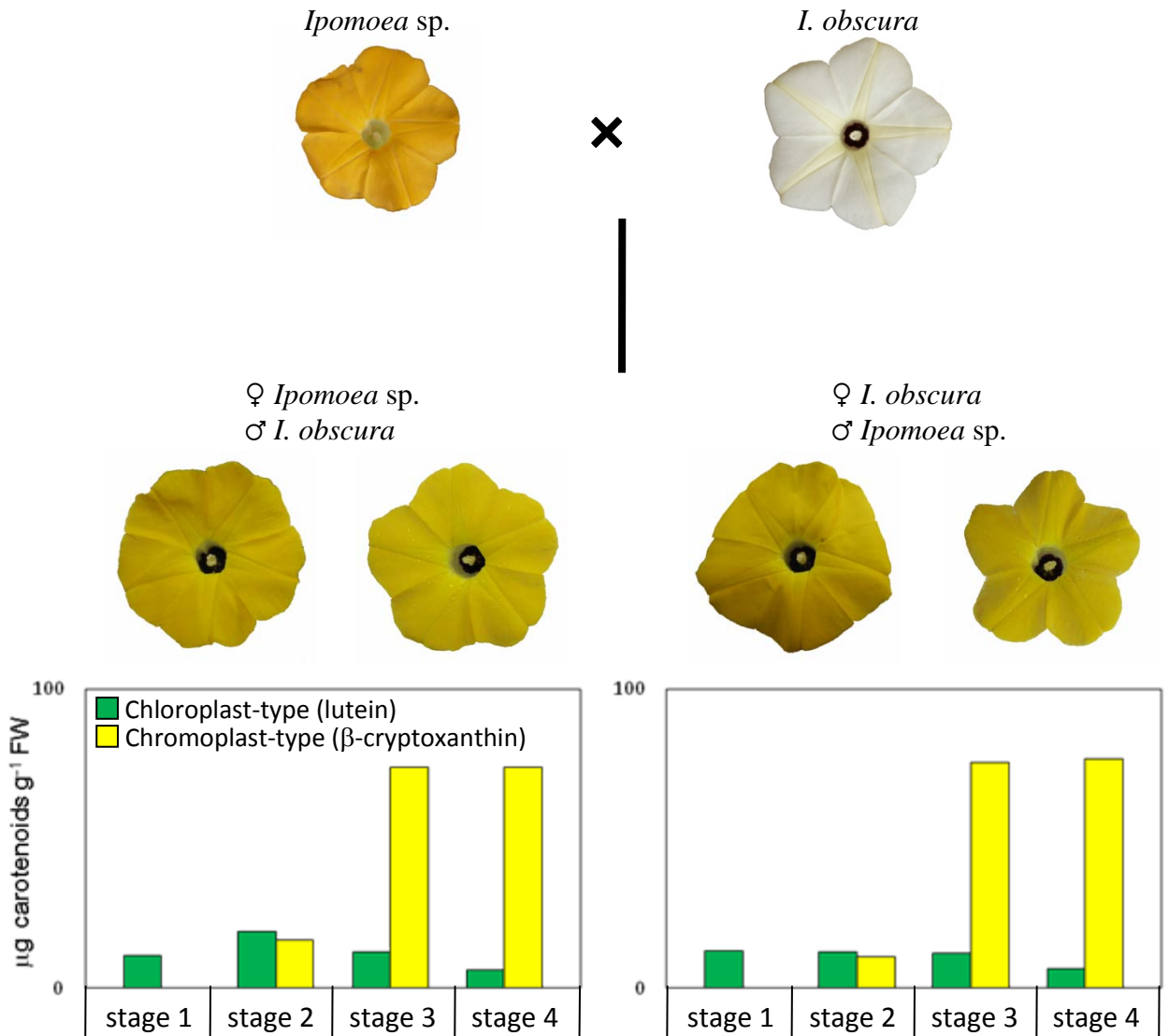
# Analyses of carotenoid composition and carotenogenic gene expression during *Ipomoea* petal development

Chihiro Yamamizo, Sanae Kishimoto and Akemi Ohmiya

## Supplementary Data

**Supplemental Table S1.** Genes encoding isoprenoid and carotenoid enzymes isolated from *Ipomoea* sp.

Gene	cDNA		Peptide	
	Full-length (bp)	ORF (bp)	MW (kDa)	Identity with homologs
<i>IPI</i>	890	708	27.2	<i>Solanum lycopersicum</i> (93%), <i>Nicotiana tabacum</i> (92%), <i>Ipomoea batatas</i> (91%)
<i>GGPS</i>	1185	1122	40.2	<i>Catharanthus roseus</i> (80%), <i>Antirrhinum majus</i> (76%), <i>Vitis vinifera</i> (72%)
<i>PSY</i>	1425	1320	49.3	<i>Nicotiana langsdorffii</i> (82%), <i>Coffea canephora</i> (82%), <i>Solanum lycopersicum</i> (81%)
<i>PDS</i>	2036	1719	63.6	<i>Nicotiana benthamiana</i> (84%), <i>Solanum lycopersicum</i> (83%), <i>Vitis vinifera</i> (82%)
<i>ZDS</i>	2014	1767	64.7	<i>Solanum lycopersicum</i> (82%), <i>Capsicum annuum</i> (82%), <i>Helianthus annuus</i> (81%)
<i>CRTISO</i>	2188	1809	66.1	<i>Vitis vinifera</i> (86%), <i>Chrysanthemum morifolium</i> (85%), <i>Daucus carota</i> (78%)
<i>LCYE</i>	1672	1248	47.5	<i>Coffea canephora</i> (75%), <i>Vitis vinifera</i> (74%), <i>Daucus carota</i> (73%)
<i>LCYB</i>	1562	1506	56.4	<i>Nicotiana tabacum</i> (86%), <i>Solanum lycopersicum</i> (86%), <i>Capsicum annuum</i> (86%)
<i>CHYB</i>	1126	930	34.6	<i>Coffea arabica</i> (82%), <i>Solanum lycopersicum</i> (79%), <i>Solanum lycopersicum</i> (78%) ( <i>CrtR-b1</i> ) (CrtR-b2)



**Supplemental Figure S1.** Crossing between *Ipomoea* sp. and *I. obscura*. Petals of all progenies accumulated the same chromoplast-type carotenoids as in *Ipomoea* sp.

**A**

```

CHYB      --MAVGISIAASSGTVYNCFSLVRPATHSASPPSLLFSPLSRRRFRSSVLSRRKPRLTV
CRTR-B2   --MAAGISASASSRTIRLRHNPFLLSPKASASTAPPVLLFFSPLTRNFG-AILLRKRKPLAV
CRTR-B1   MAAAARISASASTSRTFYFRHSPPFLGPKPTSTTSHVSPISPFSLNLG-PILRSRRKPSFTV
1.....10.....20.....30.....40.....50.....60

CHYB      CFVLEDEKLESQVQIRAEIEKAIKQIS-----ASRLAEKLARKR SERSTYLVAAVMS
CRTR-B2   CFVLENEKLNSTIESESEVIEDRIQVEINEEKSLAASWLAEKLARKKSERFTYLVAAVMS
CRTR-B1   CFVLEDEKLLKPFQFDDEAEDFEKKEIEEQIL-----ATRLEKLARKKSERFTYLVAAIMS
.....70.....80.....90.....100.....110.....120

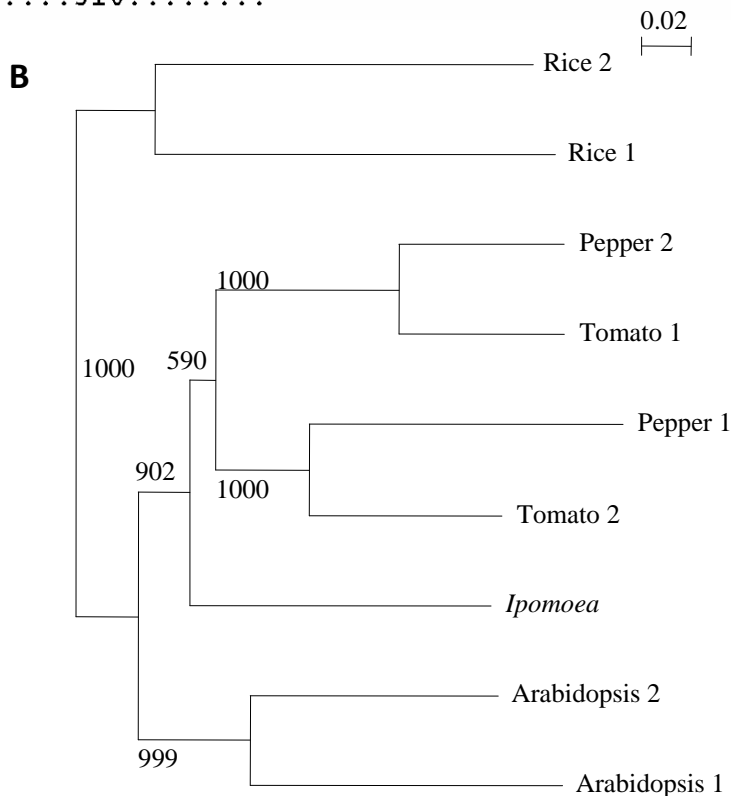
CHYB      SLGITSMAVLSVYYRFAWQMEGGAVPYTEMFGTFALSVGAAVGMEFWARWAHRALWHASL
CRTR-B2   SLGITSMAIILAVYYRFSWQMEGGEVPFSEMLATFTLSFGAAVGMEYWARWAHRALWHASL
CRTR-B1   SFGITSMAVMVAVYYRFSWQMEGGEVPVTEMLGTFALSVGAAVGMEFWARWAHKAALWHASL
.....130.....140.....150.....160.....170.....180

CHYB      WHMHESHKPREGPFELNDVFAIILNAVPAIALLSYGFFHKGLVPGLCFGAGLGITVFGMA
CRTR-B2   WHMHESHHRPREGPFEMNDVFAITNAVPAIALLSYGFFHKGLVVPGLCFGAGLGITVFGMA
CRTR-B1   WHMHESHKPREGPFELNDVFAITNAVPAIALLNYGFFHKGLIAGLFCGAGLGITVFGMA
.....190.....200.....210.....220.....230.....240

CHYB      YMFVHDGLVHKRFPVGPVIANVYFRRVAAAHQLHHTDKFNGVPYGLFLGPKLEEEVGGLN
CRTR-B2   YMFVHDGLVHKRFPVGPVIANVYFRRVAAAHQLHHSDFDGVVYGLFLGPKLEEEVGGLE
CRTR-B1   YMFVHDGLVHKRFPVGPVIANVYLRKVVAAAHSLHHSDFKFNVPYGLFFGPKLEEEVGGTE
.....250.....260.....270.....280.....290.....300

CHYB      DLEVEVSRRIKMSRGR-
CRTR-B2   ELEKEVNRRIKIS-KGLL
CRTR-B1   ELEKEVIRRTLS-KGS-
.....310.....

```



**Supplemental Figure S2.** Sequence comparison of CHYB among various plant species. A, Alignment of amino acid sequence of *Ipomoea* CHYB with tomato CRTR sequences. Identical amino acids are indicated with black backgrounds. The plastid transit peptide in *Ipomoea* CHYB identified using ChloroP v1.1 is indicated by a bar. B, ClustalW tree analysis of *Ipomoea* CHYB and CHYB homologs in various plant species. Tomato 1 (CRTR-B1; CAB55625), Tomato 2 (CRTR-B2; CAB55626), Arabidopsis 1 (NP\_200070), Arabidopsis 2 (AAC49443), Pepper 1 (CRTR-B2; CAA70427), Pepper 2 (CRTR-B1; CAA70888), Rice 1 (AAP54790), and Rice 2 (XP\_473611). Numbers at branch points indicate bootstrap values (1,000 replicates).