

A

```

ATGGCGACCCGAGCCAGAGCAACGATCCTTCTCTCTCGCGGCTGTCTCTTCCGCGCGGCGGGC
M A T R A R A T I L L L L A A V L F A A A A
GCGGCTCAGGTGAGGATCGCCGCCGAGACATCACTGCGGCGCTGCCAGCGGTGCGAGCAG
A A S G E D R R R E T S L R R C L Q R C E Q
GACCGGCGCGTACGAGCGGGCCGGTGCAGGAGTCAAAAGACCAGCAACAGCAGCAGCAG
D R P P Y E R A R C V Q E C K D Q Q Q Q Q Q
GAACGGGACGAGAGCAGCGGGGACGACGACGACCGCGGACCGCGGCGCGGAGGGG
E R R R E H G G H D D D R R D R D R R G E G
TCGTGGAGGAGGAGGACGAGGCGCGAGCGGGAAGCGGCGGCGGCGGTACGTGTTGCGCGG
S S E E E D E G R E R G S R R R P Y V F G R
CGCAGCTTCGGCAAGTCGTGCGAGCGACAGGGCTCCGTACGGCTCCTCCGCGGTTCCACGAG
R S F R Q V V R S D Q G S V R L L P P F H V
CGCTCCAGCTCCTGCGCGCATCAAGAACTACCGGTCGCGGTGCTCGAGGCGAACCCGCGCTCC
A S S L L R G I K N Y R V A V L E A N P R S
TTCTGTCAGCCACACCGGACCGCAGCTGATCTGCTACGTGCGCCAAAGCGAGGGAGTGGTG
F V M P T H T D A H C I C Y V A Q G E G V V
GCGATCATCGAGAAGCGGAGAGTGGTCTACGCCATCCGGCAAGGCGAGCTTCTGTGGCGCCG
A I I E N G E K W S Y A I R Q G D V F V A P
GCGGGGAGTCAATTAACGGCAACACCGAGCGGAGGAAAGTGTATCGTTACCAAGATTCTC
A G T I N Y L A N T D G R R K L I V T K I L
CATACCATCTCCGTCCTGGCCAGATCCAGTTCTTCTCGCCCGAGGCGGGAGGAACCCGGAGTCA
H T I S V P G Q I Q F F F A P G G R N P E S
TTCTTGTGAGCTTCAGCAAGGGCGTGCAGAGAGCTTTCAAGATTTTCGGAGGAGAAGCTGGAG
F L S S F S K G V Q R A A F K I S E E K L E
AAGCTGTGGGAAGCAGGACAAGGGGGTGTATCCGCGCGTGGAGGAGCAGGTGCGGGAGCTG
K L L G K Q D K G V I I R A S E E Q V R E L
CGGCGCAGCGTGGAGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGG
R R H A S E G G H G P H W P L P P F G E S S
CGCGGCCCTTCAACATCTGGAGCAGAGGCCAGGTTGCGCAACCGCCACGGCGGCGCTTACGAG
R G P F N I L E Q R P R F A N R H G R L Y E
GCGCAGCGCCGAGCTTCCAGCAGCTCGCCGAGCAGCAGATCGCGTCCGCGTGTCAACATCAC
A D A R S F H D L A E H D I R V A V V N I T
GCGGGATCCATGAACGCGCCGTTTACAACACCCGCGTCAAGGTGCGCTACGCTTGGAGCGG
A G S M N A P F Y N T R S V K V A Y V L D G
GAGGGAGGCGAGAGTGTGCGCCACCTGTGCGCGGCGGCGGCGGCGGCGGAGGAGGAG
E G E A E I V C P H L S R G G R G G E S E E
CGCCGCGGAGGCGGCAAGGGCAAGTGGTGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGG
R R R E R G K G K W R E E E E E E E Q Q K
GGCAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGG
G Q E E E E E Q V G Q G Y E T I R A R L S
CGCGGACAGGTGTTCTGTCGTCCTCCGCGCACCGATCGTGGTGACGTGCTCCGCGGACAGCACC
R G T V F V V P S G H P I V V T S S R D S T
CTCCAGATCGTCTGCTTCCAGCTCCAGCCAAACAACAGAGGATGTACTCGCGGGATGAAC
L Q I V C F D V H A N N N E R M Y L A G M N
AGCGTGTGAAGAAGTGGACCCGAGGCAAGGAGTGGCGTTCGCGGCGAGCGGAGGAGGAGT
S V L K K L D P Q A K E L A F A A S A R E V
GACGAGTGTCAACGCGCAGCAGGAGTCCGCGTTCCTCGCGGCGGAGGAGGAGGAGGAGGAGG
D E L L N A Q Q E S A F L A G P E K S G R R
GGCAGGAATCGGAGGACGAAGACCGCGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGG
G E E S E D E D R R R R R S H R G R G D E A
GTGGAGACGCTCCTGAGGATGGCAGCGCTCGCGGTGTGA
V E T L L R M A A A A V *

```

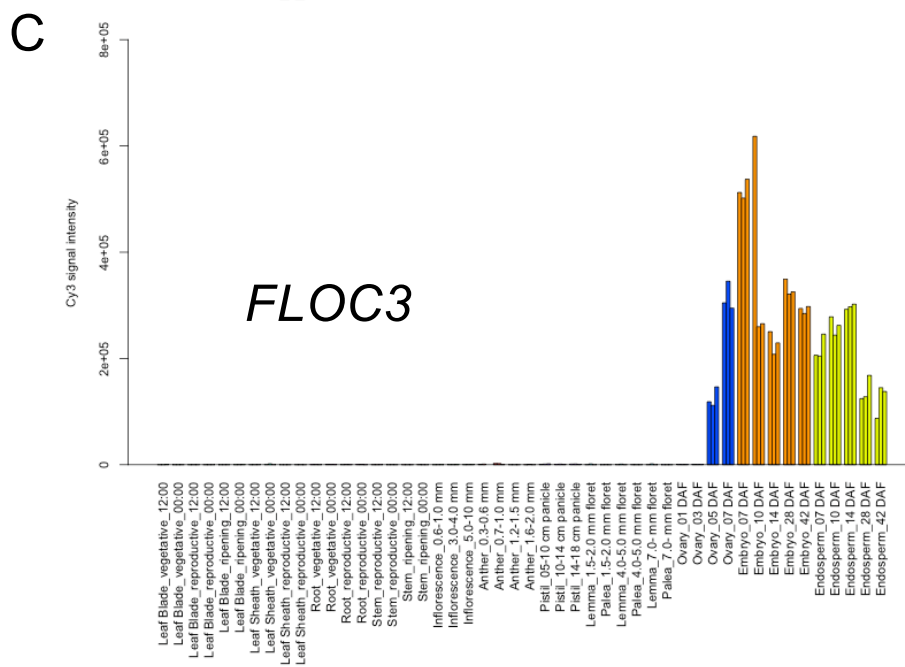
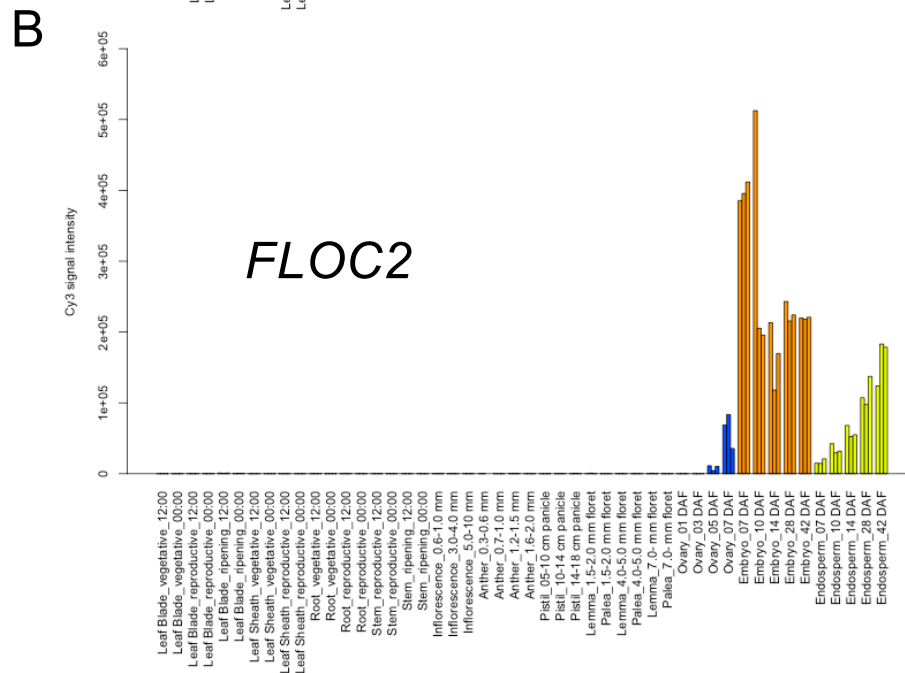
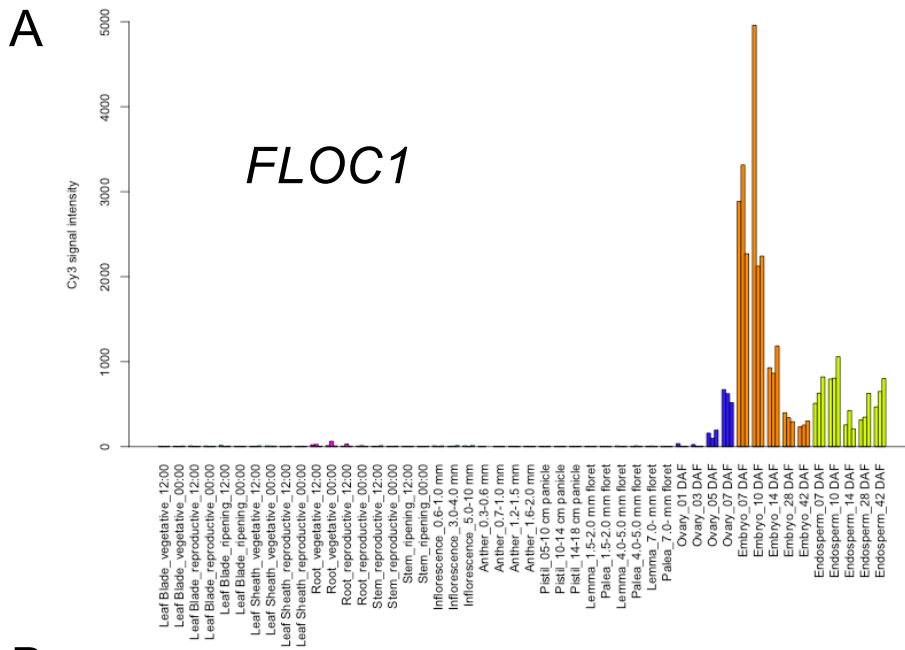
B

```

ATGGCCACGAGGGCACGGGCCACGATTCTTGTGCTTGTGCGGTGCTTTTCCGCGAGTGC
M A T R A R A T I L L L L A A V L F A A A A
GCTGCTCAGGTGAAGACCGGAGGCGGAGACTAGCCTCCGTGCTACAGCGGTGTGAACAG
A A S G E D R R R E T S L R R C L Q R C E Q
GATCGGCCACCTTACGAACGCGGAGATGCGTACAGGAATGCAAAAGACCAGCAGCAGCAGCAA
D R P P Y E R A R C V Q E C K D Q Q Q Q Q Q
GAGCGAAGACGTGAGCAGCGGGTACGACGATGATAGCGCGACAGGATCGACGGGCGAAGGG
E R R R E H G G H D D D R R D R D R R G E G
TCTTCCGAGGAGGAGGAGGAGGCTGAGCGGAGGAGCGTAGACGCCCTACGTTTTCGGACGC
S S E E E D E G R E R G S R R R P Y V F G R
AGGAGCTTCAGACAAGTCTGTGAGATCGGACCAAGGATCCGTTAGGCTTTCGCGCTTCCATCAG
R S F R Q V V R S D Q G S V R L L P P F H V
GCGTCTTCCCTTTCAGGGGATTAAGAAGTCCGAGTTGACGCTTAGAGGCAATCCCGGTCG
A S S L L R G I K N Y R V A V L E A N P R S
TTTGTATGCAACCCACACAGATCGCATTGCTATGCTATGTTGCGCAAGGAGAGGGGATGTC
F V M P T H T D A H C I C Y V A Q G E G V V
GCCATCATCGAAAATGGTGAAGTGGTCTACGCCATCAGACAGGGGATGCTTTGTAGTCTCC
A I I E N G E K W S Y A I R Q G D V F V A P
GCAGGTACGATTAACCTGCGCAATACGGATGGACGCGGAAAGTCTATCGTGACCAAGATTCTC
A G T I N Y L A N T D G R R K L I V T K I L
CACACTATCTCCGTTCCAGGCCAAATCCAGTTCTTCTTGTCCAGGCGGAAGGAACCCGAAAGC
H T I S V P G Q I Q F F F A P G G R N P E S
TTCTTGTGATCGTTTCAAGGGCGTGCAGCAGCGGCGGCTTCAAGATTTCCGAGGAAAAGTGGAG
F L S S F S K G V Q R A A F K I S E E K L E
AAACTCTAGGCAAGCAGGACAAGGGGGTATCATAAGGGCATCGGAGGACAAGTGAAGAACTC
K L L G K Q D K G V I I R A S E E Q V R E L
CGTAGGCATCGAGCGAAGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGGCGG
R R H A S E G G H G P H W P L P P F G E S S
CGCGGCCATTCACATCTTGGAGCAACCGGCCAGGTTTGGCAATAGACATGGGCGGCTGTATGAG
R G P F N I L E Q R P R F A N R H G R L Y E
GCCGATGCGCGCTCGTTTACGATCTGGCTGAACACGACATAAGGGTAGCGGTGTTAACATAACA
A D A R S F H D L A E H D I R V A V V N I T
GCGGGCTCTATGAATGCCCTTCTACAACACCCGAGCGTTAAGGTGGCGTATGCTTGGATGGC
A G S M N A P F Y N T R S V K V A Y V L D G
GAGGGAGAGGAGAGATTTGTGCGCCTACCTGAGTTCGAGGTTGAGAGGCGGTTAATCGGAGGAG
E G E A E I V C P H L S R G G R G G E S E E
CGCCGAGGAGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGG
R R R E R G K G K W R E E E E E E E Q Q K
GGCCAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGG
G Q E E E E E Q V G Q G Y E T I R A R L S
CGGGCACAGTGTTCGTGGTGCCTAGTGGCCACCGATAGTCTGATGCTTCAAGTCCGGACTCAACC
R G T V F V V P S G H P I V V T S S R D S T
CTCCAGATCGTCTGTTTCCAGCTGCACGCAACAACAGGAGGATGTACTCGCGGGATGAAT
L Q I V C F D V H A N N N E R M Y L A G M N
AGCGTGTGAAGAAGTGAACCCGAGGCAAGGAGTGGCGTTCGCGGCGAGCGGAGGAGGAGT
S V L K K L D P Q A K E L A F A A S A R E V
GACGAACTCTTAATGCCCAACAAGAGTGTGATCTTCTAGCGGAGCTGAGAAAAGCGGCGTAGA
D E L L N A Q Q E S A F L A G P E K S G R R
GGCAAGAGAGTGAAGTGAAGACCGCAGGAGGCGGCGGCTCACATCGCGGAAAGGGGCGATGAGGC
G E E S E D E D R R R R R S H R G R G D E A
GTGAGACCTTGTCCGATGGCGCGGCGGCGGCGGTC
V E T L L R M A A A A V

```

Supplementary Figure S1. Nucleotide sequence of *FLOC 1* cDNA and deduced amino acid sequence. (A) Nucleotide sequence of the native *FLOC1* cDNA registered by AK105347. (B) Nucleotide sequence of the artificial *FLOC1* gene. This gene was constructed to reduce the GC content of the gene without change of its deduced amino acid sequence.



Supplementary Figure S2. Expression patterns of *FLOC1* (A), *FLOC2* (B), and *FLOC3* (C). These data were obtained from the RiceXPro database (<http://ricexpro.dna.affrc.go.jp/>).

FLO2

TCAATTTGCACTTCTGTCAGCTAAaggtcccggtagatctcttt
S I C T S V S *

FLO2-MF

TCAATTTGCACTTCTGTCAGCgtcgacGAACAGAACTGATCTCTGAAGAAGACCTGGAA
S I C T S V S V D E Q K L I S E E D L E
----> myc tag

CAGAACTGATCTCTGAAGAAGACCTGGAACAGAACTGATCTCTGAAGAAGACCTGGAA
Q K L I S E E D L E Q K L I S E E D L E

CAGAACTGATCTCTGAAGAAGACCTGgaattcGACTACAAGGACCACGACGGCGACTAC
Q K L I S E E D L E F D Y K D H D G D Y
----> FLAG tag

AAGGACCACGACATCGACTACAAGGACGACGACACAAGTAAggatccaggtcccggtag
K D H D I D Y K D D D D K *

atctcttt

Supplementary Figure S3. Nucleotide sequences of the 3' region of the *FLO 2* gene and the *FLO2-MF* gene. Deduced amino acid sequences are shown below the nucleotide sequences. Termination codons are boxed.

Supplementary Table S1. List of peptides obtained by shot-gun proteomic analysis from WT developing seeds.

Score	Acc. No	Description
505	Os05g33570	pyruvate, phosphate dikinase
351	Os06g51084	1,4-alpha-glucan-branching enzyme
296	Os02g15169	glutelin
192	Os02g38920	glyceraldehyde-3-phosphate dehydrogenase
132	Os05g41970	SSA1 - 2S albumin seed storage family protein precursor
130	Os02g10800	mitochondrial carrier protein, putative
114	Os02g32660	1,4-alpha-glucan-branching enzyme
105	Os03g08010	elongation factor Tu
96	Os11g09280	OsPDIL1-1 protein disulfide isomerase PDIL1-1
90	Os03g49190	oleosin, putative
82	Os01g67860	fructose-bisphosphate aldolase isozyme
68	Os01g44220	glucose-1-phosphate adenylyltransferase large subunit
65	Os02g02410	DnaK family protein
64	Os08g25734	glucose-1-phosphate adenylyltransferase large subunit
64	Os07g11510	RAL6 - Seed allergenic protein RA5/RA14/RA17 precursor
62	Os10g25130	aminotransferase, classes I and II, domain containing protein
59	Os05g06310	60S ribosomal protein L18-3
58	Os10g35050	aquaporin protein, putative
56	Os04g52354	ribosomal protein S17
55	Os10g33800	lactate/malate dehydrogenase
51	Os01g46070	lactate/malate dehydrogenase
44	Os12g07180	transposon protein, putative
42	Os10g41410	nucleoside diphosphate kinase
41	Os04g08270	pullulanase precursor
38	Os08g43190	dehydrogenase
35	Os03g28330	sucrose synthase
35	Os02g28810	ribosomal protein
34	Os06g04200	starch synthase
33	Os05g24930	PPR repeat containing protein
32	Os02g54470	60S ribosomal protein L35a-3
31	Os07g11630	LTPL163 - Protease inhibitor/seed storage/LTP family protein precursor
30	Os03g46640	deoxyuridine 5-triphosphate nucleotidohydrolase
29	Os02g07260	phosphoglycerate kinase protein
27	Os01g62920	homeodomain protein
27	Os05g49880	lactate/malate dehydrogenase
26	Os12g14070	DnaK family protein
26	Os03g58430	40S ribosomal protein S15
25	Os08g16830	retrotransposon protein
25	Os05g35410	potassium channel AKT2/3
25	Os10g32720	AWPM-19-like membrane family protein
25	Os01g01060	40S ribosomal protein S5
22	Os07g42300	elongation factor protein
20	Os04g46200	oleosin
20	Os01g09150	expressed protein
19	Os02g06700	ribosomal protein

Detected peptides are indicated the name of the gene, in which the corresponding region are encoded. The predicted protein name are also shown.

Supplementary Table S2. List of peptides obtained by shot-gun proteomic analysis from FLO2-MF (#1) seeds.

Score	Acc. No	Description
1119	Os05g33570	pyruvate, phosphate dikinase, chloroplast precursor
669	Os06g51084	1,4-alpha-glucan-branching enzyme, chloroplast precursor
388	Os01g44220	glucose-1-phosphate adenylyltransferase large subunit, chloroplast precursor
384	Os02g32660	1,4-alpha-glucan-branching enzyme, chloroplast precursor
381	Os01g55690	glutelin
373	Os03g46100	FLO2-interacting cupin domain protein 1
370	Os01g67860	fructose-bisphosphate aldolase isozyme
358	Os08g25734	glucose-1-phosphate adenylyltransferase large subunit
324	Os02g38920	glyceraldehyde-3-phosphate dehydrogenase
314	Os12g14070	DnaK family protein
251	Os02g10800	mitochondrial carrier protein
237	Os05g41970	SSA1 - 2S albumin seed storage family protein precursor
234	Os10g08550	enolase
220	Os07g11380	RAL4 - Seed allergenic protein RA5/RA14/RA17 precursor
190	Os03g08010	elongation factor Tu
170	Os11g09280	OsPDIL1-1 protein disulfide isomerase PDIL1-1
161	Os10g33800	lactate/malate dehydrogenase
157	Os10g25130	aminotransferase, classes I and II, domain containing protein
149	Os02g07260	phosphoglycerate kinase protein
145	Os04g08270	pullulanase precursor
129	Os03g49190	oleosin
126	Os02g02410	DnaK family protein
114	Os07g42490	sucrose synthase
96	Os07g11630	LTPL163 - Protease inhibitor/seed storage/LTP family protein precursor
85	Os06g02380	T-complex protein
82	Os08g43190	dehydrogenase
78	Os07g30970	nucleoside diphosphate kinase
73	Os03g31090	40S ribosomal protein S19
72	Os10g41410	nucleoside diphosphate kinase
69	Os07g11410	RAL5 - Seed allergenic protein RA5/RA14/RA17 precursor
69	Os12g07180	transposon protein
69	Os04g55230	FLO2
67	Os07g41820	stress responsive A/B Barrel domain containing protein
67	Os03g55090	alpha-glucan phosphorylase isozyme
66	Os04g46200	oleosin
65	Os07g11330	RAL2 - Seed allergenic protein RA5/RA14/RA17 precursor
60	Os01g64630	actin
60	Os11g02389	protease inhibitor/seed storage/LTP family
58	Os05g49200	aspartic proteinase oryzasin-1 precursor
54	Os02g32030	elongation factor
53	Os02g06700	ribosomal protein
52	Os05g02530	glutathione S-transferase, N-terminal domain containing protein
52	Os03g18220	pyruvate decarboxylase isozyme 2
51	Os02g02890	peptidyl-prolyl cis-trans isomerase
49	Os12g42876	5-methyltetrahydropteroyltriglutamate-homocysteine methyltransferase

Detected peptides are indicated the name of the gene, in which the corresponding region are encoded. The predicted protein name are also shown. #1 and #2 are plant lines that are independently analyzed. Unique proteins in FLO2-MF are shown by red-colored letters.

Supplementary Table S3. List of peptides obtained by shot-gun proteomic analysis from FLO2-MF (#2) seeds.

Score	Acc. No	Description
877	Os05g33570	pyruvate, phosphate dikinase, chloroplast precursor
610	Os06g51084	1,4-alpha-glucan-branching enzyme, chloroplast precursor
519	Os04g55230	FLO2
463	Os02g38920	glyceraldehyde-3-phosphate dehydrogenase
378	Os03g46100	FLO2-interacting cupin domain protein 1
305	Os08g25734	glucose-1-phosphate adenylyltransferase large subunit, chloroplast precursor
305	Os01g67860	fructose-bisphosphate aldolase isozyme
292	Os02g32660	1,4-alpha-glucan-branching enzyme, chloroplast precursor
291	Os01g44220	glucose-1-phosphate adenylyltransferase large subunit, chloroplast precursor
190	Os12g14070	DnaK family protein
181	Os03g08010	elongation factor Tu
181	Os01g55690	glutelin
172	Os02g10800	mitochondrial carrier protein
171	Os07g11380	RAL4 - Seed allergenic protein RA5/RA14/RA17 precursor
166	Os05g41970	SSA1 - 2S albumin seed storage family protein precursor
155	Os02g16820	glutelin
139	Os10g33800	lactate/malate dehydrogenase
130	Os02g15169	glutelin
106	Os01g46070	lactate/malate dehydrogenase
105	Os03g49190	oleosin
98	Os07g11510	RAL6 - Seed allergenic protein RA5/RA14/RA17 precursor
97	Os10g25130	aminotransferase, classes I and II, domain containing protein
96	Os07g11330	RAL2 - Seed allergenic protein RA5/RA14/RA17 precursor
95	Os03g57960	cupin domain containing protein
89	Os08g43190	dehydrogenase
82	Os03g31090	40S ribosomal protein S19
80	Os02g02410	DnaK family protein
70	Os02g07260	phosphoglycerate kinase protein
67	Os12g38000	60S ribosomal protein L8
64	Os07g11360	RAL3 - Seed allergenic protein RA5/RA14/RA17 precursor
61	Os04g08270	pullulanase precursor
59	Os05g49880	lactate/malate dehydrogenase
58	Os06g02380	T-complex protein
57	Os12g06660	actin
54	Os03g64210	T-complex protein
53	Os11g09280	OsPDIL1-1 protein disulfide isomerase PDIL1-1
52	Os12g07180	transposon protein
46	Os10g41410	nucleoside diphosphate kinase
45	Os04g46200	oleosin
41	Os07g44430	peroxiredoxin
39	Os11g02389	protease inhibitor/seed storage/LTP family
38	Os03g58430	40S ribosomal protein S15
38	Os07g11630	LTPL163 - Protease inhibitor/seed storage/LTP family protein precursor
37	Os04g44470	KUN1 - Kunitz-type trypsin inhibitor precursor

Detected peptides are indicated the name of the gene, in which the corresponding region are encoded. The predicted protein name are also shown. #1 and #2 are plant lines that are independently analyzed. Unique proteins in FLO2-MF are shown by red-colored letters.