Starch Biosynthesis in Rice Endosperm Requires the Presence of Either Starch Synthase I or IIIa

Naoko Fujita[1], Rui Satoh, Aki Hayashi, Momoko Kodama, Rumiko Itoh, Satomi Aihara, Yasunori Nakamura

Supplementary Material

Figure S1. Pleiotropic effect of the deficiency or reduction of SSI or SSIIIa activity on SS, DBE, BE and PHO activity in the TO line, WO line, and *ss1^{L}ss1^{L}/ss3ass3a*, *ss1* mutant (*ΔSSI, e7, i2-1*), *ss3a* mutant (*ΔSSIIIa*, *e1*), and wild type Nipponbare when measured by native-PAGE/activity staining of their developing endosperms. SSIIIa and SSI (SS activity staining), ISA (isoamylase), PUL (pullulanase), PHO (phosphorylase) (DBE activity staining), and BEI, BEIIa, BEIIb and PHO (BE activity staining) are indicated by arrowheads. Nip: Nipponbare.

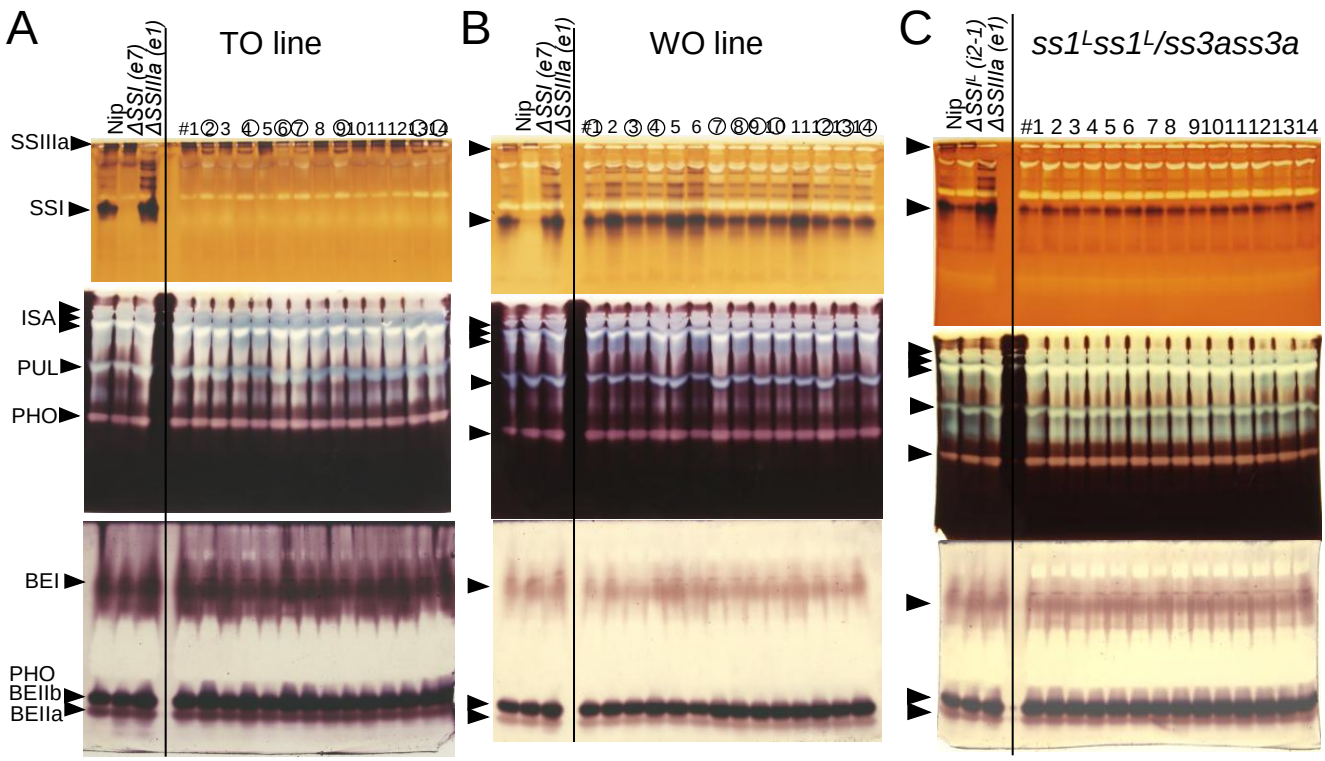
A
TO line
Nip
ΔSSI (e7)
ΔSSIIIa (e1)
#1 2 3 4 5 6 7 8 9 10 11 12 13 14
SSIIIa
SSI
ISA
PUL
PHO
BEI
PHO
BEIIb
BEIIa
B
WO line
Nip
ΔSSI (e7)
ΔSSIIIa (e1)
#1 2 3 4 5 6 7 8 9 10 11 12 13 14
C
ss1ᴸss1ᴸ/ss3ass3a
Nip
ΔSSIᴸ (i2-1)
ΔSSIIIa (e1)
#1 2 3 4 5 6 7 8 9 10 11 12 13 14

Fig. S1

Suppl. table 1 Segregation of F_2 and F_3 to F_5 seeds of the TO and WO lines.

F_2 seeds

		Translucent	White core	Opaque	Empty[a]	Others[b]	Total
F_2 seeds ('04)	#1[c]	115 (36)[d]	39 (12)	33 (10)	80 (25)	54 (17)	321 (100)
	#2	92 (43)	26 (12)	28 (13)	39 (18)	28 (13)	213 (100)
Total		**207 (39)**	**65 (12)**	**61 (11)**	**119 (22)**	**82 (15)**	**534 (100)**

F_3 to F_5 seeds of TO line

		Translucent	White core	Opaque	Empty	Others	Total
F_3 seeds ('06)	#1	309 (34)	0 (0)	257 (28)	322 (35)	29 (3)	917 (100)
	#2	298 (31)	0 (0)	340 (36)	292 (31)	21 (2)	951 (100)
	#3	176 (37)	0 (0)	179 (37)	126 (26)	0 (0)	481 (100)
	#4	335 (38)	0 (0)	334 (38)	212 (24)	2 (0)	883 (100)
	#5	378 (34)	0 (0)	304 (28)	323 (29)	98 (9)	1103 (100)
	#6	602 (47)	0 (0)	474 (37)	217 (17)	0 (0)	1293 (100)
Total		**2098 (37)**	**0 (0)**	**1888 (34)**	**1492 (27)**	**150 (3)**	**5628 (100)**
F_4 seeds ('07)	#1	539 (43)	0 (0)	505 (40)	172 (14)	50 (4)	1266 (100)
	#2	507 (45)	0 (0)	464 (41)	112 (10)	54 (5)	1137 (100)
	#3	229 (37)	0 (0)	211 (34)	130 (21)	55 (9)	625 (100)
Total		**1275 (42)**	**0 (0)**	**1180 (39)**	**414 (14)**	**159 (5)**	**3028 (100)**
F_5 seeds ('08)	#1	160 (43)	0 (0)	116 (31)	82 (22)	15 (4)	373 (100)
	#2	61 (29)	0 (0)	69 (33)	77 (37)	1 (0)	208 (100)
	#3	82 (27)	0 (0)	79 (26)	141 (46)	6 (2)	308 (100)
	#4	102 (36)	0 (0)	86 (31)	89 (32)	3 (1)	280 (100)
Total		**405 (35)**	**0 (0)**	**350 (30)**	**389 (33)**	**25 (2)**	**1169 (100)**

F_3 to F_4 seeds of WO line

		Translucent	White core	Opaque	Empty	Others	Total
F_3 seeds ('07)	#1	0 (0)	419 (36)	386 (33)	305 (26)	51 (4)	1161 (100)
	#2	0 (0)	342 (30)	354 (31)	383 (33)	79 (7)	1158 (100)
	#3	0 (0)	341 (30)	366 (32)	364 (32)	70 (6)	1141 (100)
Total		**0 (0)**	**1102 (32)**	**1106 (32)**	**1052 (30)**	**200 (6)**	**3460 (100)**
F_4 seeds ('08)	#1	0 (0)	77 (25)	78 (25)	148 (47)	11 (4)	314 (100)
	#2	0 (0)	88 (29)	77 (25)	118 (39)	21 (7)	304 (100)
	#3	0 (0)	41 (21)	59 (30)	92 (46)	7 (4)	199 (100)
	#4	0 (0)	64 (17)	88 (23)	233 (60)	1 (0)	386 (100)
	#5	0 (0)	69 (26)	86 (32)	109 (41)	4 (1)	268 (100)
Total		**0 (0)**	**339 (23)**	**388 (26)**	**700 (48)**	**44 (3)**	**1471 (100)**

[a]No endosperm, but have a hull.

[b]Unidentified seeds.

[c]Number of Individual rice plants.

[d]Percent of total number of seeds.