

### Supplementary File 3

Cases of RNA-editing in expressed rubber tree mitochondrial genes were identified by mapping RNA-seq data from six varieties of rubber tree against the rubber tree master circle mitochondrial genome. There were 224 instances where the RNA-seq reads had a T and the genomic sequence had a C were considered as RNA-edited events. RNA-editing was also predicted using PREP-Mt which predicted 184 (82%) of the above editing sites (table S3.1).

**Table S3.1:** RNA-editing sites, effect and state in each of six rubber tree varieties

Position	Gene	Ref	Var	Editing site	BPM 24	RRIM 600	RRII 105	RRIC 110	RRIT 235	PB 251	predicted
12778	shd3	C	T	shd3eU67PS	C/T	T	T	NA	T	NA	yes
12785	shd3	C	T	shd3eU74SF	C/T	T	NA	T	C/T	NA	yes
12801	shd3	G	A	shd3eU90	G	NA	NA	A	A	A	no
12915	shd3	C	T	shd3eU204	C/T	NA	C/T	C/T	C/T	C/T	no
12995	shd3	C	T	shd3eU284	C	T	T	T	T	T	no
13213	nad4L	C	T	nad4LeU8PL	C/T	C	C/T	C/T	C/T	C	yes
13246	nad4L	C	T	nad4LeU41SF	T	C	C/T	NA	T	NA	yes
13402	nad4L	C	T	nad4LeU197PL	C/T	C	C/T	C/T	T	NA	yes
13756	atp4	C	T	atp4eU59SF	NA	NA	T	C/T	T	NA	no
13786	atp4	C	T	atp4eU89SL	T	T	NA	T	C/T	T	yes
13815	atp4	C	T	atp4eU118RC	T	T	NA	T	T	T	yes
13912	atp4	C	T	atp4eU215SL	T	NA	T	T	T	T	yes
14079	atp4	C	T	atp4eU382	C	C	C/T	C/T	C	C/T	no
14092	atp4	C	T	atp4eU395SL	T	C	T	T	T	T	yes
14113	atp4	C	T	atp4eU416TI	T	NA	T	T	T	C/T	yes
15940	ccmC	C	T	ccmCeU5SF	C/T	T	T	T	T	NA	no
16114	ccmC	C	T	ccmCeU179AV	T	NA	C/T	T	T	NA	yes

16119	ccmC	C	T	ccmCeU184RW	T	NA	C/T	T	T	NA	yes
16187	ccmC	C	T	ccmCeU252	C	NA	C/T	C/T	C/T	NA	no
16216	ccmC	C	T	ccmCeU281TI	NA	NA	T	T	T	T	no
26812	nad7_exon5	G	A	nad7eU1137	A	NA	G/A	G/A	G/A	G/A	no
26825	nad7_exon5	G	A	nad7eU1124PL	A	NA	A	G/A	A	G/A	yes
26892	nad7_exon5	G	A	nad7eU1057RC	A	NA	A	NA	A	A	yes
26899	nad7_exon5	G	A	nad7eU1050	A	NA	A	A	A	A	no
26986	nad7_exon5	G	A	nad7eU963	A	NA	G/A	G/A	G/A	G	no
28881	nad7_exon4	G	A	nad7eU836PL	A	G/A	A	A	A	A	yes
30187	nad7_exon3	G	A	nad7eU578SL	A	A	A	A	A	G/A	no
30300	nad7_exon3	G	A	nad7eU465	G/A	NA	G/A	G	G/A	G	no
30382	nad7_exon3	G	A	nad7eU383SL	A	NA	A	A	A	G/A	yes
30541	nad7_exon3	G	A	nad7eU224TM	NA	G/A	A	A	A	G	yes
30561	nad7_exon2	G	A	nad7eU200SF	A	A	A	G/A	G/A	A	yes
33183	nad7_exon1	G	A	nad7eU38SL	A	A	A	A	A	NA	yes
83148	cob	G	A	cobeU1124PL	A	NA	A	A	A	A	yes
83188	cob	G	A	cobeU1084PS	A	NA	A	A	A	A	yes
83290	cob	G	A	cobeU982HY	G/A	NA	A	A	G/A	A	yes
83419	cob	G	A	cobeU853HY	G/A	A	A	A	A	A	yes
83464	cob	G	A	cobeU808PS	A	A	A	A	G/A	A	yes
83704	cob	G	A	cobeU568HY	G/A	NA	A	A	A	G/A	yes
83914	cob	G	A	cobeU358RW	A	NA	A	A	A	A	yes
83947	cob	G	A	cobeU325HY	A	NA	NA	NA	A	G/A	yes
83986	cob	G	A	cobeU286LF	A	A	A	A	A	A	yes
84094	cob	G	A	cobeU178HY	A	NA	A	A	A	A	yes
84154	cob	G	A	cobeU118PS	A	NA	A	A	A	A	yes
85930	rpl5	G	A	rpl5eU518PL	G/A	NA	A	A	A	NA	yes
85933	rpl5	G	A	rpl5eU515PL	G/A	NA	A	A	A	NA	yes

86116	rpl5	G	A	rpl5eU332SL	A	NA	A	A	A	G/A	no
86181	rpl5	G	A	rpl5eU267	G/A	NA	G/A	A	G/A	G/A	no
86282	rpl5	G	A	rpl5eU166PS	G/A	NA	A	A	A	A	no
98491	nad1_exon1	G	A	nad1eU265RW	A	NA	A	G/A	A	NA	yes
98541	nad1_exon1	G	A	nad1eU215SF	A	NA	A	A	A	A	yes
98589	nad1_exon1	G	A	nad1eU167SL	A	NA	A	NA	A	A	yes
98716	nad1_exon1	G	A	nad1eU40	G/A	NA	G/A	G/A	G/A	G	yes
98754	nad1_exon1	G	A	nad1eU2TM	G/A	NA	G/A	G/A	G/A	G/A	yes
123509	nad2_exon5	G	A	nad2eU1400SL	A	A	G/A	G/A	G/A	G/A	yes
125277	nad2_exon4	G	A	nad2eU1127SL	A	NA	A	G/A	G/A	A	yes
125476	nad2_exon4	G	A	nad2eU928HY	A	NA	G/A	G/A	NA	NA	yes
125484	nad2_exon4	G	A	nad2eU920PL	A	NA	G/A	G/A	NA	NA	yes
125595	nad2_exon4	G	A	nad2eU809SF	A	NA	A	A	A	A	yes
125604	nad2_exon4	G	A	nad2eU800SL	A	NA	A	A	A	A	yes
128281	nad2_exon3	G	A	nad2eU662SF	G	NA	A	G/A	G/A	G	yes
128334	nad2_exon3	G	A	nad2eU609	G	NA	G	G/A	A	G	yes
148471	nad9	C	T	nad9eU92SF	T	NA	C	T	T	T	yes
148546	nad9	C	T	nad9eU167SL	T	NA	C/T	C/T	C/T	T	yes
148569	nad9	C	T	nad9eU190HY	T	NA	C/T	C/T	C/T	C/T	yes
148677	nad9	C	T	nad9eU298PS	T	NA	C/T	C/T	T	C/T	yes
148707	nad9	C	T	nad9eU328RW	T	NA	C/T	T	T	T	yes
162758	rps1	G	A	rps1eU781	G/A	G/A	G/A	G/A	G/A	NA	no
163327	rps1	G	A	rps1eU212PS	A	NA	A	A	A	G/A	no
174030	ccmFn	C	T	ccmFneU38PL	T	NA	T	NA	T	NA	yes
174357	ccmFn	C	T	ccmFneU365SL	T	NA	C	T	C/T	NA	yes
174944	ccmFn	C	T	ccmFneU952RC	T	T	C/T	NA	T	NA	yes
181673	nad5_exon4	G	A	nad5eU1610PL	A	NA	A	A	A	A	yes
181694	nad5_exon4	G	A	nad5eU1589SF	A	NA	G/A	NA	NA	A	yes

181733	nad5_exon4	G	A	nad5eU1550TI	G/A	G/A	G/A	G/A	G/A	A	yes
181793	nad5_exon4	G	A	nad5eU1490PL	A	NA	A	A	A	NA	yes
221616	cox1_exon1	C	T	cox1eU15	C/T	T	T	C/T	C/T	C/T	no
221843	cox1_exon1	C	T	cox1eU242SF	T	NA	T	T	C/T	T	yes
221855	cox1_exon1	C	T	cox1eU254SF	T	NA	T	T	C/T	C/T	yes
221944	cox1_exon1	C	T	cox1eU343	NA	C/T	C	NA	NA	C	no
222044	cox1_exon1	C	T	cox1eU443SL	T	NA	T	T	C/T	T	yes
222053	cox1_exon1	C	T	cox1eU452SF	T	NA	T	T	T	T	yes
222116	cox1_exon1	C	T	cox1eU515SF	T	NA	T	T	T	T	yes
222152	cox1_exon1	C	T	cox1eU551SL	T	T	T	T	T	T	yes
222191	cox1_exon1	C	T	cox1eU590PL	T	T	T	T	T	T	yes
223329	cox1_exon2	C	T	cox1eU761SF	T	NA	T	T	T	T	yes
223606	cox1_exon2	C	T	cox1eU1038	C/T	T	C/T	C/T	C/T	C/T	no
223647	cox1_exon2	C	T	cox1eU1079PL	T	T	T	T	T	T	yes
223754	cox1_exon2	C	T	cox1eU1186HY	T	T	T	T	C/T	T	yes
223842	cox1_exon2	C	T	cox1eU1274PL	T	T	T	T	T	C/T	yes
223855	cox1_exon2	C	T	cox1eU1287	C/T	NA	C/T	C/T	C/T	T	no
223957	cox1_exon2	C	T	cox1eU1389	C	C	C/T	C/T	C/T	C/T	no
223970	cox1_exon2	C	T	cox1eU1402RC	C/T	T	T	T	NA	T	yes
223973	cox1_exon2	C	T	cox1eU1405RC	C/T	T	T	NA	NA	T	yes
224001	cox1_exon2	C	T	cox1eU1433SL	T	T	T	T	T	T	yes
224057	cox1_exon2	C	T	cox1eU1489PS	T	NA	T	T	T	T	yes
229015	nad5_exon2	G	A	nad5eU1310SL	A	NA	A	A	A	A	yes
229600	nad5_exon2	G	A	nad5eU725SL	G/A	NA	A	A	A	A	yes
229612	nad5_exon2	G	A	nad5eU713SL	G/A	A	A	G/A	A	A	yes
229786	nad5_exon2	G	A	nad5eU539PL	A	NA	NA	A	A	NA	yes
229927	nad5_exon2	G	A	nad5eU398SF	A	NA	A	G/A	A	A	yes
229951	nad5_exon2	G	A	nad5eU374PL	A	NA	A	A	A	A	yes

231013	nad5_exon1	G	A	nad5eU155RW	G/A	A	G/A	A	G/A	G/A	yes
352739	MatR	C	T	matReU32SF	T	NA	T	T	T	T	yes
353033	MatR	C	T	matReU326QL	C/T	T	T	T	T	NA	yes
354252	MatR	C	T	matReU1545	C/T	NA	C/T	C/T	C/T	C/T	no
354463	MatR	C	T	matReU1756PS	C	T	C/T	C/T	T	C/T	yes
354533	MatR	C	T	matReU1826PL	C/T	T	C/T	T	C/T	C/T	yes
354551	MatR	C	T	matReU1844SL	T	NA	T	T	T	C/T	yes
355592	nad1_exon5	C	T	nad1eU823LF	T	C	C/T	C/T	C/T	C/T	yes
355667	nad1_exon5	C	T	nad1eU898RW	T	NA	A	C/T	C/T	T	yes
355697	nad1_exon5	C	T	nad1eU928RW	T	NA	C/T	C/T	C/T	T	yes
355706	nad1_exon5	C	T	nad1eU937PS	T	C	C/T	C/T	C/T	T	yes
450681	nad1_exon3	G	A	nad1eU635SL	G/A	NA	G	A	G	NA	yes
450743	nad1_exon3	G	A	nad1eU573	A	NA	G	A	G/A	NA	no
546014	ccmFc_exon2	G	A	ccmFceU1315R*	A	NA	G/A	A	A	A	yes
546061	ccmFc_exon2	G	A	ccmFceU1268SL	A	NA	G/A	A	A	A	no
546451	ccmFc_exon2	G	A	ccmFceU878SF	A	A	NA	A	A	A	yes
547881	ccmFc_exon1	G	A	ccmFceU406RC	G/A	G/A	A	G/A	G/A	G/A	yes
547977	ccmFc_exon1	G	A	ccmFceU310RC	A	A	A	A	A	A	no
584511	rpl10	G	A	rpl10eU397LF	G	NA	A	NA	G/A	A	no
584578	rpl10	G	A	rpl10eU330	G	NA	A	NA	G/A	A	no
584594	rpl10	G	A	rpl10eU314SL	G	NA	A	NA	A	A	yes
584899	rpl10	G	A	rpl10eU9	NA	NA	G/A	NA	A	A	no
589445	nad6	G	A	nad6eU463PS	G/A	NA	A	A	A	A	no
589747	nad6	G	A	nad6eU161PL	G/A	NA	A	A	G/A	A	yes
589762	nad6	G	A	nad6eU146SF	G/A	NA	A	A	A	A	yes
589882	nad6	G	A	nad6eU26PL	A	NA	G/A	A	A	NA	no
590588	rps4	G	A	rps4eU1027RW	G/A	A	NA	NA	NA	A	yes
590593	rps4	G	A	rps4eU1022PL	G/A	A	NA	NA	NA	A	yes

590689	rps4	G	A	rps4eU926SL	A	NA	NA	NA	G/A	A	yes
591121	rps4	G	A	rps4eU494SL	A	NA	NA	NA	A	A	yes
591439	rps4	G	A	rps4eU176SL	A	NA	NA	A	G/A	G	yes
591470	rps4	G	A	rps4eU145PS	G/A	NA	NA	A	A	A	yes
591554	rps4	G	A	rps4eU61RW	G/A	G	A	A	G/A	A	yes
624907	nad2_exon1	C	T	nad2eU26SF	T	NA	T	T	T	NA	yes
624937	nad2_exon1	C	T	nad2eU56SF	C/T	NA	C/T	T	C	NA	yes
624951	nad2_exon2	C	T	nad2eU70LF	T	NA	T	C/T	T	C/T	no
626482	nad2_exon2	C	T	nad2eU344PL	T	NA	T	T	T	T	no
664637	nad4_exon1	C	T	nad4eU29SF	T	NA	C/T	T	C	T	yes
664652	nad4_exon1	C	T	nad4eU44PL	T	NA	C/T	T	C	T	yes
664925	nad4_exon1	C	T	nad4eU317SL	C/T	NA	C/T	T	T	T	yes
666645	nad4_exon2	C	T	nad4eU608SL	T	NA	T	T	C/T	T	yes
666696	nad4_exon2	C	T	nad4eU659SF	T	NA	T	T	T	T	yes
666804	nad4_exon2	C	T	nad4eU767PL	T	NA	T	T	T	T	yes
670444	nad4_exon3	C	T	nad4eU1010PL	T	NA	T	C/T	T	NA	yes
670535	nad4_exon3	C	T	nad4eU1101	C	NA	C/T	C	C/T	C/T	no
670563	nad4_exon3	C	T	nad4eU1129LF	T	NA	T	T	T	C/T	yes
670606	nad4_exon3	C	T	nad4eU1172SL	T	NA	T	NA	NA	NA	yes
670645	nad4_exon3	C	T	nad4eU1211SL	C/T	NA	T	T	NA	NA	yes
670789	nad4_exon3	C	T	nad4eU1355SL	T	NA	T	T	T	T	yes
673519	nad4_exon4	C	T	nad4eU1417HY	T	C/T	C/T	T	C/T	C/T	yes
673535	nad4_exon4	C	T	nad4eU1433PL	C/T	C	C/T	C/T	C/T	C/T	yes
697141	atp6	C	T	atp6eU37PS	T	C	T	T	C/T	T	yes
697220	atp6	C	T	atp6eU116SL	C/T	NA	C/T	G/A	C/T	T	yes
697271	atp6	C	T	atp6eU167PL	C/T	NA	A	G/A	C/T	T	yes
697277	atp6	C	T	atp6eU173PL	C/T	NA	C/T	T	C/T	T	yes
697505	atp6	C	T	atp6eU401SL	C/T	T	T	T	C/T	T	yes

697564	atp6	C	T	atp6eU460PS	C/T	NA	C/T	C/T	C/T	T	yes
697567	atp6	C	T	atp6eU463HY	T	NA	C/T	C/T	C/T	NA	yes
697589	atp6	C	T	atp6eU485SL	T	NA	C/T	C/T	C/T	T	yes
697631	atp6	C	T	atp6eU527SL	T	NA	C/T	C/T	C/T	T	yes
697703	atp6	C	T	atp6eU599PL	C/T	NA	C/T	NA	T	T	yes
697768	atp6	C	T	atp6eU664HY	C/T	NA	T	T	C/T	NA	yes
697775	atp6	C	T	atp6eU671SF	C/T	NA	T	T	T	NA	yes
713794	cox2_exon1	C	T	cox2eU27	C/T	T	C/T	C/T	C/T	C/T	no
713838	cox2_exon1	C	T	cox2eU71SF	C/T	T	C/T	C/T	T	T	yes
713923	cox2_exon1	C	T	cox2eU156	C/T	T	C/T	C/T	C/T	C/T	no
713930	cox2_exon1	C	T	cox2eU163RW	T	T	C/T	T	T	T	yes
714020	cox2_exon1	C	T	cox2eU253RW	C/T	T	C/T	T	T	T	yes
714045	cox2_exon1	C	T	cox2eU278PL	C/T	T	T	T	T	T	yes
714146	cox2_exon1	C	T	cox2eU379RW	T	T	T	T	C/T	T	yes
714210	cox2_exon1	C	T	cox2eU443TM	T	C/T	C/T	T	C/T	T	yes
714243	cox2_exon1	C	T	cox2eU476SL	T	C/T	C/T	T	T	T	yes
714324	cox2_exon1	C	T	cox2eU557PL	T	T	T	T	T	T	yes
714348	cox2_exon1	C	T	cox2eU581SL	T	NA	T	T	T	G/A	yes
714399	cox2_exon1	C	T	cox2eU632SL	T	C	C/T	C/T	C/T	C/T	yes
714465	cox2_exon1	C	T	cox2eU698TM	T	T	T	T	T	T	yes
716543	cox2_exon2	C	T	cox2eU721PS	C/T	NA	C/T	C/T	C/T	C/T	yes
716564	cox2_exon2	C	T	cox2eU742RW	C/T	NA	C/T	C/T	C/T	C/T	yes
717741	mttB	C	T	mttBeU262HY	C/T	NA	NA	NA	C/T	T	yes
742834	ccmB	C	T	ccmBeU424RC	C/T	NA	C	C	C/T	NA	yes
743006	ccmB	C	T	ccmBeU596SL	C/T	NA	T	NA	C/T	NA	yes
761183	atp9	C	T	ccmBeU223RX	T	T	T	T	T	T	yes
854178	atp9	C	T	atp9eU20SL	T	C	T	C/T	C/T	T	yes
882681	atp8	C	T	atp8eU458PL	T	T	T	T	T	T	yes

883993	cox3	C	T	cox3eU245PL	T	NA	T	T	T	T	yes
884011	cox3	C	T	cox3eU263PL	T	NA	T	T	T	T	yes
884037	cox3	C	T	cox3eU289LF	NA	NA	T	NA	C/T	T	yes
884059	cox3	C	T	cox3eU311SF	NA	NA	T	NA	C/T	T	yes
884136	cox3	C	T	cox3eU388RW	T	T	T	T	C/T	T	yes
884161	cox3	C	T	cox3eU413PL	T	T	T	T	A	T	yes
884260	cox3	C	T	cox3eU512SL	C/T	T	C/T	C/T	C/T	T	yes
884502	sdh4	C	T	sdh4eU29SL	A	NA	T	C/T	T	T	no
884512	sdh4	C	T	sdh4eU39	C/T	NA	C/T	C/T	T	T	no
884826	sdh4	C	T	sdh4eU353SF	C/T	NA	C/T	T	C/T	C/T	yes
1031134	rps12	G	A	rps12eU284SF	G/A	NA	G/A	G/A	G/A	G/A	yes
1031149	rps12	G	A	rps12eU269SL	G/A	NA	G/A	G/A	A	A	yes
1031222	rps12	G	A	rps12eU196HY	A	A	A	G/A	A	G/A	yes
1031272	rps12	G	A	rps12eU146PL	A	A	A	G/A	G/A	A	yes
1031318	rps12	G	A	rps12eU100RC	G/A	G/A	A	G/A	G/A	G/A	yes
1031347	rps12	G	A	rps12eU71SL	A	A	G/A	G/A	G/A	G/A	yes
1031615	nad3	G	A	nad3eU208LF	A	A	G/A	G/A	A	A	yes
1031677	nad3	G	A	nad3eU146SF	A	NA	A	A	A	A	yes
1031743	nad3	G	A	nad3eU80PL	A	NA	A	A	NA	G/A	yes
1031751	nad3	G	A	nad3eU344SL	A	NA	G/A	G/A	A	G/A	yes
1031756	nad3	G	A	nad3eU349RW	A	NA	G/A	G/A	A	G/A	yes
1031818	nad3	G	A	nad3eU5SL	A	NA	G/A	G/A	G/A	G/A	yes
1046524	rpl16	G	A	nad3eU407SL	G/A	G	A	G/A	G/A	A	yes
1046530	rpl16	G	A	nad3eU401PL	A	G/A	A	G/A	A	A	yes
1046596	rpl16	G	A	rpl16eU335PL	G/A	G/A	A	A	G/A	G/A	yes
1046699	rpl16	G	A	rpl16eU232LF	G/A	A	G/A	G/A	G/A	G/A	yes
1046827	rpl16	G	A	rpl16eU104TI	G/A	G/A	A	G/A	G/A	G/A	yes
1046975	rps3	G	A	rps3eU1619SL	G/A	G/A	G/A	G/A	G/A	G/A	yes



1047006	rps3	G	A	rps3eU1588PS	G/A	A	G/A	G/A	G/A	G/A	G/A	no
1047039	rps3	G	A	rps3eU1555RC	G/A	A	G/A	G/A	G/A	G/A	G/A	yes
1047563	rps3	G	A	rps3eU1031PL	G/A	NA	G/A	G/A	G/A	G/A	G/A	yes
1047704	rps3	G	A	rps3eU890SL	G/A	NA	G/A	G/A	G/A	G/A	G/A	no
1047881	rps3	G	A	rps3eU713SL	G/A	G/A	G/A	G/A	G/A	G/A	G/A	yes
1048502	rps3	G	A	rps3eU92SL	A	G/A	G/A	G/A	G/A	G/A	G/A	yes
1168653	atp1	C	T	atp1eU1039PS	T	T	T	T	T	T	T	yes
1168792	atp1	C	T	atp1eU1178SL	T	T	T	T	C/T	T	T	yes
1168830	atp1	C	T	atp1eU1216LF	T	T	T	C/T	C/T	T	T	yes
1168906	atp1	C	T	atp1eU1292PL	C/T	NA	T	T	T	T	T	yes
1169029	atp1	C	T	atp1eU1415PL	T	T	T	T	T	T	T	yes
1169104	atp1	C	T	atp1eU1490PL	T	NA	T	C	T	T	T	yes

## RNA-editing comparison

We obtained RNA-editing information from genbank for all plant species where RNA-editing information was available for all rubber tree genes with sufficient RNA-seq depth to identify RNA-editing events. Some species had RNA-editing information available for all of their mitochondrial genes, but many species only had information available for some genes. We converted the RNA-edited C into a U for all species including the six rubber tree varieties and then aligned the resulting sequence to identify sites of RNA-editing that were conserved or novel. Cases where the sequence depth for individual rubber tree varieties was insufficient at RNA-edited sites have an 'N' instead of a C or U call. There were many cases where rubber tree appears to lack an RNA-editing site, however this was largely due to low or no coverage in all of the varieties at that particular site, this is most noticeable in *nad4* and *nad7*.

### atp1 multiple sequence alignment

```
Lotus japonicus -----GAAGATCAGAACGAAATTACTTA
BPM24_atp1 -----
Millettia pinnata -----GTCTGGGCGAACTTCAAGA
RRIM600_atp1 -----
Arabidopsis thaliana -----GAGTCCCGCCTCGAAGAAAGAA
Brassica napus -----GGGTATAAATATACCT-AAAGTTTTAA
RRII105_atp1 -----
Beta macrocarpa ATTACCCCCGGAATGGACCATGCCTGACCTTGTTCCGGACAGTGCTTGGGG
Beta vulgaris vulgaris ATTACCCCCGGAATGGACCATGCCTGACCTTGTTCCGGACAGTGCTTGGGG
Beta vulgaris maritima ATTACCCCCGGAATGGACCATGCCTGACCTTGTTCCGGACAGTGCTTGGGG
Silene latifolia -----AGGATTGGGGATGAGG
PB235_atp1 -----
RRIT251_atp1 -----
Citrullus lanatus -----TGGTCTATCCAAGAATTTTCCCGTACGGTGATTGGGG
Cucurbita pepo -----CCGGGTAGGGGCTGGC-TATTGGACGGGG
RRIC110_atp1 -----
Oryza sativa Japonica -----TTCGCATAAATGAAAAAA
Cycas taitungensis -----GGTCCAATTCAATTATGCACCACCCCTTTAGCG
Anomodon rugelii -----
Anomodon attenuatus -----
Megaceros aenigmaticus -----
Phaeoceros laevis -----

Lotus japonicus GAGTAATCTTTTATTT-TTCATCCCGAACTAGACAGACAGAGCTTCATAC
BPM24_atp1 -----
Millettia pinnata ATGGAAGGATTCACT---AAGGCAAAACTCCCAACATTACAAATCCATT
RRIM600_atp1 -----
Arabidopsis thaliana GGTTCAGTCTCATTCAACCAACTCTTTTTTGAAGCAGATAGTTCACGA
Brassica napus ATCTTTTTTTTTTATT--ATTGTTGATACTCCTGCAGAGAATCTCTTAGGA
RRII105_atp1 -----
Beta macrocarpa ATGAAGCTCTTCAGC-AG--GGCTTTCTGACGGATGCCTACTATGATGT
Beta vulgaris vulgaris ATGAAGCTCTTCAGC-AG--GGCTTTCTGACGGATGCCTACTATGATGT
```

Beta vulgaris maritima ATGAAGCTCTTCAGC-AG---GGCTTTCTGACGGATGCCTACTATGATGT  
Silene latifolia ATGACGCTCTTCAGC-AC---GTCTTTCTCAAGGATGCCTACTATGATCT  
PB235\_atp1 -----  
RRIT251\_atp1 -----  
Citrullus lanatus AAGAGGTGGTTCAAG-ACCCCTTATCTAAGCGACGTCTTGCCGATCT  
Cucurbita pepo CCCGGGTTAT-CAAG-GCTCAAAATGGCAAG--GACTTCTCATTGAGCAG  
RRIC110\_atp1 -----  
Oryza sativa Japonica AAAGCGAGATGTGCACGAAAGAAGATCATAGTTCAGCTTTAAAATGGTGG  
Cycas taitungensis GAGAGGGTAAGCGGA-AGCAAGACAAATGGTCATAGAAGCAATCTAATAG  
Anomodon rugelii -----  
Anomodon attenuatus -----  
Megaceros aenigmaticus -----  
Phaeoceros laevis -----

Lotus japonicus GGTGCTTTTCATAAGTTCGAGTCT-TCCTGTCTGGTTTGATTCTACCTGT  
BPM24\_atp1 -----  
Milletia pinnata TTTGGCTTCTATAAGCCCGGGGGGTCTTTTATGAAGGGAATACTCCT-T  
RRIM600\_atp1 -----  
Arabidopsis thaliana GATAAT-TGAGTAAGTTAAGATAGATGTAACAATTTGAACCAAAGGCCTT  
Brassica napus GCGAACGCGATCTATTTAGACCTGATCTATCAGG--GCACGAATAGTCGC  
RRII105\_atp1 -----  
Beta macrocarpa GATGTTATGTGGCACTCATAGTTGGGGATGCGAGGAGCTCCTGAATTTGC  
Beta vulgaris vulgaris GATGTTATGTGGCACTCATAGTTGGGGATGCGAGGAGCTCCTGAATTTGC  
Beta vulgaris maritima GATGTTATGTGGCACTCATAGTTGGGGATGCGAGGAGCTCCTGAATTTGC  
Silene latifolia TATGTTATGTGGCACTCGTAGTTGGTTATGCGACGAGGTTTTTAAGTTTT  
PB235\_atp1 -----  
RRIT251\_atp1 -----  
Citrullus lanatus TTCACTTCATGGTTTGCAGAGTTGGTATTGGGAGGAAGCTGTGAAGCTTC  
Cucurbita pepo GCTCAATGCTATCTTTCACAGTCAAGAGAACAACGAGG--GCCGCGCTCC  
RRIC110\_atp1 -----  
Oryza sativa Japonica TGTCCCTGTGTTAGTAAGTGGTTGAAATAGCTCATGGGAGTGTCTGCCCC  
Cycas taitungensis TATAGAGCCTAATTATGGCATTTAGTCTTTATTAGATCCGGTTCGCCCTT  
Anomodon rugelii -----  
Anomodon attenuatus -----  
Megaceros aenigmaticus -----  
Phaeoceros laevis -----

Lotus japonicus TCGATCAAAGGACAAG--CCTCTCTTTTTCAATTCTTCCAACCCCTG  
BPM24\_atp1 -----  
Milletia pinnata ATGGTTATAGGACGTA--CTAGTTGCTCGATCAGGACCCTAGCTTTATTG  
RRIM600\_atp1 -----  
Arabidopsis thaliana TTTAGTGATTAGTCTG--CTAGTT--TCTTTGATCTTAGTCGGTGTAAT  
Brassica napus TACTTTGCCCAAGCT---CTGGAG--TTAGTGCTTTCGTTCAAGTTATAA  
RRII105\_atp1 -----  
Beta macrocarpa TGGATCTAAT-----CAACTAT-----TCTTGATCTGGGCGGG-  
Beta vulgaris vulgaris TGGATCTAAT-----CAACTAT-----TCTTGATCTGGGCGGG-  
Beta vulgaris maritima TGGATCTAAT-----CAACTAT-----TCTTGATCTGGGCGGG-  
Silene latifolia TGGATCTAAT-----CAGCTATAACCTATGTCTTTCTTTGGAAAGAG  
PB235\_atp1 -----  
RRIT251\_atp1 -----  
Citrullus lanatus TAACTAGAATTACCAGCTCGGTAATGTGAAAGAGAACATCTTAGTCTTTA  
Cucurbita pepo TACTTTCACTTTCACTCTTCTTTCTAAAGAAGCCCGCTCTTGCTTGA  
RRIC110\_atp1 -----  
Oryza sativa Japonica ATTCGATAATGGCATTATGATCTAGTGGAGTGAGTGATTGTGTGGTGT  
Cycas taitungensis TCAAATGAATGA----ATGAATCGAAGAAGCAGCTGTTTCATTCCATTC  
Anomodon rugelii -----  
Anomodon attenuatus -----  
Megaceros aenigmaticus -----  
Phaeoceros laevis -----

Lotus japonicus  
BPM24\_atp1  
Millettia pinnata  
RRIM600\_atp1  
Arabidopsis thaliana  
Brassica napus  
RRII105\_atp1  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
Silene latifolia  
PB235\_atp1  
RRIT251\_atp1  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_atp1  
Oryza sativa Japonica  
Cycas taitungensis  
Anomodon rugelii  
Anomodon attenuatus  
Megaceros aenigmaticus  
Phaeoceros laevis

GGGTCTT----CTTTTGTTTTGCGGTATTCCCCC-----ACGAGGTCAA  
-----  
CGAGCCAAAAACCTTTTGTTTGCGGCATTCCCCCTGTTATAGAAGGTAA  
-----  
TATTCCTTTTTTTTTCTAAAGCGGTATTCTCCTTGCCTCTTAATTA  
GGTTGACTTTTTTTTTCTAAAGCGGTATTCTCCTTGCCTCTGAATTCAA  
-----  
-----ATCTATCAGCAGCGGCATTCTCCCTTA- ACTCT----ATT  
-----ATCTATCAGCAGCGGCATTCTCCCTTA- ACTCT----ATT  
-----ATCTATCAGCAGCGGCATTCTCCCTTA- ACTCT----ATT  
AACTCTTTTCATTTATCAGCAGCGGCATTCTCCTTATACTCTTTATATT  
-----  
-----CAGCAGCGGCATTCTCCCTTG- ACTCG----AGA  
TCTGGGCGGGATCTATCAGCAGCGGCATTCTCCCTTG- ACTCG----AGA  
-----  
CAGTCTAAGGCTTTTTGAAAAGCGGATTTCTCCCTTCTCTCATCCATCGT  
TATTT-----TCTCGGTAAAGCGGATTTCTCCCTATCCTCCA----TTT  
-----  
-----  
-----  
-----

Lotus japonicus  
BPM24\_atp1  
Millettia pinnata  
RRIM600\_atp1  
Arabidopsis thaliana  
Brassica napus  
RRII105\_atp1  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
Silene latifolia  
PB235\_atp1  
RRIT251\_atp1  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_atp1  
Oryza sativa Japonica  
Cycas taitungensis  
Anomodon rugelii  
Anomodon attenuatus  
Megaceros aenigmaticus  
Phaeoceros laevis

ATGAATGGAATTTGA-----ATTATGGAATTCTCATTAAAGAGCTGCG  
-----ATGGAATTTTCTCCAGAGCTGCG  
AAGAATGGAATAT-----ATTATGGACTTTTCTGTAAGAGCTGCT  
-----ATGGAATTTTCTCCAGAGCTGCG  
A--AATGGAAT-----TATGGAATTATCTCCTAGAGCTGCG  
A--AATGGAAT-----TATGGAATTATCTCUAGAGCTGCG  
-----ATGGAATTTTCTCCAGAGCTGCG  
CTATTTTTGAA-----TCATGGAATTCTCTCCAGAGCTGCG  
CTATTTTTGAA-----TCATGGAATTCTCTCCAGAGCTGCG  
CTATTTTTGAA-----TCATGGAATTCTCTCCAGAGCTGCG  
ATATATTAATAAAAAAAAAAAAAAAAAATTTTATGGAATTCTCTCCAGAGCTGCG  
-----ATGGAATTTTCTCCAGAGCTGCG  
-----ATGGAATTTTCTCCAGAGCTGCG  
CCATTTGAGAA-----TCATGGAATTCTCTCCGGAGCTGCG  
CCATTTTAGAA-----TCATGAAATTCTCTCCGGAGCTGCG  
-----ATGGAATTTTCTCCAGAGCTGCG  
CTTTGTTAAAG-----TATGGAATTCTCACCCAGAGCTGCG  
GTTCCCTTAAGT-----AUGAAATTATACCTGGAGCTGCG  
-----AUGAACAAATTAAGTGGAAATAAGTTGGCTGGAG---CA  
-----AUGAACAAATTAAGTGGAAATAAGTTGGCTGGAG---CA  
-----AUGAACAAATTTGCTGGAA---CG  
-----AUGAACAAATTTGCTGGAA---CG  
\* \* \*\* \*

Lotus japonicus  
BPM24\_atp1  
Millettia pinnata  
RRIM600\_atp1  
Arabidopsis thaliana  
Brassica napus  
RRII105\_atp1  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
Silene latifolia  
PB235\_atp1  
RRIT251\_atp1

GAACTAACAACTCTATTAGAAAGTAGAATTACCAACTTTTACACAAATTT  
GAACTAACAACTCTATTAGAAAGTCGAATTACCAACTATTACACAAATTT  
GAACTUACTACTCTATTAGAAAGTAGAATTACCAACTTTTACACAAATTT  
GAACTAACAACTCTATTAGAAAGTCGAATTACCAACTATTACACAAATTT  
GAACTAACGAATCTATTCGAAAGTCGAATTAGGAACTTTACGCGAATTT  
GAACTAACGAATCTATTCGAAAGTCGAATTAGGAACTTTACGCGAATTT  
GAACTAACAACTCTATTAGAAAGTCGAATTACCAACTATTACACAAATTT  
GAACTAACGAATCTATTAGAAAGTAGAATTACCAACTTTTACACGAATTT  
GAACTAACGAATCTATTAGAAAGTAGAATTACCAACTTTTACACGAATTT  
GAACTAACGAATCTATTAGAAAGTAGAATTACCAACTTTTACACGAATTT  
GAACTAACGAATCTATTAGAAAGTAGAATTACCAACTTTTACACGAATTT  
GAACTAACAACTCTATTAGAAAGTAGAATTAGCAACTTTTATACGAATTT  
GAACTAACAACTCTATTAGAAAGTCGAATTACCAACTATTACACAAATTT  
GAACTAACAACTCTATTAGAAAGTCGAATTACCAACTATTACACAAATTT

















RRIC110\_atp1  
Oryza sativa Japonica  
Cycas taitungensis  
Anomodon rugelii  
Anomodon attenuatus  
Megaceros aenigmaticus  
Phaeoceros laevis

TTAGAAAGAGCCGCTAAACGATCGGACCAGACAGGTGCAGGTAGCTTGAC  
TTAGAAAGAGCCGCTAAACGATCGGACCAGACAGGTGCAGGTAGCTTGAC  
TCAGAAAGAGCCGCTAAACGATCGGACCAGACAGGTGCGGGTAGCTTGAC  
TCAGAAAGAGCCGCTAAAATGTCAGACCAAAGTGGTGCAGGTAGCTTGAC  
TCAGAAAGAGCCGCTAAAATGTCAGACCAAAGTGGTGCAGGTAGCTTGAC  
TCAGAAAGAGCCGCTAAGATGTCAGACCAGACTGGCGCAGGTAGCTTGAC  
TTAGAAAGAGCCGCTAAAATGTCAGACCAGACTGGTGCAGGTAGCTTGAC  
\* \*\*\*\*\* \*\* \*\* \*\* \*\*

Lotus japonicus  
BPM24\_atp1  
Millettia pinnata  
RRIM600\_atp1  
Arabidopsis thaliana  
Brassica napus  
RRII105\_atp1  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
Silene latifolia  
PB235\_atp1  
RRIT251\_atp1  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_atp1  
Oryza sativa Japonica  
Cycas taitungensis  
Anomodon rugelii  
Anomodon attenuatus  
Megaceros aenigmaticus  
Phaeoceros laevis

CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
TGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
CGCCTTACCCGTCATTGAAACACAAGCTGGAGACGTATCGGCCTATATTC  
TGCATTACCTGTAATTGAAACACAAGCTGGAGATGTATCTGCTTATATTC  
TGCATTACCTGTAATTGAAACACAAGCTGGAGATGTATCTGCTTATATTC  
TGCATTACCTGTAATTGAAACACAAGCTGGAGATGTATCTGCTTATATTC  
TGCATTACCTGTAATTGAAACACAAGCTGGAGATGTATCTGCTTATATTC  
\* \*\*\*\* \*\* \*\*\*\*\* \*\* \*\* \*\*

Lotus japonicus  
BPM24\_atp1  
Millettia pinnata  
RRIM600\_atp1  
Arabidopsis thaliana  
Brassica napus  
RRII105\_atp1  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
Silene latifolia  
PB235\_atp1  
RRIT251\_atp1  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_atp1  
Oryza sativa Japonica  
Cycas taitungensis  
Anomodon rugelii  
Anomodon attenuatus  
Megaceros aenigmaticus  
Phaeoceros laevis

CAACCAATGTGATCTCCATTACTGATGGACAAATATGTTTGGAAACAGAG  
CTACCAATGTGATCUCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CCACCAATGTGATCTCAATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CTACCAATGTGATCUCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CCACCAATGTGATCTCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CCACCAATGTGATCTCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CCACCAATGTGATCTCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CCACCAATGTGATCTCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CCACCAATGTGATCTCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CCACCAATGTGATCTCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CTACCAATGTGATCUCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CTACCAATGTGATCUCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CCACCAATGTGATCUCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CCACCAATGTGATCUCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CTACCAATGTGATCTCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CTACCAATGTGATCTCCATTACTGATGGACAAATCTGTTTGGAAACAGAG  
CGACCAATGTTATTTCCATTACTGATGGACAAATCTTTTGGAAACAGAA  
CGACCAATGTTATTTCCATTACTGATGGACAAATCTTTTGGAAACAGAA  
CCACCAATGTGATTTCCATTACTGATGGACAAATCTTTTGGAAACAGAA  
CCACCAATGTGATTTCCATTACTGATGGACAAATCTTTTGGAAACAGAA  
\* \*\*\*\*\* \*\* \* \*\*\*\*\* \*\* \*\*\*\*\*

Lotus japonicus  
BPM24\_atp1  
Millettia pinnata  
RRIM600\_atp1  
Arabidopsis thaliana

CTCTTTTATCGCGGAATTAGACCTGCTATTAACGTTCGGCTTATCTGTGAC  
CTCTTTTATCGCGGAATTAGACCTGCTATTAACGTTCGGCTTATCTGTGAC  
CTCTTTTATCGCGGAATTAGACCTGCTATTAACGTTCGGCTTATCTGTGAC  
CTCTTTTATCGCGGAATTAGACCTGCTATTAACGTTCGGCTTATCTGTGAC  
CTCTTTTATCGCGGAATTAGACCTGCTATTAACGTTCGGCTTATCTGTGAC







Lotus japonicus  
BPM24\_atp1  
Milletia pinnata  
RRIM600\_atp1  
Arabidopsis thaliana  
Brassica napus  
RRII105\_atp1  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
Silene latifolia  
PB235\_atp1  
RRIT251\_atp1  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_atp1  
Oryza sativa Japonica  
Cycas taitungensis  
Anomodon rugelii  
Anomodon attenuatus  
Megaceros aenigmaticus  
Phaeoceros laevis

AAAGAAAGATAGAACUAGATGCATTCTTAAAAGAAAAGCAAATTC--TT  
AAAGAAAGATGGAACUAGATGCATTCTTAAAAGAAAAGCGCTTTGCC--TT  
AAAGAAAGATAGAACUAGATGCATTCTTAAAAGAAAAGCAAAC--TT  
AAAGAAAGATGGAACNAGATGCATTCTTAAAAGAAAAGCGCTTTGCC--TT  
AAAGAAAAATGGAACUAGATGCTTTCTTAAAAGAAAAGAGCTTTAGC--TT  
AAAGAAAAATGGAACUAGATGCTTTCTTAAAAGAAAAGAGCTTTAGC--TT  
AAAGAAAGATGGAACUAGATGCATTCTTAAAAGAAAAGCGCTTTGCC--TT  
AAAAAAAGATGGAACACTAGATTCCTTCTTAAAAGAATGCGCTTTGAA--TT  
AAAAAAAGATGGAACACTAGATTCCTTCTTAAAAGAATGCGCTTTGAA--TT  
AAAAAAAGATGGAACACTAGATTCCTTCTTAAAAGAATGCGCTTTGAA--TT  
AAAAAAAGATGGAACACTAGATTCCTTCTTAAAAGAATGCGCTTTGAA--TT  
AAAGAAAGATGGAACUAGATGCATTCTTAAAAGAAAAGCGCTTTGCC--TT  
AAAGAAAGATGGAACUAGATGCATTCTTAAAAGAAAAGCGCTTTGCC--TT  
AAAGAAAGATGGAACUAGATGCATTCTTAAAAGAAAAGCGCTTTGCC--TT  
AAAGAAAGATGGAACAGATGCATTCTTAAAAGAAAAGCGCTTTGCC--TT  
AAAGAAAGATGGAACAGATGCATTCTTAAAAGAAAAGCGCTTTGCC--TT  
AAAGAAAGATTGAACUAGATGCTTTCTTAAAACAAACTGCGAAGGAGATT  
AAATAAGGATGAAACAGATGCTCCTTCAAAGAAAAGCGTTAACCT--TT  
AGATTGATAGTCAACTGGCTACCTTTTGTCAAAAATTTACACAGAG--CT  
AGATTGATAGTCAACTGGCTACCTTTTGTCAAAAATTTACACAGAG--CT  
AAATTAACAGTCAACTTGCACCTTTTCGCAAAAATTTGACACAGAG--CT  
AAATTAACAGTCAACTTGCACCTTTTTCGCAAAAATTTGACACAGAG--CT  
\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

Lotus japonicus  
BPM24\_atp1  
Milletia pinnata  
RRIM600\_atp1  
Arabidopsis thaliana  
Brassica napus  
RRII105\_atp1  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
Silene latifolia  
PB235\_atp1  
RRIT251\_atp1  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_atp1  
Oryza sativa Japonica  
Cycas taitungensis  
Anomodon rugelii  
Anomodon attenuatus  
Megaceros aenigmaticus  
Phaeoceros laevis

A-----AATCTGATGAAAAGGGTTCCT-----CCAGCTGTGGA-  
T-----CCTATGA-----  
ACTT-----AATATGATGATGAAAAAATG-----AAAAACATAGGT  
TCCT-----ATGA-----  
T-----AATTTAGCTTTTCATCACATTA-----GGAATCCTCAAT  
T-----AATTTAGCTTTTCATCACATTA-----GGAATCCTCAAT  
T-----CCTATGA-----  
ACTAATTCTTCTAACTTTCTATTTAT--TGAGA----TTAGATGTAATTA  
ACTAATTCTTCTAACTTTCTATTTATATTGAGA----TTAGATGTAATTA  
ACTAATTCTTCTAACTTTAGATTTAT--TGAGA----TTAGATGTAATTA  
ACCTAAAAAACAAAAGTGAAGTCTAAAATTTCC----TAAAAGATATAA  
TCCTATGA-----  
TCCTATGA-----  
ACCTATGATGCAAAATCAAACCTGGATGATGCAAGC---TGGAGGGGGTCC  
ACCTATGATGCAAAATCAAACCTGGATGATGCAAGCAGCTGGAGGGGGTCC  
TCCTATGA-----  
AATT-----AGATAGACCTTTTTATTTTTCGTCATTTCGATCACGAAA  
GCTGAGCGTGGCGAAGGTGAATCGATTCTCCAAATAAAAAGATACACAA  
TCTTAGC-----AACTCATTTCAGTTUAA-----  
TCTTAGC-----AACTCATTTCAGTTUAA-----  
TCTTAGC-----AACTCATTTCGTTTTGA-----  
TCTTAGC-----AACTCATTTCGTTTTAA-----

Lotus japonicus  
BPM24\_atp1  
Milletia pinnata  
RRIM600\_atp1  
Arabidopsis thaliana  
Brassica napus  
RRII105\_atp1  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
Silene latifolia  
PB235\_atp1  
RRIT251\_atp1

--AGCTCTTCGAGCTCCCCGACGTCAGAAGCCAGCGTGAACCA-ACA---  
-----  
CTGAGGATCCTGCCTCTTTTTATTTTGTATCTTGCTTATTTCTTATT---  
-----  
CAGTAAGAAAGAAAAGTTGTTAAGCAAAGACTGGAGAGGCCCCCGGTGCGA  
CAGTAAGAAAGAAAAGTTCTTAAGCAAAGACTGGAGAGGCCCCCGGTGCGA  
-----  
AGAATA--AAGGCTA-ATATCTTGCCGAAAGGCCGGG---AG--GGTGCCG  
AGAATA--AAGGCTA-ATATCTTGCCGAAAGGCCGGG---AG--GGTGCCG  
AGAATA--AAGGCTA-ATATCTTGCCGAAAGGCCGGG---AG--GGTGCCG  
AAAGTGTGAAAGAAA-GCACGAAAAGAAAATCCAATTTTGG--TAAGACT  
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Citrullus lanatus CCAGTGAATGTGAAATGTAGGTTTCAGAAAAAGGAACCGAGGTTATGAGA  
Cucurbita pepo CCAGTTCATGTGAAATGTAGGTTTCAGAAAAAGGAACCGAGGTTATGAGA  
RRIC110\_atp1 -----  
Oryza sativa Japonica ACAGGGATTCTGGAA---CGGCCAAGAATCCCAGCGGTTGTTCCGGTTCGA  
Cycas taitungensis TCGACGATCCTTGATTGGTTTGAATAGGGGCTCGTTTCTTGGGAGCGG  
Anomodon rugelii -----  
Anomodon attenuatus -----  
Megaceros aenigmaticus -----  
Phaeoceros laevis -----

Lotus japonicus A--ACAAGCCCCAAACCCCGAGCCCCAGAGCCTGTTGCCCT--TACCT  
BPM24\_atp1 -----  
Millettia pinnata GTTATATAAACTAAAGCATTGTTTCTTGAAACAATTGCTCTTGTGGCT  
RRIM600\_atp1 -----  
Arabidopsis thaliana GATGTAGTAAGTAGGTCTCCAATACTGGGAGACTGAGGAGAATGGGAGTT  
Brassica napus GATGTAGTAAGTAGGTCTCCAATACTGGGAGACTGAGGAGAATGGGAGTT  
RRII105\_atp1 -----  
Beta macrocarpa AGACCCGGGGCAACGGGGTCTTCCCATCATG---ATAGACTAAAGGGAAA  
Beta vulgaris vulgaris AGACCCGGGGCAACGGGGTCTTCCCATCATG---ATAGACTAAAGGGAAA  
Beta vulgaris maritima AGACCCGGGGCAACGGGGTCTTCCCATCATG---ATAGACTAAAGGGAAA  
Silene latifolia GGACTCTGAACACTAGAAAAAGAGCAACTAGGTTTCATCGTTCTTAAAAAGA  
PB235\_atp1 -----  
RRIT251\_atp1 -----  
Citrullus lanatus GTAAGTGGAGTTGGGCGGGGACTCTCCAGGG-CCTCATTTCATATCTCGA  
Cucurbita pepo GTAAGTGGAGTTGGGCGGGGCTACTCTCCAGGG-CCTCATTTCATATCTCGA  
RRIC110\_atp1 -----  
Oryza sativa Japonica AAAACCGAGAACAAGAC----ATGCCACAAAGTGGCAGATGAAGGCAGGG  
Cycas taitungensis AGATGATTAATCCCGCCAC---GCCAGAGCGGCAAGTAGGATCGAGGGTT  
Anomodon rugelii -----  
Anomodon attenuatus -----  
Megaceros aenigmaticus -----  
Phaeoceros laevis -----

Lotus japonicus TTCCCATCCTTTACTGGATGACAAC-ACTCGTAGCCAAGAACTAAATGAG  
BPM24\_atp1 -----  
Millettia pinnata TGACACCCCCCTTATTTATGATGGA-GGCCTTTCCTCCAGCTCCAGCTC  
RRIM600\_atp1 -----  
Arabidopsis thaliana TGTGGGTTGAGGGTGGCATGCTCCCCAGGGCCCTCTTTTTTTTAGATAGG  
Brassica napus TGTGGGTTGAGGGTGGCATGCTCCCCAGGGCCCTCTTTTTTTTAGATAGG  
RRII105\_atp1 -----  
Beta macrocarpa GTCGCTCGGAGATATTGGTTCGAATCCAATTCATCATTCCAGTTCATAAG  
Beta vulgaris vulgaris GTCGCTCGGAGATATTGGTTCGAATCCAATTCATCATTCCAGTTCATAAG  
Beta vulgaris maritima GTCGCTCGGAGATATTGGTTCGAATCCAATTCATCATTCCAGTTCATAAG  
Silene latifolia TTTTTTCTTACTTTCTTGTCTGTTATTATGATTCCTTGTCTCTGGTAGA  
PB235\_atp1 -----  
RRIT251\_atp1 -----  
Citrullus lanatus GGAGTGCGTTAGTGTTTTCGACTGAGGGACAAGTCAAGTGTACTTTAGGAAG  
Cucurbita pepo GGAGTGCGTTAGTCTTTTCGGCTGAGGGACAAGTCAAGTGTACTTTAGGAAG  
RRIC110\_atp1 -----  
Oryza sativa Japonica GGGAGAGCCTAGTCTCAACCTCTTCTTCCCCAAAAGGTAGTTATGAACG  
Cycas taitungensis AGAGAACGCGACCAGTTTCTTTTCGGACTGGCTGATCTTAACCTCGAGCC  
Anomodon rugelii -----  
Anomodon attenuatus -----  
Megaceros aenigmaticus -----  
Phaeoceros laevis -----

Lotus japonicus CGCGGGGGTCTTCATTGGCGGGGATATCTGACTCTGACAAGGAAGATTT  
BPM24\_atp1 -----  
Millettia pinnata TTCGAGCATACTAACC-CAGAAGCCAGCGTGAACCAAGAAGCCCCAAC





PB235\_atp4  
RRIC110\_atp4  
RRII105\_atp4  
RRIT251\_atp4  
BPM24\_atp4  
Spirodela polyrhiza  
RRIM600\_atp4  
Zea mays mays  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

TAATGAAGAAATGATAGTAGCTUGTTGTTTTATAGGCTTTATCATATTCA  
TAATGAAGAAATGATAGTAGCTUGTTGTTTTATAGGCTTTATCATATTCA  
TAATGAAGAAATGATAGTAGCTNGTTGTTTTATAGGCTTTATCATATTCA  
TAATGAAGAAATGATAGTAGCTUGTTGTTTTATAGGCTTTATCATATTCA  
TAATGAAGAAATGATAGTAGCTUGTTGTTTTATAGGCTTTATCATATTCA  
TAATGAAGAAATGATAGTAGCTCGTTGTTTTATAGGCTTTTTATCATATTCA  
TAATGAAGAAATGATAGTAGCTUGTTGTTTTATAGGCTTTATCATATTCA  
TAATGAAGAAATGATAGTAGCTUGTTGTTTTATAGGCTTTCTCATATTA  
TAATGAAGAAATGATAGTAGCTTGTCTGTTTTATAGGCTTTATCATATCCA  
TAATGAAGAAGTTCTTGTAGCTCGTAGTTTTATTGGTTTTGTATATTTA  
TAATGAAGAAGTTTTGTAGCTTGTAGTTTTATTGGTTTTGTATATTTA  
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Citrullus lanatus  
Cucurbita pepo  
Silene latifolia  
Lotus japonicus  
Milletia pinnata  
PB235\_atp4  
RRIC110\_atp4  
RRII105\_atp4  
RRIT251\_atp4  
BPM24\_atp4  
Spirodela polyrhiza  
RRIM600\_atp4  
Zea mays mays  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

GTCGGAAGAGTTTLAGGTAAGACTTTCAAAGCGACTUTCGACGGGAGAATC  
GTCGTCAGAGTTTLAGGTAAGACTTTCAAAGCGACTUTCGACGGGAGAATC  
GTCGGAAGAGTTTLAGGTAAGACTTTCAAAGTACTCTCGACGAGAGAATC  
GTCGGAAGAGTTTLAGGTAAGACTTTCAAAGTACTCTCGACGGGAGAATC  
GTCGGAAGAGTTTLAGGTAAGACTTTCAAAGTACTCTCGACGGGAGAATC  
GTCGGAAGAGTTTLAGGTAAGACTTTCAAAGTACTCTCGACGGGAGAATC  
GTCGGAAGAGTTTLAGGTAAGACTTTCAAAGTACTCTCGACGGGAGAATC  
GTCGGAAGAGTTTLAGGTAAGACTTTCAAAGTACTCTCGACGGGAGAATC  
GTCGGAAGAGTTTLAGGTAAGACTTTCAAAGTACTCTCGACGGGAGAATC  
GTCGGAAGAGTTTLAGGTAAGACTTTAAAAGTACTCTCGACGAGAGAATG  
GTCGGAAGAGTTTLAGGTAAGACTTTCAAAGTACTCTCGACGGGAGAATC  
GTCGGAAGAGTTTLAGGTAAGACTTTCAAAGAACTCTCGACGGGAGAATC  
GTCAGAAGAGTTCCGGTAATACTCTCAAAGCGATTTTCGACGGGAGAATC  
GTGAAAAAATTTTTGGTGAAGTTTTGAAAGTACTTCTAATGCGAGAAGC  
GTGAAAAAATTTTTGGTGAAGTTTTGAAAGTACTTCTAATGCGAGAAGC  
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Citrullus lanatus  
Cucurbita pepo  
Silene latifolia  
Lotus japonicus  
Milletia pinnata  
PB235\_atp4  
RRIC110\_atp4  
RRII105\_atp4  
RRIT251\_atp4  
BPM24\_atp4  
Spirodela polyrhiza  
RRIM600\_atp4  
Zea mays mays  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

CAGGCTATTCAGGAAGAATUGCAGCAATTTUCAATCCTAACGAAGTAGT  
CAGGCTATTCAGGACGAATUGCAGCAATTTUCAATCCTAACGAAGTAGT  
CAGGCTATTCAGGAAGAATUGCAGCAATTCUCAATCCTAACGAAGTAGT  
CAGGCTATTCAGGAAGAATUGCAGCAATTCUCAATCCTAACGAAGTAGT  
CAGGCTATTCAGGAAGAATUGCAGCAATTCUCAATCCTAACGAAGTAGT  
CAGGCTATTCAGGAAGAATUGCAGCAATTCUCAATCCTAACGAAGTAGT  
CAGGCTATTCAGGAAGAATUGCAGCAATTCUCAATCCTAACGAAGTAGT  
CAGGCTATTCAGGAAGAATUGCAGCAATTCUCAATCCTAACGAAGTAGT  
CAGGCTATTCAGGAAGAATUGCAGCAATTCUCAATCCTAACGAAGTAGT  
GAGTCTATTCAGGAAGAATCGCAGCAATTCUCAATCCTAACGAAGTCGT  
CAGGCTATTCAGGAAGAATNGCAGCAATTCUCAATCCTAACGAAGTAGT  
GAGTCTATTCAGGAATCATTGCAGCAATTCUCAATCCTAACGAAGTCAT  
GGAGCTATTCAGAAAGAATTGCAGCAATTCUCAATCCTAACGAAGTTGT  
GAAGCAATTTTTTCAGAGTTACAGCAATTGATAAGTTCTAAAGAGGCTCT  
GAAGCAATTTTTTCAGAGTTACAGCAATTGATAAGTTCTAAAGAGGCTCT  
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Citrullus lanatus  
Cucurbita pepo  
Silene latifolia  
Lotus japonicus  
Milletia pinnata  
PB235\_atp4  
RRIC110\_atp4  
RRII105\_atp4  
RRIT251\_atp4  
BPM24\_atp4  
Spirodela polyrhiza  
RRIM600\_atp4  
Zea mays mays

TCUTUUGGAATCCAATGAACAACAACGATTACTTA-----GGATCAGTT  
TCUTUUGGAATCCAATGAACAACAACGATTACTTA-----GGATCAGTT  
TCUTUUGGAATCCAATGAACAACAACGATTACTTA-----GGATCAGCT  
TCUTUUGGAATCTAATGAACAACAACGATTACTTA-----GGATCAGTT  
TCUTUUGGAATCTAATGAACAACAACGATTACTTA-----GGATCAGTT  
TCCTCCGGAATCCAATGAACAACAACGATTACTTA-----GGATCAGCT  
TCCTCCGGAATCCAATGAACAACAACGATTACTTA-----GGATCAGCT  
TCCTCCGGAATCCAATGAACAACAACGATTACTTA-----GGATCAGCT  
TCCTCCGGAATCCAATGAACAACAACGATTACTTA-----GGATCAGCT  
TCCTCCGGAATCCAATGAACAACAACGATTACTTA-----GGATCAGCT  
TCCTCCGGAATCCAATGAACAACAACGATTACTTA-----GGATCAGCT  
TCCTCCGGAATCCAATGAACAACAACGATTACTTA-----GGATCAGCT  
TCCTCCGGAATCCAATGAACAACAACGATTACTTA-----GGATCAGCT  
TCTGGAGGAATCCAATGAACAACAACGATTACTTAATCTACGGATCAGCT





RRIM600\_atp4  
Zea mays mays  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

GTGGGGGGTTCTCTT----AAGAAT-----AAAGAAGATGAATAG-----  
G-AAGGCTTTATAGTCTCAGAAAAGGT---GAGGGTGGGGGGTATCCCCG  
AATGGAGGGCATUGACCT-AAGAACGG-GAGAATTGAAGGGGAATGATGA  
AATGAAAAATTTTGCAC--AAAGATGGCTTTTTTCCACAAACCACAAGTG  
AATGAAAAATTTTGCAC--AAAGATGGCTTTTTTCCACAAACCACAAGTG  
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Citrullus lanatus  
Cucurbita pepo  
Silene latifolia  
Lotus japonicus  
Milletia pinnata  
PB235\_atp4  
RRIC110\_atp4  
RRII105\_atp4  
RRIT251\_atp4  
BPM24\_atp4  
Spirodela polyrhiza  
RRIM600\_atp4  
Zea mays mays  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

AATTCATGTTTCATGCTAACAGAAGAGCGAATCCAATACCAAGACGACTTC  
AATTCATGTTTCATGCTAACAGAAGAGCGAATCCAATACCAAGACGACTTC  
AATTCATGTTTCATGCTAACAGAAGAGCGGATCCAATACCAAGACGACTTC  
AATTCATGTTTCATGCTAACAGAAGAGCGGATCCAATACACAGACAACCTTC  
AATTCATGTTTCATGCTAACAGAAGAGCGGATCCAATACACAGACAACCTTC  
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CATT-----  
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GGACCTGTGGAGACGGGGTGGGCTGTAGCTCTGAGGATTAGAGCACGTG  
GAATAATTATAGTTATAGCATCTCTTC--TTCCAAAGCTCGATCGCCGCG  
CGACGCTCTGCATGCTATAGTCGCTGGGTCTCGAGCAACCC-----  
CGACGCTCTGCATGCTATAGTCCCTGGGTCTCGAGCCACCC-----

Citrullus lanatus  
Cucurbita pepo  
Silene latifolia  
Lotus japonicus  
Milletia pinnata  
PB235\_atp4  
RRIC110\_atp4  
RRII105\_atp4  
RRIT251\_atp4  
BPM24\_atp4  
Spirodela polyrhiza  
RRIM600\_atp4  
Zea mays mays  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

TTTCTCAGGAAGTGCAGCAAGTACTTGAGTCATTT-----  
TTTCTC-----  
TTTCTCAGAAA----AGCAAGTACTTGAAGAATTTTTTG-----  
TTTCTCAAAAAGTACTTGCTGCACT-----  
TTTCTCAAAAAGTACTTGCTGCA-----  
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GCTACGAACCACGGTGTGCGGGGTTCGAATCCACTTCTGAGCGGGCTGGC  
AAACCCAAT-----  
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Citrullus lanatus  
Cucurbita pepo  
Silene latifolia  
Lotus japonicus  
Milletia pinnata  
PB235\_atp4  
RRIC110\_atp4  
RRII105\_atp4  
RRIT251\_atp4  
BPM24\_atp4  
Spirodela polyrhiza  
RRIM600\_atp4  
Zea mays mays  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

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GGCTCCACCGGGAGCGAGCCTACTGAAGG  
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### atp6 multiple sequence alignment

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Megaceros aenigmaticus -----
Phaeoceros laevis -----
Cycas taitungensis -----
Beta macrocarpa -----CAAAGACTCCCATGCCTTTCTTGG
Beta vulgaris maritima -----CAAAGACTCCCATGCCTTTCTTGG
Beta vulgaris vulgaris -----CAAAGACTCCCATGCCTTTCTTGG
Citrullus lanatus -----GCCTTTCTTGG
Cucurbita pepo -----CCTCTCCCATCCCATGCCTTTCTTGG
Arabidopsis thaliana GCATTAACGCAAGATCCC-----GAAATGGGCTTGATTTTGG
Brassica napus -----C-----GACCTCG-CAAGGTTTT--
Silene latifolia GAATTGACGGGGGATCCTCATAATCATAAATAAAAGGGCTCAGATTATGG
RRII105_atp6 -----
PB235_atp6 -----
BPM24_atp6 -----
RRIC110_atp6 -----
RRIT251_atp6 -----
RRIM600_atp6 -----
Millettia pinnata -----
Oryza sativa Japonica GATTATAACGTGAAGCTCGTTGAAGAGAAGGAGACAAGCAGAAATAGACGC
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Megaceros aenigmaticus -----
Phaeoceros laevis -----
Cycas taitungensis -----TTTCCTGGTCAAACCAACCGGCGATTCTCGCTTGCTCGGAGG
Beta macrocarpa TCGGACCAACCCAACCGGTGATT-----TCCGACAAGTCTTTCTTC-
Beta vulgaris maritima TCGGACCAACCCAACCGGTGATT-----TCCGACAAGTCTTTCTTC-
Beta vulgaris vulgaris TCGGACCAACCCAACCGGTGATT-----TCCGACAAGTCTTTCTTC-
Citrullus lanatus TTGGACCAACTCAACCGGCGATTGATTGATTTCCTACAAGTCAGTCTTCC
Cucurbita pepo TTGGACCAACCCAACCGGCGATT-----TCCGACAAGTCTTTCTTC-
Arabidopsis thaliana GCGAAGCTTTACATGCGGAAAGCGACAATGTCCCTTTTTTGCAGTCCATT
Brassica napus -TGAAGCGGCCGAAGCGGGAAGTGACAATACCGCTTTTCTTCAGCACATT
Silene latifolia CCGAGGCTTCGCATGCAGAAAGTCAGAATATTGAGTTTATGGATTACATT
RRII105_atp6 -----
PB235_atp6 -----
BPM24_atp6 -----
RRIC110_atp6 -----
RRIT251_atp6 -----
RRIM600_atp6 -----
Millettia pinnata -----
Oryza sativa Japonica TTTTTTTGAACCATTTGAGAGGGCGCAGCGTATCCGTTTCAATAACTGGC
```

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Megaceros aenigmaticus -----
Phaeoceros laevis -----
Cycas taitungensis GGCAAGCAAAAAACGAGT--CTTTCAATTTTGGGAGCAAGAAGTACGGGAA
Beta macrocarpa ----ATTTTTGAGCAAG--AAGCGGAACTACAGGGATGAAATGAAAAGTG
Beta vulgaris maritima ----ATTTTTGAGCAAG--AAGCGGAACTACAGGGATGAAATGAAAAGTG
Beta vulgaris vulgaris ----ATTTTTGAGCAAG--AAGCGGAACTACAGGGATGAAATGAAAAGTG
Citrullus lanatus TGAATTGGTCGAGCAAG--AAGCGGAACTACAGGGATGAAATGCTAAGTG
Cucurbita pepo ---ATTTTTGCGAGCAAG--AAGCGGAACTACAGGGATGAAATGAAAAGTG
Arabidopsis thaliana GCTGATGATTTAACCCA--AAACGGAGTATCCGGGGAAGCCTTTCAAGAA
Brassica napus TTGGATGATTTGAGCGA--AAACGGAGTACAAAAGTTCAGCCTTTAAGGAG
Silene latifolia GCGACGGATTTGGACAC--AAACGGAGTAGCCAGTGAGTCTATAGGGAA
RRII105_atp6 -----
PB235_atp6 -----
BPM24_atp6 -----
RRIC110_atp6 -----
RRIT251_atp6 -----
RRIM600_atp6 -----
Millettia pinnata -----TGTTATTTACCA--ATATGGATCA-CAGTTGAATCCTACCGGGAG
Oryza sativa Japonica AGAACGGAATAGAGTTGTTAGATGGGGCTGAATGGAGGAACGGCGATATA
```













RRIC110\_atp6  
RRIT251\_atp6  
RRIM600\_atp6  
Millettia pinnata  
Oryza sativa Japonica

CATTAACCGGTCTGGAATTAGGTGTAGCTATATTACAAGCTUATGTTTUT  
CATTAACCGGTCTGGAATTAGGTGTAGCTATATTACAAGCTNATGTTTTNT  
CATTAACCGGTCTGGAATTAGGTGTAGCTATATTACAAGCTNATGTTTTNT  
CATTAACCGGTCTGGAATTAGGTGTAGCTATATUACAAGCTUATGTTTUT  
CATTAACCGGTCTGGAATTAGGTGTAGCTATATTACAAGCTUATGTTTUT  
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Megaceros aenigmaticus  
Phaeoceros laevis  
Cycas taitungensis  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
Silene latifolia  
RRII105\_atp6  
PB235\_atp6  
BPM24\_atp6  
RRIC110\_atp6  
RRIT251\_atp6  
RRIM600\_atp6  
Millettia pinnata  
Oryza sativa Japonica

ACTACTCCAAATCGCACTTACCTCAATGATGCTATAAACCTTCATTAA--  
ACTACTCCAAATTGCACTTACTTCAATGATGCTATAAACCTTCATTAA--  
ACAATCTCAATTTGTACTTACTCGAATGATGCTACAAATCCTCATUGAAG  
ACGATCTTAATCTGTATTTACTTGAATGATGCTAUAAATCTCCATUAAAA  
ACGATCTTAATCTGTATTTACTTGAATGATGCTAUAAATCTCCATUAAAA  
ACGATCTTAATCTGTATTTACTTGAATGATGCTAUAAATCTCCATUAAAA  
ACGATCTUAAATCTGTATTTACTTGAATGATGCTAUAAATCTCCATUAAAA  
ACGATCTCAATCTGTATTTACTTGAATGATGCTACAAATCTCCATCAAAA  
ACGATCTTAATCTGTATTTACTTGAATGATGCTATAAATCTCCATTAAAG  
ACGATCTTAATCTGTATTTACTTGAATGATGCTATAAATCTCCATTAAAG  
ACGATCTTAATCTGTATTTACTTGAATGATGCTAUAAATCTCCATUAAAA  
ACGATCTTAATCTGTATTTACTTGAATGATGCTACAAATCTCCATCAAAG  
ACGATCTTAATCTGTATTTACTTGAATGATGCTACAAATCTCCATCAAAG  
ACGATCTTAATCTGTATTTACTTGAATGATGCTACAAATCTCCATCAAAG  
ACGATCTTAATCTGTATTTACTTGAATGATGCTACAAATCTCCATCAAAG  
ACGATCTTAATCTGTATTTACTTGAATGATGCTACAAATCTCCATCAAAG  
ACGATCTTAATCTGTATTTACTTGAATGATGCTACAAATCTCCATCAAAG  
ACGATCTUAAATATGTATTTACTTGAATGATGCTATAAATCTCCATUAAAC  
ACGATCTUAAATTTGTATTTACTTGAATGATGCTATAAATCTCCATUAAAA  
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Megaceros aenigmaticus  
Phaeoceros laevis  
Cycas taitungensis  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
Silene latifolia  
RRII105\_atp6  
PB235\_atp6  
BPM24\_atp6  
RRIC110\_atp6  
RRIT251\_atp6  
RRIM600\_atp6  
Millettia pinnata  
Oryza sativa Japonica

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-----  
GATCAATTTTTTTT-----ATAATTGAACAAAAGCTTCGAGCAGG  
TTCTTTTTTCTTT-----TTATTAGAATTTTTATAATTGAACAA  
TTCTTTTTTCTTT-----TTATTAGAATTTTTATAATTGAACAA  
TTCTTTTTTCTTT-----TTATTAGAATTTTTATAATTGAACAA  
TGGTTATTTTTTT-----ATAATTGAACAAAAGCGA--GGCTCG  
TAGTTATTTATTT-----ATAATTGAACAAAAGCGA--GGAGAG  
TTCTTCTTTCTTTTATTTATTTATAATTGAACAAAAGCGA--GGGATG  
TTCTTCTTTCTTTTATTTAGATTTATAATTGAACAAAAGCGA--GGGATG  
TGGTTCTTTTTTTTAGAGTAAAGGGA--GGTCTTCAGTAGCCA--TCGCAG  
TGGTTCTTTTTTT-----ATAATTGAACAAAAGCGA--GGAGCG  
TGGTTCTTTTTTT-----ATAATTGAACAAAAGCGA--GGAGCG  
TGGTTCTTTTTTT-----ATAATTGAACAAAAGCGA--GGAGCG  
TGGTTCTTTTTTT-----ATAATTGAACAAAAGCGA--GGAGCG  
TGGTTCTTTTTTT-----ATAATTGAACAAAAGCGA--GGAGCG  
TTTTTTGTTATTT-----ATAATTGAACAAAAGCGA--GGAGCG  
TGAGTAATTTTATAATTGAATAAAAACGAGGAGCCGAAGATTTTAGGGG

Megaceros aenigmaticus  
Phaeoceros laevis  
Cycas taitungensis  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
Silene latifolia  
RRII105\_atp6  
PB235\_atp6

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GTGCGCTGCTCTTTTTCTCCCCGAAGAACAAGACGGGATAGATTCAAT  
AAGCGAGGTATTTATGCTTAAGTCATCGCTTCAAATCCAATAAGGGATCA  
AAGCGAGGTATTTATGCTTAAGTCATCGCTTCAAATCCAATAAGGGATCA  
AAGCGAGGTATTTATGCTTAAGTCATCGCTTCAAATCCAATAAGGGATCA  
ATGTAATTGAGCTCGAACGAGGATCCCTTTGAAGAAGGAATTGAGAGTCA  
AGAGAAGCT-GCGAGACCGTAAAG---TAAAGGACAGAAGAGAAGATGC  
GATGTCTGAGCGGTTGAAAGAGTCGGTCTTGAAAACCGAAGTATTTCTAG  
AGAGT---AGTGTATTTAGAG-CAGTTACACAGCCC---CTCTCCTTG  
GGTTCAT-TGCTTTTTTTTTTTTTCAATAAAAAGGAGACTAGTCCCCGAAA  
GAAGCCA-GTGCACGGAGAGGAGCGGATATGAAAACGAAGGCTAGATTTT  
GAAGCCA-GTGCACGGAGAGGAGCGGATATGAAAACGAAGGCTAGATTTT











Silene latifolia  
 BPM24\_atp8  
 PB235\_atp8  
 Lotus japonicus  
 Millettia pinnata  
 RRIC110\_atp8  
 RRIM600\_atp8  
 RRIT251\_atp8  
 RRII105\_atp8  
 Cycas taitungensis

GAATTCCTTTCAAGGACGGGATGGGGGATCACTGGTA-----AGAATGA  
 -AATCCT-----GGATGGGGGATCACTTGTACTTGTAGTAATGA  
 -AATCCT-----GGATGGGGGATCACTTGTACTTGTAGTAATGA  
 -AATCCT-----GGATGGGTGATCACTTGT-----GGAATGA  
 -AATCCT-----GGTGGGTGATCACTTGT-----GGAATGA  
 -AATCCT-----GGATGGGGGATCACTTGTACTTGTAGTAATGA  
 -AATCCT-----GGATGGGGGATCACTTGTACTTGTAGTAATGA  
 -AATCCT-----GGATGGGGGATCACTTGTACTTGTAGTAATGA  
 -AATCCT-----GGATGGGGGATCACTTGTACTTGTAGTAATGA  
 -AATCCT-----GGATGGGGGATCACTTGTACTTGTAGTAATGA  
 -AATCCT-----ATATCTGGATGGAGGATTCCTTGT-----GGAATGA  
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Citrullus lanatus  
 Cucurbita pepo  
 Beta macrocarpa  
 Beta vulgaris maritima  
 Beta vulgaris vulgaris  
 Silene latifolia  
 BPM24\_atp8  
 PB235\_atp8  
 Lotus japonicus  
 Millettia pinnata  
 RRIC110\_atp8  
 RRIM600\_atp8  
 RRIT251\_atp8  
 RRII105\_atp8  
 Cycas taitungensis

CATAATGCTAATCCATGTTCTACACGGCCAAGGAAGCATCGTTTTTTAAT  
 CATAATGCTAATCCATGTTCTACACGGCCAAGGAAGCATCGTTTTTTAAT  
 CATAATGCTAATCCATGTTCTACACGGCCAAGAAAAG--TGGGAAAATAGA  
 CATAATGCTAATCCATGTTCTACACGGCCAAGAAAAG--TGGGAAAATAGA  
 CATAATGCTAATCCATGTTCTACACGGCCAAGAAAAG--TGGGAAAATAGA  
 CATAACGCTAATCCATGCTCTAAACGGCCAAGAAAAG--CGGAAACATAAA  
 CATAATGCTAATCCATGTTCTACACGGCCAAGGAAG--CATCGTTTTTTA  
 CATAATGCTAATCCATGTTCTACACGGCCAAGGAAG--CATCGTTTTTTA  
 CATAATGCTAATCCATGTTCTACACGGCCAAGGAAGAATCAAAAAATAA-  
 CATAATGCTAATCCATGTTCTACACGGCCAAGGAAGAATAAAAAATAAT  
 CATAATGCTAATCCATGTTCTACACGGCCAAGGAAGCATCGTTTTTTA  
 CATAATGCTAATCCATGTTCTACACGGCCAAGGAAGCATCGTTTTTTA  
 CATAATGCTAATCCATGTTCTACACGGCCAAGGAAGCATCGTTTTTTA  
 CATAATGCTAATCCATGTTCTACACGGCCAAGGAAGCATCGTTTTTTA  
 CATAATGCTGATCCATGTTTTACACGGCCAGGTAACATCGTTTGTAAAG  
 \*\*\*\*\* \*\* \* \*\*\*\*\* \* \* \*\*\*\*\* \* \*\*

Citrullus lanatus  
 Cucurbita pepo  
 Beta macrocarpa  
 Beta vulgaris maritima  
 Beta vulgaris vulgaris  
 Silene latifolia  
 BPM24\_atp8  
 PB235\_atp8  
 Lotus japonicus  
 Millettia pinnata  
 RRIC110\_atp8  
 RRIM600\_atp8  
 RRIT251\_atp8  
 RRII105\_atp8  
 Cycas taitungensis

CTCATTATGACTTGGTTCGTTTCGGAAGAGATTCTTTCTCGATCAGA---A  
 CTCATTATGACTTGGTTCGTTTCGGAAGAGATTCTTTCTCGATCAGAT---A  
 AAGATGTTAATAACCATCATAGTAGGCATTTTGGCTCTTAGTTGTT-----  
 AAGATGTTAATAACCATCATAGTAGGCATTTTGGCTCTTAGTTGTT-----  
 AAGATGTTAATAACCATCATAGTAGGCATTTTGGCTCTTAGTTGTT-----  
 AAAATTTATATAACCATCATGGTGGGCATTCTTTTACTACTTTCCCT  
 A-----  
 A-----  
 --GAATGGTATTGCTTCTTTTATAATAG-----CGTTCGTTTCATA-----  
 AAAAAAGGTATTGCTTTTTTATAATAGTTGCTCGTTTCGTTTCATA-----  
 -----  
 -----  
 -----  
 -----  
 TGGTAATTCCTGGTCGTTTGAAGAGAAACCCGGGACAGACCGTTTCTT

Citrullus lanatus  
 Cucurbita pepo  
 Beta macrocarpa  
 Beta vulgaris maritima  
 Beta vulgaris vulgaris  
 Silene latifolia  
 BPM24\_atp8  
 PB235\_atp8  
 Lotus japonicus  
 Millettia pinnata  
 RRIC110\_atp8  
 RRIM600\_atp8  
 RRIT251\_atp8  
 RRII105\_atp8  
 Cycas taitungensis

TAGTAGAAAAGCATTACAAGAGATA-----  
 TAGTAGAAAAGCATTACAAGAGAT-----  
 -----ATTTATTTT-CAATATTATCACCTTACAACCCAAAAGAAG  
 -----ATTTATTTT-CAATATTATCACCTTACAACCCAAAAGAAG  
 -----ATTTATTTT-CAATATTATCACCTTACAACCCAAAAGAAG  
 CCTGGGGATTTACTTT-CTATTTTATCATGT----ATCCAAGAAA--  
 -----  
 -----  
 -----AATTAACCTCGACCACTTGTAGTCTTGCTACACGA-----  
 -----AATTAACCTCGACCACTTGTAGTCTTG-----  
 -----  
 -----  
 -----  
 -----  
 T-----ATTTGTTTCGATAAGGGCGGG-----



Cycas taitungensis  
Silene latifolia  
BPM24\_atp9  
RRII105\_atp9  
RRIC110\_atp9  
PB235\_atp9  
RRIT251\_atp9  
RRIM600\_atp9  
Pleurozia purpurea  
Oryza sativa Indica  
Oryza sativa Japonica  
Zea mays mays  
Lotus japonicus  
Millettia pinnata

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CTGTCGGTATTGGAAACGTCCTTAGTTCCTCGAT-----CCATCCC  
CTGTCGGTATTGGAAACGTCCTTAGTTCCTTGAT-----TCATTCC  
CTGTCGGTATTGGAAATGTCTTCAGTTCCTTGAT-----CCATTCC  
CTGTCGGTATTGGAAATGTCTTCAGTTCCTTGAT-----CCATTCC  
CTGTCGGTATTGGAAATGTCTTCAGTTCCTTGAT-----CCATTCC  
CTGTCGGTATTGGAAATGTCTTCAGTTCCTTGAT-----CCATTCC  
CTGTCGGTATTGGAAATGTCTTCAGTTCCTTGAT-----CCATTCC  
CTGTAGGTATTGGAAACGTTTTAGTTCCTTGAT-----TCATTCT  
CTGTCGGTATTGGAAACGTCCTCAGTTCCTCGAT-----TCATTCC  
CTGTCGGTATTGGAAACGTTUUCAGTTCCTUUGAT-----TCATTCC  
CTGTCGGTATTGGAAACGTTUUCAGTTCCTUUGAT-----TCATTCC  
CTGTAGGTATTGGAAACGTAATTCAGTTCATTAAT-----TCATTCC  
CTGTAGGTATTGGAAACGTAATTCAGTTCATTAAT-----TCATTCC  
*          ***** **          ***** *          *** *
```

Arabidopsis thaliana  
Brassica napus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Megaceros aenigmaticus  
Phaeoceros laevis  
Cycas taitungensis  
Silene latifolia  
BPM24\_atp9  
RRII105\_atp9  
RRIC110\_atp9  
PB235\_atp9  
RRIT251\_atp9  
RRIM600\_atp9  
Pleurozia purpurea  
Oryza sativa Indica  
Oryza sativa Japonica  
Zea mays mays  
Lotus japonicus  
Millettia pinnata

```
GTGGCGCGAAATCCATCATTGGCTAAACAATUATTTGGTTATGCCATTTT  
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GTGGCTAGAAATCCGTCATTAGCTAAACAATTATTTGGTTATGCCATTTT  
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GTGGCGCGAAATCCTTCATTGGCTAAACAATUATTCGGTTATGCCATTTT  
GTGGCAAGAAATCCATCATTGGCAAAGCAGTTATTCGGATATGCAATCCT  
GTGGCAAGAAATCCATCATTGGCAAAGCAGTTATTCGGATATGCAATCCT  
** ** ***** *          ** ** ** ** ** ** ** ** ** ** ** ** ** ** ** *          *          *          *
```

Arabidopsis thaliana  
Brassica napus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Megaceros aenigmaticus  
Phaeoceros laevis  
Cycas taitungensis  
Silene latifolia  
BPM24\_atp9  
RRII105\_atp9  
RRIC110\_atp9  
PB235\_atp9  
RRIT251\_atp9  
RRIM600\_atp9  
Pleurozia purpurea  
Oryza sativa Indica  
Oryza sativa Japonica  
Zea mays mays

```
GGGCTTTGCTCTAACCGAAGCTATTGCATTGTTTGCCCUAATGATGGCCT  
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AGGCTTTGCTTTAACCGAGGCTATTGCCTTATTCGCCCTAATGATGGCCT  
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GGGCTTTGCTCTCACC GAAGCTATTGCATTGTTTGCCCAATGATGGCCT  
GGGCTTTGCTCTCACC GAAGCTATTGCATTGTTTGCCCUAATGATGGCCT  
GGGCTTTGCTCTCACC GAAGCTATTGCATTGTTTGCCCUAATGATGGCCT
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Lotus japonicus  
Millettia pinnata

GGGCTTTGCTCTAACCGAGGCTATTGCCTTGTTTCGCATTAATGATGGCCT  
GGGCTTTGCTCTAACCGAGGCTATTGCCTTGTTTCGCATTAATGATGGCCT  
\*\* \* \*\*\* \*\* \* \* \*\* \* \* \*\* \* \* \*\* \* \* \*\* \* \* \*\* \* \*

Arabidopsis thaliana  
Brassica napus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Megaceros aenigmaticus  
Phaeoceros laevis  
Cycas taitungensis  
Silene latifolia  
BPM24\_atp9  
RRII105\_atp9  
RRIC110\_atp9  
PB235\_atp9  
RRIT251\_atp9  
RRIM600\_atp9  
Pleurozia purpurea  
Oryza sativa Indica  
Oryza sativa Japonica  
Zea mays mays  
Lotus japonicus  
Millettia pinnata

TTTTGATCTTATTCGTATTCTGA-----  
TTTTGATCTTATTCGTATTCTGAT-----CGAAGAAAGAAGGTTTC  
TTTTGATCTUATTCGTATTCUGAT-----CGAAGAAAGA----AGG  
TTTTGATCTUATTCGTATTCUGAT-----CGAAGAAGGG----TTC  
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TTTTGATTTUATTCGTATTCUGATT---TTTTCAAAGAAAGGGAAGCTG  
TTTTGATTTUATTCGTATTCUGATT---TTTTCAAAGAAAGGGAAGCTG  
CTTCAACATCATTTGCCTTTTAA-----  
CTTCAATATCATTTGCCTTTTAA-----  
TTTTGATCTCATCCGTATTCUGAT---AGAGTTGGGGGAGGAACAAAGAG  
TTTTAATCTUATTCGTCTTCTGA-----GCTTCTGTCTTTCATTCTGAT  
TTTTGATCTTATTTGTATTCUGATCGAAGGTTTCTTTTTCTCTCATAAAG  
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TTTTGATTTCTTTTGTCTTCTAAGTTTCTCTTTTCAAAGGTTAGTCCC  
\* \* \* \* \*

Arabidopsis thaliana  
Brassica napus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Megaceros aenigmaticus  
Phaeoceros laevis  
Cycas taitungensis  
Silene latifolia  
BPM24\_atp9  
RRII105\_atp9  
RRIC110\_atp9  
PB235\_atp9  
RRIT251\_atp9  
RRIM600\_atp9  
Pleurozia purpurea  
Oryza sativa Indica  
Oryza sativa Japonica  
Zea mays mays  
Lotus japonicus  
Millettia pinnata

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TTTCAGTCTCATAAAGCAA-----  
AGTC-GTCTCATAAAGCAAGAC-----  
GCGGGGCCC-----  
GCGGGGCCCCA-----  
GCGGGGCCC-----  
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TCTTTG-----  
GTCTTCCT-----  
TGAGGACG-----  
TGAGGAAG-----

#####  
ccmFc multiple sequence alignment

Beta macrocarpa  
Beta vulgaris maritima  
Silene latifolia  
PB235\_ccmFc  
RRIT251\_ccmFc  
RRIC110\_ccmFc

ATGGTCCAACACTACATAAATTTTCTTTTTCATTACTTUCATGGTCGTGCU  
ATGGTCCAACACTACATAAATTTTCTTTTTCATTACTTUCATGGTCGTGCU  
ATGGTCCAACACTACATAAATTTTCTTTTTCATTACTTUCATGGTCGTGCU  
ATGGTCCAACACTACATAAATTTTCTTTTTCATTACTTCCATGGTCGTGCC  
ATGGTCCAACACTACATAAATTTTCTTTTTCATTACTTCCATGGTCGTGCC  
ATGGTCCAACACTACATAAATTTTCTTTTTCATTACTTCCATGGTCGTGCC

BPM24\_ccmFc  
RRII105\_ccmFc  
RRIM600\_ccmFc  
Brassica napus  
Carica papaya  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Vigna radiata  
Oryza sativa Indica  
Oryza sativa Japonica  
Tripsacum dactyloides  
Zea luxurians  
Zea mays parviglumis  
Zea perennis  
Sorghum bicolor  
Cycas taitungensis

ATGGTCCAACACTACATAACTTTTTCTTTTTTCACTACTTCCATGGTCGTGCC  
ATGGTCCAACACTACATAACTTTTTCTTTTTTCACTACTTCCATGGTCGTGCC  
ATGGTCCAACACTACATAACTTTTTCTTTTTTCACTACTTCCATGGTCGTGCC  
ATGGTCCAACACTACATAACTTTTTCTTTTTTATTCTTTTTATGGTCGTGCU  
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ATGGTCCAACACTAAATAACTTTTTCTTTTTTCACTACTTCCATGGTCGTGCC  
ATGGTCCAACACTAAATAACTTTTTCTTTTTTCACTACTTCCATGGTCGTGCC  
ATGGTCCAACACTACATAACTTTTTCTTTTTTCACTACTTUTATGGTCGTGCU  
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ATGGTCCAACACTACAGAACTTCTCTTTTTTCACTACTTUTCATGGTCGTGCU  
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ATGGTCCAACACTACAGAACTTCTCTTTTTTCACTACTTCCATGGTCGTGCC  
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ATGGTCCAACACTACAGAACTTCTCTTTTTTCACTACTTCCATGGTCGTGCC  
ATGGTCCAACACTACAGAACTTCTCTTTTTTCACTACTTCCATGGTCGTGCC  
\* \*\*\*\*\* \* \* \*\*\*\*\* \*\* \*\*\*\*\* \*\*\* \*\* \*\*\*\*\*

Beta macrocarpa  
Beta vulgaris maritima  
Silene latifolia  
PB235\_ccmFc  
RRIT251\_ccmFc  
RRIC110\_ccmFc  
BPM24\_ccmFc  
RRII105\_ccmFc  
RRIM600\_ccmFc  
Brassica napus  
Carica papaya  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Vigna radiata  
Oryza sativa Indica  
Oryza sativa Japonica  
Tripsacum dactyloides  
Zea luxurians  
Zea mays parviglumis  
Zea perennis  
Sorghum bicolor  
Cycas taitungensis

TTGTGGCAGGGCAGCACCCGTACTATTGAAATGGTTCGTTCAGTAGAGATG  
TTGTGGCAGGGCAGCACCCGTACTATTGAAATGGTTCGTTCAGTAGAGATG  
TTGTGGCAGGGCAGCACCCGTACTATTGAAATGGTTCGTTCAGTAGAGATG  
TCGTGGCAGGGCAGCACCCGTACTATTGAAATGGTTTGTTCAGTAGAGATG  
TCGTGGCAGGGCAGCACCCGTACTATTGAAATGGTTTGTTCAGTAGAGATG  
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CUGTGGCAGGGCAGCACCCGTACTATTGAAATGGTTCGTTCAGTAGAGATG  
CCGTGGCAGGGCAGCACCCGTACTATTGAAATGGTTCGTTCAGTAGAGATG  
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CCGTGGCAGGGCAGCACCCGTACTATTGAAATGGTTCGTTCAGTAGAGATG  
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CCGTGGCAGGGCAGCACCCGTACTATTGAAATGGTTCGTTCAGTAGAGATG  
TCGTGGCAGGGCAGCACCCGTACTATTGAAATGGTTCGTTCAGTAGAGATG  
\*\*\*\*\*

Beta macrocarpa  
Beta vulgaris maritima  
Silene latifolia  
PB235\_ccmFc  
RRIT251\_ccmFc  
RRIC110\_ccmFc  
BPM24\_ccmFc  
RRII105\_ccmFc  
RRIM600\_ccmFc  
Brassica napus  
Carica papaya  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Vigna radiata

TTTCCACAGGTGCCCTTTTTUUAATGGTACTTTAATTCCTATTCTTATC  
TTTCCACAGGTGCCCTTTTTUUAATGGTACTTTAATTCCTATTCTTATC  
TTUCCACAGGTGCCCTTTTTUUAATGGTACTTTAATTCCTATTCTTATC  
TTCCCATAGGTGCCCTTCTTCCAATGGTACTATAAATCCTATTCTTATA  
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TTCCCACAGGTGCCCTTCTTCCAATGGTACTATAAATTCCTATTCTATC  
TTUCCACAGGTGCCCTTTUCCAATGGTACTATAAATTCCTATTCTATC  
TTUCCACAGGTGCCCTTTUCCAATGGTACTATAAATTCCTATTCTATC  
TTUCCACAGGTGCCCTTTTTUCAATGGGACTATAAATTCCTATTCTTATC  
TTCCCACAGGTGCCCTTTTTCCAATGGGACTATAAATTCCTATTCTTATC







Carica papaya -----GGGGGACTTCTCATATTTAGAATCTTTCTGCGGTGTGCTCCGTT  
 Citrullus lanatus -----GGGAGACTTCTCATATTTTGAATCTTTCTGCGGTGTGCTCTGTT  
 Cucurbita pepo -----GGGAGACTTCTCATATTTTTATCTTTCTGCGGTGTGCTCTGTT  
 Lotus japonicus -----GGGGGACTTCTCATATTTAGAATCTTTCTGCGGTGTGCTCTGTT  
 Millettia pinnata -----GGGGGACTTCTCATATTTAGAATCTTTCTGCGGTGTGCTCTGTT  
 Vigna radiata -----GGGGGACTTCTCATATTTAGAATCTTTCTGCGGTGTGCTCTGTT  
 Oryza sativa Indica -----GGGGGACTTGTCTATATTTAGAATCTTTCTGCGGTCTGCTCTGTT  
 Oryza sativa Japonica -----GGGGGACTTGTCTATATTTAGAATCTTTCTGCGGTCTGCTCTGTT  
 Tripsacum dactyloides -----GGGGGACTTGTCTATATTTAGAATCTTTCTGCGGTCTGCTCTGTT  
 Zea luxurians -----GGGGGACTTGTCTATATTTAGAATCTTTCTGCGGTCTGCTCTGTT  
 Zea mays parviglumis -----GGGGGACTTGTCTATATTTAGAATCTTTCTGCGGTCTGCTCTGTT  
 Zea perennis -----GGGGGACTTGTCTATATTTAGAATCTTTCTGCGGTCTGCTCTGTT  
 Sorghum bicolor -----GGGGGACTTGTCTATATTTAGAATCTTTCTGCGGTCTGCTCTGTT  
 Cycas taitungensis -----GGGAGACTTGTCTATTTAGAATCTTTCCGCGGTGTGCTCCGTT  
\*\* \*\*\*\*\* \* \*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*

Beta macrocarpa TACTATTCTTTUGTACTTTCTTCTCTTTACC -----ACGCGATAGG  
 Beta vulgaris maritima TACTATTCTTTUGTACTTTCTTCTCTTTACC -----ACGCGATAGG  
 Silene latifolia TACTATTCTTTUGTACTTTCTTCTCTTTATC -----ACGCGATAGG  
 PB235\_ccmFc TACTATTCTTTUGTACTTTCTTCTCTTTACC -----ACGCGATAGG  
 RRIT251\_ccmFc TACTATTCTTTUGTACTTTCTTCTCTTTACC -----ACGCGATAGG  
 RRIC110\_ccmFc TACTATTCTTTUGTACTTTCTTCTCTTTACC -----ACGCGATAGG  
 BPM24\_ccmFc TACTATTCTTTUGTACTTTCTTCTCTTTACC -----ACGCGATAGG  
 RRII105\_ccmFc TACTATTCTTTUGTACTTTCTTCTCTTTACC -----ACGCGATAGG  
 RRIM600\_ccmFc TACTATTCTTTUGTACTTTCTTCTCTTTACC -----ACGCGATAGG  
 Brassica napus TACTATTCTTTUGTACTTTCU TCTTTTTAGC -----ACGCGATAGG  
 Carica papaya TACTATTCTTTTGTACTTTCTTCTTTTACC -----ACGCGATAGG  
 Citrullus lanatus TACTATTCTTTUGTACTCTTCTCTTTACC -----ACGCCATAGT  
 Cucurbita pepo TACTATTCTTTUGTACTCTTCTCTTTACC -----ACGCCATAGT  
 Lotus japonicus TACTATTCTTTUGTACTCTTCTCTTTACC -----ACGCGATAGG  
 Millettia pinnata TACTATTCTTTUGTACTCTTCTCTTTACC -----ACGCGATAGG  
 Vigna radiata TACTATTCTTTTGTACTCTTCTCTTTACC -----ACGCGATAGG  
 Oryza sativa Indica TACAATTCTTTTGTACTCTTCTCTTTACC -----ACGCGATAGG  
 Oryza sativa Japonica TACAATTCTTTUGTACTCTTCTCTTTACC -----ACGCGATAGG  
 Tripsacum dactyloides TACAATTCTTTTGTACTCTTCTCTTTACC -----ACGCGATAGG  
 Zea luxurians TACAATTCTTTTGTACTCTTCTCTTTACC -----ACGCGATAGG  
 Zea mays parviglumis TACAATTCTTTTGTACTCTTCTCTTTACC -----ACGCGATAGG  
 Zea perennis TACAATTCTTTTGTACTCTTCTCTTTACC -----ACGCGATAGG  
 Sorghum bicolor TACAATTCTTTTGTACTCTTCTCTTTACC -----ACGCGATAGG  
 Cycas taitungensis TACTATTATTTTGTACTTTTCTTACCATATAATCATGGGCGCATAGG  
\*\*\* \*\* \*\* \*\* \*\* \* \*\* \*

Beta macrocarpa TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGAGAAGGCCAAACACT  
 Beta vulgaris maritima TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGAGAAGGCCAAACACT  
 Silene latifolia TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGAAAACGCCAAACACT  
 PB235\_ccmFc TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGGAAAACGCCAAACACT  
 RRIT251\_ccmFc TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGGAAAACGCCAAACACT  
 RRIC110\_ccmFc TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGGAAAACGCCAAACACT  
 BPM24\_ccmFc TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGGAAAACGCCAAACACT  
 RRII105\_ccmFc TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGGAAAACGCCAAACACT  
 RRIM600\_ccmFc TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGGAAAACGCCAAACACT  
 Brassica napus TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGGAAAAGGCCAAACACT  
 Carica papaya TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGGAAAAGGCCAAAGACT  
 Citrullus lanatus TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGGAAAAGGCCAAACACT  
 Cucurbita pepo TCAGCGAA -----GCGTGAGCGGGCGCGGAGAAGTAAAGGCCAAACACT  
 Lotus japonicus TCAGCAAA -----GCGTGAGCGGGCGGAGAAGGAAAACGCCAAAGACT  
 Millettia pinnata TCAGCAAA -----GCGTGAGCGGGCGCGGAGAAGGAAAACGCCAAAGACT  
 Vigna radiata TCAGCAAA -----GCGTGAGCGGGCGCGGAGAAGGAAAACGCCAAACACT  
 Oryza sativa Indica TCAGCGAA -----GCGTGAGCGGGCGCTCCGAAGTAAAGGCCAAACACT  
 Oryza sativa Japonica TCAGCGAA -----GCGTGAGCGGGCGCTCCGAAGTAAAGGCCAAACACT  
 Tripsacum dactyloides TCAGCGAA -----GCGTGAGCGGGCGCTCCGAAGTAAAGGCCAAACACT  
 Zea luxurians TCAGCGAA -----GCGTGAGCGGGCGCTCCGAAGTAAAGGCCAAACACT

Zea mays parviglumis	TCAGCGAA-----GCGTGAGCGGGCGCTCCGAAGTAAAGGCCAAACACT
Zea perennis	TCAGCGAA-----GCGTGAGCGGGCGCTCCGAAGTAAAGGCCAAACACT
Sorghum bicolor	TCAGCGAA-----GCGTGAGCGGGCGCTCCGAAGTAAAGGCCAAACACT
Cycas taitungensis	TTAGCGAACAAAGGGCGTGAGCGGGCGGGAGAAGAAAACGCCAAACGCT
	* ** *

Beta macrocarpa	TCGGCCTAA-----CGGGAATGAGCAACGACGAAATGAAAAGAGAAAAGT
Beta vulgaris maritima	TCGGCCTAA-----CGGGAATGAGCAACGACGAAATGAAAAGAGAAAAGT
Silene latifolia	TCGGACTAA-----TGGGAATGAGCAACGACGAAATGACAAGATAAAAGT
PB235_ccmFc	TCCGCCTAA-----CGGGAATGAGCAACGACGAAATGACAAGATGAGGT
RRIT251_ccmFc	TCCGCCTAA-----CGGGAATGAGCAACGACGAAATGACAAGATGAGGT
RRIC110_ccmFc	TCCGCCTAA-----CGGGAATGAGCAACGACGAAATGACAAGATGAGGT
BPM24_ccmFc	TCCGCCTAA-----CGGGAATGAGCAACGACGAAATGACAAGATGAGGT
RRII105_ccmFc	TCCGCCTAA-----CGGGAATGAGCAACGACGAAATGACAAGATGAGGT
RRIM600_ccmFc	TCCGCCTAA-----CGGGAATGAGCAACGACGAAATGACAAGATGAGGT
Brassica napus	TCCGCCGAA-----CGGGAATGAGCAACGACGAAATGACAAGATGAGGT
Carica papaya	TCCGCCTAA-----CGGGAATGAGCAAGGACGAAATGACAAGATGAGGT
Citrullus lanatus	CAGGCCTAA-----CGGGAATGAGCAAGGACTCAATTCCAAGATGAGGT
Cucurbita pepo	CAGGCCTAA-----CGGGAATGAGCAAGGATGCAATGAGAAGATGAGGT
Lotus japonicus	TCCGCCTAACCTAACGGGAAT-----
Millettia pinnata	TCCGCCTAAGCCTAACGGGAATGAGCAACAACGAAATGACAAGATGGGGT
Vigna radiata	TCCGCCTAAGCCTAACGGGAATGAGCAACAACGAAATGACAAGATGGGGT
Oryza sativa Indica	TCCGCCTAA-----GGGAATGAGCAACAA---AATGACAAGATGAGGT
Oryza sativa Japonica	U <sup>T</sup> GGCCTAA-----GGGAATGAGCAACAA---AATGACAAGATGAGGT
Tripsacum dactyloides	TCCGCCTAA-----GGGAATGAGCAACAA---AATGACAAGATGAGGT
Zea luxurians	TCCGCCTAA-----GGGAATGAGCAACAA---AATGACAAGATGAGGT
Zea mays parviglumis	TCCGCCTAA-----GGGAATGAGCAACAA---AATGACAAGATGAGGT
Zea perennis	TCCGCCTAA-----GGGAATGAGCAACAA---AATGACAAGATGAGGT
Sorghum bicolor	TCCGCCTAA-----GGGAATGAGCAACAA---AATGACAAGATGAGGT
Cycas taitungensis	TCCGCCTAA-----CGGGAATGAGCAACGACGAAATGACAAGATAAGGT
	** *

Beta macrocarpa	GCCCCGGG-----CGCCCCATTTAGA-----AAGA
Beta vulgaris maritima	GCCCCGGG-----CGCCCCATTTAGA-----AAGA
Silene latifolia	GCCCCGGG-----CGCCCCATTTAGA-----AAGA
PB235_ccmFc	TTTCTTCT-----TTCCTCCATTTAGA-----AAGA
RRIT251_ccmFc	TTTCTTCT-----TTCCTCCATTTAGA-----AAGA
RRIC110_ccmFc	TTTCTTCT-----TTCCTCCATTTAGA-----AAGA
BPM24_ccmFc	TTTCTTCT-----TTCCTCCATTTAGA-----AAGA
RRII105_ccmFc	TTTCTTCT-----TTCCTCCATTTAGA-----AAGA
RRIM600_ccmFc	TTTCTTCT-----TTCCTCCATTTAGA-----AAGA
Brassica napus	GCTCCGGG-----CACCCCCATTTAGATTTAGAAAAGA
Carica papaya	GCTCTGGG-----CACCCCCATTTAGA-----AAGA
Citrullus lanatus	GCTCCGGG-----CACCCCCATTTAGA-----AAGA
Cucurbita pepo	GCTCCGGG-----CACCCCCATTTAGA-----AAGA
Lotus japonicus	-----
Millettia pinnata	GCTCCGGG-----CACCCCCATTTAGATTTAGAAAAGA
Vigna radiata	GCTCCGGG-----CACCCCCATTTAGA-----AAGA
Oryza sativa Indica	GCCCCGGG-----CACCCCCATATAGA-----AAGA
Oryza sativa Japonica	GCCCCGGG-----CACCCCCATATAGA-----AAGA
Tripsacum dactyloides	GCCCCGGG-----CACCCCCATATAGA-----AAGA
Zea luxurians	GCCCCGGG-----CACCCCCATATAGA-----AAGA
Zea mays parviglumis	GCCCCGGG-----CACCCCCATATAGA-----AAGA
Zea perennis	GCCCCGGG-----CACCCCCATATAGA-----AAGA
Sorghum bicolor	GCCCCGGG-----CACCCCCATATAGA-----AAGA
Cycas taitungensis	GCCCCGGGAGCTCGTGCCCCCCCCCACCCCCATTTAGA-----AAGA

Beta macrocarpa	AGGGTCGAAGGGTTTTGGGCCTGTAGCTTTCCCCGTCCCCCTTCGTCCGGG
Beta vulgaris maritima	AGGGTCGAAGGGTTTTGGGCCTGTAGCTTTCCCCGTCCCCCTTCGTCCGGG
Silene latifolia	AGGGTCGAAGGGTTTTGGACCTGTAGCTTTCCCCGTCCCCCTTCGTCCGGG
PB235_ccmFc	AGGGTCGAAGGGTTTTGGGCCTGTAGCTTTCCCCGTCCCCCTTCGTCCGGG













Silene latifolia  
PB235\_ccmFc  
RRIT251\_ccmFc  
RRIC110\_ccmFc  
BPM24\_ccmFc  
RRII105\_ccmFc  
RRIM600\_ccmFc  
Brassica napus  
Carica papaya  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Vigna radiata  
Oryza sativa Indica  
Oryza sativa Japonica  
Tripsacum dactyloides  
Zea luxurians  
Zea mays parviglumis  
Zea perennis  
Sorghum bicolor  
Cycas taitungensis

AGAAACAACGAGCACGACTGAAGTGGCTATCCATACAAATCUATTTACGG  
AGAAACGACGAGCACGACTGAAGTGGCTATACATACAAATCTATTTACGG  
AGAAACGACGAGCACGACTGAAGTGGCTATACATACAAATCTATTTACGG  
AGAAACGACGAGCACGACTGAAGTGGCTATACATACAAATCTATTTACGG  
AGAAACGACGAGCACGACTGAAGTGGCTATACATACAAATCTATTTACGG  
AGAAACGACGAGCACGACTGAAGTGGCTATACATACAAATCTATTTACGG  
AGAAACGACGAGCACGACTGAAGTGGCTATACATACAAATCTATTTACGG  
AGAAAGGACGAGCACGGCTGAAGTGGCTATACATACAAATCTATTTACGG  
AGAAAGGATGAGCACGACTGAAGTGGCTATACATACAAATCTATTTACGG  
AGAAACGACGAGCACGACTGAAGTAGCTATACATACAAATCUATTTACGG  
AGAAAGGACGAGCACGACTGAAGTAGCTATACATACTAAATCUATTTACAG  
AGAAACAACGAGCACGACTGAAGTGGCTATACATACAAATCUATTTACGG  
AGAAACAACGAGCACGACTGAAGTGGCTATACATACAAATCUATTTACGG  
AGAAACAACGAGCACGACTGAAGTGGCTATACATACAAATCCATTTACGG  
AGAAACGAGGAGCACGACTGAAGTGGCTATACATACAAATCCATTTACGG  
AGAAACGAGGAGCACGACTGAAGTGGCTATACATACAAATCUATTTACGG  
AGAAACGAGGAGCACGACTGAAGTGGCTATACATACAAATCCATTTACGG  
AGAAACGAGGAGCACGACTGAAGTGGCTATACATACAAATCCATTGACGG  
AGAAACGAGGAGCACGACTGAAGTGGCTATACATACAAATCCATTGACGG  
AGAAACGAGGAGCACGACTGAAGTGGCTATACATACAAATCCATTGACGG  
AGAAACGAGGAGCACGACTGAAGTGGCTATACATACAAATCCATTTACGG  
GAAACGACGAGCGCAGCTGAAGTTGCTATACATACAAATCTATTTACGG  
\*\*\*\* \* \*\*\*\* \*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\* \*\* \*\* \*

Beta macrocarpa  
Beta vulgaris maritima  
Silene latifolia  
PB235\_ccmFc  
RRIT251\_ccmFc  
RRIC110\_ccmFc  
BPM24\_ccmFc  
RRII105\_ccmFc  
RRIM600\_ccmFc  
Brassica napus  
Carica papaya  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Vigna radiata  
Oryza sativa Indica  
Oryza sativa Japonica  
Tripsacum dactyloides  
Zea luxurians  
Zea mays parviglumis  
Zea perennis  
Sorghum bicolor  
Cycas taitungensis

ATCTATATGCTTUGATTGGAAGTCAAGAACAGGCGGCTGGTAT  
ATCTATATGCTTUGATTGGAAGTCAAGAACAGGCGGCTGGTAT  
ATCTATATGCTTUGATTGGAAGTCAAGAACAGGCGGCTGGTAT  
ATCTATATGCTTCGATTGGAAGTCCAGAACAGGCGGCTGGTAT  
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ATCTATATGCTTUGATTGGAAGTCCAGAACAGGCGGCTGGTAT  
ATAGATATGCTTUGATTGGAAGTCCAGAACAGGCGGCTGGTAT  
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ATAGATATGCTTUGATTGGAAGTCCAGAACAGGCGGCTGGTAT  
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ATCTATATGCTCCGATTGGAAGTCCAGAACAGGCGGCTGGTAT  
ATCTATATGCTCCGATTGGAAGTCCAGAACAGGCGGCTGGTAT  
ATCTATATGCTCCGATTGGAAGTCCAGAACAGGCGGCTGGTAT  
ATCCATATGCTCCGATTGGAAGTCCAGAACAGGCGGCTGGTAT  
\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\* \*\* \*\* \*\*\*\*\*

Beta macrocarpa  
Beta vulgaris maritima  
Silene latifolia  
PB235\_ccmFc  
RRIT251\_ccmFc  
RRIC110\_ccmFc  
BPM24\_ccmFc  
RRII105\_ccmFc  
RRIM600\_ccmFc  
Brassica napus  
Carica papaya  
Citrullus lanatus

ACTACCATAATGAACTGCCTTTTCTTTTTTTTATTUGGATAGGATTTCT  
ACTACCATAATGAACTGCCTTTTCTTTTTTTTATTUGGATAGGATTTCT  
ACTACTATAATGAACTGCCTTTTATTTTTTTTATTUGGATAGGATTTCT  
ACCACCATAATGAACTGCCTTTTATTTTTTTTATTCGGATAGGATTTAT  
ACCACCATAATGAACTGCCTTTTATTTTTTTTATTCGGATAGGATTTAT  
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ACCACCATAATGAACTGCCTTTTATTTTTTTTATTCGGATAGGATTTAT  
ACCACCATAATGAACTGCCTTTTATTTTTTTTATTUGGATAGGATTTAT  
ACCACCATAATGAACTGCCTTTTCTTTTTTTGATTTCGGATAGGATTTAT  
ACCACCATAATGAACTGCCTTTTATTTTTTTTATTCGGATAGGATTTCT



Sorghum bicolor  
Cycas taitungensis

ATAAGTTGCATTGGAATUGA-----  
ATAAGTTGCATTGGAATUGA-----

#####

**cob multiple sequence alignment**

```
Arabidopsis thaliana      -- -- CAAAAGTGTGTAGGAGAAAGAATT -- CTAAAAACGTCGACGCTTA --
Brassica napus           GGGCAAAGGTGTGTAGGAGAAAGAATT -- CTAAAAACGTCGACGCTTA --
PB235_cob                -----
Lotus japonicus          -----GTAACCCAGGATGACCC -- CTTCGACGCTCGCTTCTTTTCG
Millettia pinnata       -----CCGTAACCCAGG-----CC -- CTTCGACGCTCGCTTCTTTTCG
BPM24_cob                -----
Citruillus lanatus      -----GGAAAAACCAACGCAAATA -- TCATATTGACTTTTCTCTC ---
Cucurbita pepo          -----TGGAAAAACCAAGGCAAATA -- TCATATAGACTTTTCTCTC ---
RRII105_cob             -----
Beta macrocarpa         -----AGGTAATTCCTATTTTAAAT
Beta vulgaris vulgaris  -----AGGTAATTCCTATTTTAAAT
Beta vulgaris maritima  -----AGGTAATTCCTATTTTAAAT
RRIT251_cob             -----
Silene latifolia        -----TCTCCG -- ATATGCAAGGGGTGTCGTCTG
RRIM600_cob             -----
RRIC110_cob             -----
Oryza sativa Japonica   -----TCGAGAATCAACTAACCGACAAATCCGTAGCCCAGG
Megaceros aenigmaticus -----
```

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Arabidopsis thaliana      -- -- ATTCGCCCCCTCCAT --- CCTTCAAAGTAAAAGAAAGGCTCAAATAT
Brassica napus           -- -- ATTCGCCCCCGAGGAATGCTTTCAAAGTCAAAGAAAGGCTCAAATAT
PB235_cob                -----
Lotus japonicus          CTGTATACCCCCTCCAT --- CCTTCGGAGGT --- GGAAGAAAGAAAAGG
Millettia pinnata       CTGTATACCCCCTCAAT --- CCTTCGGAGGTAGGTGGAAGAAAGAAAAGG
BPM24_cob                -----
Citruillus lanatus      -- -- GCCCTACTTCTCAGT --- CTCGATAGAAAAGGTTGGAGAGAGTGACTT
Cucurbita pepo          -- -- GCCCTACTTCTCAGT --- CTCGATAGAAAAGGTTGGAGAGAGTGACTT
RRII105_cob             -----
Beta macrocarpa         ACTTGAACAAGTAAGGGTCCAGATCATTCCATTGGGGAGAAAGCAGGAG
Beta vulgaris vulgaris  ACTTGAACAAGTAAGGGTCCAGATCATTCCATTGGGGAGAAAGCAGGAG
Beta vulgaris maritima  ACTTGAACAAGTAAGGGTCCAGATCATTCCATTGGGGAGAAAGCAGGAG
RRIT251_cob             -----
Silene latifolia        GTATAGAACCAGAACTTGGGCGGAGGTAGTTGTTTTCCAGTAGCCAGAAC
RRIM600_cob             -----
RRIC110_cob             -----
Oryza sativa Japonica   TGATTCGCTGCCTCCCT --- CTCGCCAAAATGGGATGAATCTTCTCATGC
Megaceros aenigmaticus -----
```

```
Arabidopsis thaliana      CAATATTATATATATATTTGAG --- GATATTTTAGGGCCCT --- AGAAC
Brassica napus           CAA --- TATATATATTTTAG --- GATATTTTAGGGCCCT --- AGAAC
PB235_cob                -----
Lotus japonicus          TACTAAAATATATATATATT --- TTATTTTAGTAGGGCCCC --- AGAAC
Millettia pinnata       TACTATAAATAATAAATAATGGATTCTTTTTTTTAGGGCCCC --- AGAAC
BPM24_cob                -----
Citruillus lanatus      TATGAAATTCTCTCCTTTCTAAAGCAGCGCAAGGCGGCCCCCCCAGAAC
Cucurbita pepo          TATGAAATTCTCTCCTTTCTAAAGCAGCGAAAGGCGGCCCCCCC --- AGAAC
RRII105_cob             -----
Beta macrocarpa         TCATCCATATATAGATGAATAGTACCAAGTGGCGTCTAGGAGGAAGACGGG
Beta vulgaris vulgaris  TCATCCATATATAGATGAATAGTACCAAGTGGCGTCTAGGAGGAAGACGGG
Beta vulgaris maritima  TCATCCATATATAGATGAATAGTACCAAGTGGCGTCTAGGAGGAAGACGGG
RRIT251_cob             -----
Silene latifolia        T -- TTCTTTCTGTTGTAGGGT - CTATAAACCCATAG --- AGAGGTG
RRIM600_cob             -----
RRIC110_cob             -----
```

Oryza sativa Japonica  
Megaceros aenigmaticus

AGCTT--TTTTCTTGTTCAAGGCGCAGCGAAGCCAATTTCCATCAAGGCA

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citrullus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

GCAAAAAAAGGTGGGTGAACAAGAGTTGTCACGATAGGAAAGAGAAA--  
GCAAAAAAAG-TGGGTGAACAAGAGTTGTCACGATAGGAAAGAGAAA--  
-----A--  
G-AAAAAAAAGGTGGGGGAACCAGAGTTGTCACGATAGGAAAGATAAAAA  
G-AAAAAAA-GGTGGGGGAACCAGAGTTGTCACGATAGGAAAGAGAAAA  
-----  
GCTAAAAA--GGTGGGGGAACAAGAGTTGTCACGATAGGAAAGAGAAA--  
GCTAAAAA--GGTGGGGGAACAAGAGTTGTCACGATAGGAAAGAGAAA--  
-----A--  
GAGTGACTGGGGTGGG-GAAGAAGAGTTGTCACGATAGAAAGAATCTTGG  
GAGTGACTGGGGTGGG-GAAGAAGAGTTGTCACGATAGAAAGAATCTTGG  
GAGTGACTGGGGTGGG-GAAGAAGAGTTGTCACGATAGAAAGAATCTTGG  
-----  
GTTTTTCTGGGGTGGG-GAAGAAGAATTGTAACGATAGAAAAAGTCTTCG  
-----  
AGGGGGTAAATAAGGGGGGAAGAGGAGTTGTCACGATAGAAAGAGAAA--  
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Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citrullus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

-----TGACTA-----TAAGGAACCAACGATTCTCTTTCTTAAACAAC  
-----TGACTA-----TAAGGAACCAUCGATTCTCTTTCTTAAACAAC  
-----TGACTA-----TAAGGAACCAACGATTCTCTTTCTTAAACAAC  
ATAAATGACTAGCGGAATAAGGAACCAACGACTCTCTATTCTAAAACAAC  
A---ATGACTA-----TAAGGAACCAACGATTCTCTTTCTTAAACAAC  
----ATGACTA-----TAAGGAACCAACGATTCTCTTTCTTAAACAAC  
-----TGACTA-----AAAGAAACCAACGATTCTCTTTCTTAAACAAC  
-----TGACTA-----AAAGAAACCAACGATTCTCTTTCTTAAACAAC  
-----TGACTA-----TAAGGAACCAACGATTCTCTTTCTTAAACAAC  
CAAAGCAAATGA--GTCTAAGAAACCAACGATTCTCTGTTCTTAAACAAC  
CAAAGCAAATGA--GTCTAAGAAACCAACGATTCTCTGTTCTTAAACAAC  
CAAAGCAAATGA--GTCTAAGAAACCAACGATTCTCTGTTCTTAAACAAC  
-----ATGA--CTATAAGGAACCAACGATTCTCTTTCTTAAACAAC  
CAAAGCAAATGA--GTATAAGGAACCAACGATTCTCTGTTCTTAAACAAC  
-----ATGA--CTATAAGGAACCAACGATTCTCTTTCTTAAACAAC  
----ATGACTA-----TAAGGAACCAACGATTCTCTTTCTTAAACAAC  
-----TGACTA-----TAAGGAACCAACGATTCTCTTTCTTAAACAAC  
-----  
\* UGGCAAGACGACTTTCGATTCTTAAACAAC  
\* \*\* \* \*\* \* \*\* \* \*\* \*

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citrullus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

CTATATCCTCCACACTTAATCAGCATTTAGTAGATTATCCAACCCCGAGC  
CTATATCCTCCACACTTAATCAGCATTTAGTAGATTATCCAACCCCGAGC  
CTATATCCTCCACACTTAATCAGCATTTGATAGATTATCCAACCCCGAGC  
CTATATCCTCCACACTTAATCAACATTTGATAGATTATCCAACCCCGAGC  
CTATATCCTCCACACTTAATCAACATTTGATAGATTATCCAACCCCGAGC  
CTATATCCTCCACACTTAATCAGCATTTGATAGATTATCCAACCCCGAGC  
CTATATCCTCCACACTGAATCAGCATTTGATAGATTATCCAACCCCGAGT  
CTATATCCTCCACACTTAATCAGCATTTGATAGATTATCCAACCCCGAGC  
UATATTTTCCACACTTAATCAGCATTTGATAGATTATCCAACCCCGAGC  
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CTATATCCTCCACACTTAATCAGCATTTGATAGATTATCCAACCCCGAGC  
CTATATACTCCACACTTAACCAGCATTTGATAGATTATCCAACTCCGAGC  
CTATATTTTCTACAGTTAAACATTCATTCGATAGACTATCCAACTCTAAGC

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Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citruillus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

AATCTTAGTTATTGGTGGGGGTTCCGGTCCGTTAGCTGGTATTTGTTTAGT  
AATCTTAGTTATTGGTGGGGGTTCCGGTCCGTTAGCTGGTATTTGTTTAGT  
AATCTTAGTTATTGGTGGGGGTTCCGGTUCGTTAGCTGGTATTTGTTTAGT  
AATCTTAGTTATTGGTGGGGGTTCCGGTTCGTTAGCTGGTATTTGTTTAGT  
AATCTTAGTTATTGGTGGGGGTTCCGGTUCGTTAGCTGGTATTTGTTTAGT  
AATCTTAGTTATTGGTGGGGGTTCCGGTUCGTTAGCAGTCTTTGTTTAGT  
AATCTTAGTTATTGGTGGGGGTTCCGGTUCGTTAGCAGTCTTTGTTTAGT  
AATCTTAGTTATTGGTGGGGGTTCCGGTUCGTTAGCTGGTATTTGTTTAGT  
AATATTAGTTATTGGTGGGGATTCCGGTTCGTTAGCTGGGATTTGTTTAGT  
AATATTAGTTATTGGTGGGGATTCCGGTTCGTTAGCTGGGATTTGTTTAGT  
AATATTAGTTATTGGTGGGGATTCCGGTTCGTTAGCTGGGATTTGTTTAGT  
AATCTTAGTTATTGGTGGGGGTTCCGGTUCGTTAGCTGGTATTTGTTTAGT  
AATATTAGTTATTGGTGGGGATTCCGGTTCGTTAGCTGGGATTTGTTTAGT  
AATCTTAGTTATTGGTGGGGGTTCCGGTNCGTTAGCTGGTATTTGTTTAGT  
AATCTTAGTTATTGGTGGGGGTTCCGGTUCGTTAGCTGGTATTTGTTTAGT  
AATCTTAGTTATTGGTGGGGGTTCCGGTTCGTTAGCAGTATTTGTTTAGT  
AATTTAAGTTATTGGTGGGGTTTTGGTTCGTTGGCTGCTATTCGTTTGGT  
\*\*\* \* \*\*\*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\*

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citruillus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATTACACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATTACACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATUACACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATTACACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATTACACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATUACACACCTCATG  
CATTCAGATAGTTACTGGCGTTTTTTTAGCTATGCATTACACACCTCATG  
CATTCAGATAGTTACTGGCGTTTTTTTAGCTATGCATTACACCCCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATUACACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATTATACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATTATACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATTATACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATUACACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATNACACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATUACACACCTCATG  
CATTCAGATAGTGACTGGCGTTTTTTTAGCTATGCATUACACACCTCATG  
TACTCAGATAATTACAGGTGTTTCCTTAGCTATGCATCATAACACCTCATG  
\* \*\*\*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\*

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citruillus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

TGGATTTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATTTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACGTTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACGTTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCAACAGCGTAGAACACATTATGAGAGATGTTGAAGGG  
TGGATCTAGCTTTCTAAGTGTAGAACACATAATGAGAGATGTTGAAGGG  
\*\*\*\*\* \*\*\*\*\* \* \*\* \*\*\*\*\* \* \*\*\*\*\* \*\*\*\*\*

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citruillus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTTAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTTAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTGCTCCGTTATATGCATGCTAATGGGGCAAGTATGTTTUTCAT  
GGCTGGTTACTTCGTTACATGCATGCTAATGGTGCCAGTATGTTCTTTAT  
\*\*\*\*\* \*\* \*\*\*\*\* \*\*\*\*\* \*\* \*\*\*\*\* \* \*\*

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citruillus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

TGTGGTTACCTTCATATTTTTTCGTGGTCTATATUATGCGAGTTATAGCA  
TGTGGTTACCTTCATATTTTTTCGTGGTCTATATUATGCGAGTTATAGCA  
TGTGGTTACCTTCATATTTTTTCGCGGTCTATATUATGCGAGTTATAGCA  
TGTGGTTUACCTTCATATTTTTTCGTGGTCTATATUATGCGAGTTATAGCA  
TGTGGTTUACCTTCATATTTTTTCGTGGTCTATATUATGCGAGTTATAGCA  
TGTGGTTUACCTTCATATTTTTTCGCGGTCTATATUATGCGAGTTATAGCA  
TGTGGTTUACCTTCATATTTTTTCGTGGTCTATATUATGCGAGTTATAGCA  
TGTGGTTUACCTTCATATTTTTTCGTGGTCTATATUATGCGAGTTATAGCA  
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TGTGGTTUACCTTCATATTTTTTCGTGGTCTATATUATGCGAGTTATAGCA  
TGTGGTTUACCTTCATATTTTTTCGTGGTCTATATUATGCGAGTTATAGCA  
TGTGGTTUACCTTCATATTTTTTCGCGGTCTATATUATGCGAGTTATAGCA  
TGTGGTTUACCTTCATATTTTTTCGCGGTCTATATNATGCGAGTTATAGCA  
TGTGGTTUACCTTCATATTTTTTCGCGGTCTATATNATGCGAGTTATAGCA  
TGTGGTTUACCTTCATATTTTTTCGTGGTCTATATUATGCGAGTTATAGCA  
TGTGGTTUACCTTCATATTTTTTCGTGGTCTATATUATGCGAGTTATAGCA  
TACGGTTATCTTCATATCTTCGTGGTTTATATTATGGAAGTTATGCCA  
\* \*\*\*\* \* \*\*\*\*\* \*\*\*\*\* \*\* \*\*\*\*\* \* \*\*

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citruillus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

GTCCTAGGGAATTTGTTTGGTGTCTTGGAGTTGTAATCTTCCTATTAATG  
GTCCTAGGGAATTTGTTTGGTGTCTTGGAGTTGTAATCTTCCTATTAATG  
GTCCTAGGGAATTTGTTTGGTGTCTCGGAGTTGTAATCTTCCTATTAATG  
GTCCTAGGGAATTTGTTTGGTGTCTCGGAGTTGTAATCTTCCTATTAATG  
GTCCTAGGGAATTTGTTTGGTGTCTCGGAGTTGTAATCTTCCTATTAATG  
GTCCTAGGGAATTTGTTTGGTGTCTCGGAGTTGTAATCTTCCTATTAATG  
GTCCTAGGGAATTTGTTTGGTGTCTCGGAGTTGTAATCTTCCTATTAATG  
GTCCTAGGGAATTTGTTTGGTGTCTCGGAGTTGTAATCTTCCTATTAATG  
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GTCCTAGGGAATTTGTTTGGTGTCTCGGAGTTGTAATCTTCCTATTAATG  
GTCCTAGGGAATTTGTTTGGTGTCTCGGAGTTGTAATCTTCCTATTAATG  
GTCCTAGGGAATTTGTTTGGTGTCTCGGAGTTGTAATCTTCCTATTAATG  
GTCCTAGGGAATTTGTTTGGTGTCTCGGAGTTGTAATCTTCCTATTAATG  
\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \* \* \* \* \* \*\*\*\*\*

Arabidopsis thaliana  
Brassica napus

ATTGTGACAGCTTTTATAGGATATGTAACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATATGTAACCTTGGGGTCAGATGAGCTT

PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citruillus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTAUAGGATACGTACUACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTAUAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTAUAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTGTGACAGCTTTTATAGGATACGTACTACCTTGGGGTCAGATGAGCTT  
ATTATAACAGCTTTTATAGGCTACGTACTACCTCGGGGTCAAATGAGCTT  
\*\*\* \* \*\*\*\*\* \*\* \*\* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \*

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citruillus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCCATACCTGTAGTAG  
TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCCATACCTGTAGTAG  
TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCCATACCTGTAGTAG  
TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCCATACCTGTAGTAG  
TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCCATACCTGTAGTAG  
TTGGGGAGCAACTGTAATTACAAGCTTAGCTAGCGCCATACCCGTAGTAG  
TTGGGGAGCAACTGTAATTACAAGCTTAGCTAGCGCCATACCCGTAGTAG  
TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCCATACCTGTAGTAG  
TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCTATACCTGTAGTAG  
TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCTATACCTGTAGTAG  
TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCTATACCTGTAGTAG  
TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCTATACCTGTAGTAG  
TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCCATACCTGTAGTAG  
TTGGGGAGCTACAGTAATTACAAGCTTAGCTAGCGCCATACCTGTAGTAG  
TTGGGGAGCAACAGTAATTACAAGCTTAGCTAGCGCCATACCCGTAGTAG  
TTGGGGAGCAACGTAATTACAAGCTTAGCTAGCGCCATACCTGTAGTAG  
\*\*\*\*\* \* \* \*\*\*\*\* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \*

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citruillus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
GAGATACCATAGTGACTTGGCTTTGGGGTGGTTTCTCCGTGGACAATGCC  
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GAGACTATAGTAACCTCGCTTTGGGGTGGCTTTCCCGTAGACAATGCT  
\*\*\*\* \* \*\*\*\*\* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \*

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus

ACCTTAAATCGTTTTTTTGTCTTCATUATTTACTCCCCTTTATTTTAGT  
ACCTTAAATCGTTTTTTTGTCTTCATUATTTACTCCCCTTTATTTTAGT  
ACCTTAAATCGTTTTTTTGTCTTCATUATTTACTCCCCTTTATTTTAGT  
ACCTTAAATCGTTTTTTTGTCTTCATUATTTACTCCCCTTTATTTTAGT











RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

GGAATTC-CTAATTCTTACACGGATGAGACTGATCACACCTGA-----  
AGAATTC-CTAATTCTTACAUGGATGAGACTGATCACACCTGAATTTAA  
GGAATTC-CTAATTCTTACACGGATGAGACTGATCACACCTGA-----  
GGAATTC-CTAATTCTTACACGGATGAGACTGATCACACCTGA-----  
GGAATTC-CAAAATATTACACGGATGAGACTCATCGACCAGGATCAGTCT  
CAGATTAATCAATACTTCAAGCGGGGAAGGTAAGCTTCCC-----  
\*\* \*\* \* \* \*\* \*

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citrullus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

CTGATCAGTGAAAAATTCTGA-CACCAATCATT-----TACATATTACA  
CTGATCAGTGAAAAATTTTGA-CACCAATCATT-----TACATATTACA  
CTGA-----  
-----GTGAAAAATTCTGA-CCCAATCATT-----TACGTATTACA  
-----GTGAAAAATTCTGA-CACCAATCATT-----TACGTATTACA  
-----CACCTGA-----  
CTAATCAGTGAAAAATTCTGA-CACAAATCATTGTAGAGTGAGTATTACA  
CTAATCAGTGCAAAATTCTGA-CACAAATCATTGTAGAGTTAGTATTACA  
CTGA-----  
-----AGTGAAAAATTCTTA-CACCAAGAATTGACGAGTGAGTATTACA  
-----AGTGAAAAATTCTTA-CACCAAGAATTGACGAGTGAGTATTACA  
-----AGTGAAAAATTCTTA-CACCAAGAATTGACGAGTGAGTATTACA  
-----  
TTTAA-AATTAATAATTATTA-CACCAAGAATTGACGAGTGAGTCTTACA  
-----  
-----  
CTTA--GACGGATGAGACTGATCACACCTGATCAGTGATCAATTCTGGCA  
-----TGCTTCTTCGTACCACCAGT-ATTATGTATGCGATTTCTGTC

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citrullus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia  
RRIM600\_cob  
RRIC110\_cob  
Oryza sativa Japonica  
Megaceros aenigmaticus

CCAAGAATT---GACAAGCAGATAAGT--TTTCTAGTTTGCTATGTTGA  
CCAAGAATT---GACAAGCGGATAAGT--TTTCTAGTTTGCTATGTTGA  
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CCAAGAATTCATTGACAAGCAAATGAAT--TGGCTATGTTG-TCCGTCGG  
CCAAGAATTAATTGACAAGCGCATTAGT--T--TTATGGC--TATGTTGA  
-----  
CCAAGAATTCATTGACAAGCGGAT-----TTTCTAGTTGGCTTTGTTGA  
CCAAGAATGAATTGACAAGCAGAT-----TTTCTAGTTGGCTTTGTTGA  
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CCAAGAATT---GACAAGCGGATTCGTTTTTTCTAGTTGGCTATGTTGA  
CCAAGAATT---GACAAGCGGATTCGTTTTTTCTAGTTGGCTATGTTGA  
CCAAGAATT---GACAAGCGGATTCGTTTTTTCTAGTTGGCTATGTTGA  
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CCAAGAATT---GACAAGCGGATTCGTTTTTTCTAGTTGGCTATAAGGG  
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CAATGAATT---TACGAGTTATTTTACACAATGAATTTA--CAAGCAGA  
CCTCGGTTGA-----

Arabidopsis thaliana  
Brassica napus  
PB235\_cob  
Lotus japonicus  
Millettia pinnata  
BPM24\_cob  
Citrullus lanatus  
Cucurbita pepo  
RRII105\_cob  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
RRIT251\_cob  
Silene latifolia

TATAGCTTAGATAGGGAAAAGA---TAACT--CCACTATAGA-GTAGGG  
TATAGCTTAGATAGGGAAAAGA---TAACT--CCACTATAGG-GTAGGG  
-----  
TGC-GCTCATTCCGCCGATTT---TTTTTTACCAGGACAGGAGTCAAA  
TATAGCTTAGAAAAGGGAAAAG-----AGAGTGACAGAAGTCAAA  
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TATAGCTTAGATAGGGAAAAGA---T-----ACGAGAGG-GTAGGG  
TATAGCTTAGATAGGGAAAAGA---T-----ACGAGAGG-GTAGGG  
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TATAGCTTAGATAGGGAAAAGAAAGTCTACTATAGGGTAAGGGTGAAGTCTT  
TATAGCTTAGATAGGGAAAAGAAAGTCTACTATAGGGTAAGGGTGAAGTCTT  
TATAGCTTAGATAGGGAAAAGAAAGTCTACTATAGGGTAAGGGTGAAGTCTT  
-----  
-ATGCCTAAAAAAGCCTAGCG-----CTGATAAAGGTAATTGAT--ATTT

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RRIM600_cob -----
RRIC110_cob -----
Oryza sativa Japonica TG-AGTTTGCAACGGTAGACCTA--TCTCCTGAAAAGAGTTCAGTAAACA
Megaceros aenigmaticus -----

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Arabidopsis thaliana CTGTA CTGACTTCAAAAATCAAAAAGGGTCCCTCTCCCCCTTTTTTTTATTAATA
Brassica napus CTGTA CTGACTTCAAAAATCAAAAAGGGTCCCTCTCCCCCTTTTTT-ATTAATA
PB235_cob -----
Lotus japonicus GAAGAGCGGATCCAAGACCAAGACGACTTCTTTAGAAAAGAAGGGCAGAAA
Millettia pinnata AAATGACCTAAACACCCTTAAGAATCCATAGGGAATAAATAGGGACGTGA
BPM24_cob -----
Citrullus lanatus CTGAACTTTGAA-ATCCGGGGGCTTTGTTC-----
Cucurbita pepo CTGCACTTTGAA-ATCCGGGGGCTTTGTTA-----
RRII105_cob -----
Beta macrocarpa TCAAATCCGGTTGTTCCCGAAACTCCCCGTCCTTAC-----
Beta vulgaris vulgaris TCAAATCCGGTTGTTCCCGAAACTCCCCGTCCTTAC-----
Beta vulgaris maritima TCAAATCCGGTTGTTCCCGAAACTCCCCGTCCTTAC-----
RRIT251_cob -----
Silene latifolia AAGCATACCGCTTACCAAGAACAGTTTCTTTCTTC-----
RRIM600_cob -----
RRIC110_cob -----
Oryza sativa Japonica AGGGAACGAAGCGACCGATAACGTCCCCTCGGGGAGGAGTGTTTTA----
Megaceros aenigmaticus -----

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Arabidopsis thaliana -----
Brassica napus A-----
PB235_cob -----
Lotus japonicus ATCCA-----
Millettia pinnata GTCCCCCTCTC
BPM24_cob -----
Citrullus lanatus -----
Cucurbita pepo -----
RRII105_cob -----
Beta macrocarpa -----
Beta vulgaris vulgaris -----
Beta vulgaris maritima -----
RRIT251_cob -----
Silene latifolia -----
RRIM600_cob -----
RRIC110_cob -----
Oryza sativa Japonica -----
Megaceros aenigmaticus -----

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**cox1 multiple sequence alignment**

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Brassica napus CAAATTT---ATGAAAAATCTGGTTC---GATGGCTGTTCTCCACAAACC
PB235_cox1 -----ATGACAAATCTGGTUC---GATGGCTGTTCTCCACTAACC
Citrullus lanatus -----ACGACAAATCUGGTCC---GATGGCTGTTCTCCACTAACC
BPM24_cox1 -----ATGACAAATCTGGTUC---GATGGCTGTTCTCCACTAACC
RRIC110_cox1 -----ATGACAAATCTGGTUC---GATGGCTGTTCTCCACTAACC
Cucurbita pepo -----ACGAGAAATCTGGTCC---GATGGCTGTTCTCCACTAACC
Lotus japonicus -----ATGACAAATCUGGTUC---GATGGCTGTTCTCCACTAACC
Millettia pinnata -----ATGACAAATCUGGTUC---GATGGCTGTTCTCCACTAACC
RRIT251_cox1 -----ATGACAAATCTGGTUC---GATGGCTGTTCTCCACTAACC
Oryza sativa Japonica AAATCAA---ATGACAAATCTGGTCC---GATGGCTCTTCTCCACTAACC
RRIM600_cox1 -----ATGACAAATCTGGTUC---GATGGCTGTTCTCCACTAACC
RRII105_cox1 -----ATGACAAATCTGGTUC---GATGGCTGTTCTCCACTAACC
Cycas taitungensis TAATCTT---AUGACAAATTTGGTCC---GATGGCCGTTCCCCACCAACC
Megaceros aenigmaticus -----ATGAAAAATTTTGCACAAAGATGGCTTTTTTCCACAAACC

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RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

CTCACGCTTTTTTAATGATCTTTTTTATGGTTATGCCGGCGATGATAGGT  
CTCACGCTTTTTTAATGATCTTTTTTATGGTTATGCCGGCGATGATAGGT  
CTCACGCTTTTTTAATGATCTTTTTTATGGTTATGCCGGCGATGATAGGT  
CTCACGCTTTTTTAATGATCTTTTTTATGGTTATGCCGGCGATGATAGGT  
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CTCACGCTTTTTTAATGATATCTTTTTATGGTTACGCCCTGCCATGATAGGT  
CTTACGTTTTTTAATGATATTTTTTATGGTTATGCTTGCCATGATAGGT  
\*\* \* \* \*\* \*\*\*\*\* \* \*\*\*\*\* \* \*\* \*\* \*\*\*\*\*

Brassica napus  
PB235\_cox1  
Citruillus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

GGATTTGGTAATTGGTTTGTCCGATTCTGATAGGTGCACCTGACATGGC  
GGATUTGGTAATTGGTUTGTTCCGATTCTGATAGGTGCACCTGACATGGC  
GGATUTGGTAATTGGTUTGTTCCGATTCTGATAGGTGCACCTGACATGGC  
GGATUTGGTAATTGGTUTGTTCCGATTCTGATAGGTGCACCTGACATGGC  
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GGATTTGGTAATTGGTTTGTCCGATTCTCATAGGTGCACCTGACATGGC  
GGATTTGGTAATTGGTTTGTCCGATTCTTATAGGTGCACCTGACATGGC  
\*\*\*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\*\*\*\*

Brassica napus  
PB235\_cox1  
Citruillus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

ATTTCCACGATTAATAATATTTTCACTTCTGGTTGTTGCCACCAAGTCTCT  
ATTTCCACGATTAATAATATTTTCACTTCTGGTTGTTGCCACCAAGTCTCT  
ATTTCCACGATTAATAATATTTTCACTTCTGGTTGTTGCCACCAAGTCTCT  
ATTTCCACGATTAATAATATTTTCACTTCTGGTTGTTGCCACCAAGTCTCT  
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ATTTCCACGATTAATAATATTTTCACTTCTGGTTGTTGCCACCAAGTCTCT  
ATTTCCACGATTAATAATATTTTCACTTCTGGTTGTTGCCACCAAGTCTCT  
ATTTCCACGATTAATAATATCTCATTCCGGTTGCTGCCACCTTCGCTGT  
ATTTCCACGATTGAATAATATCAGTTCTTGGCTATTACCGCCGCTACTGC  
ATTTTTACGATTGAATAATATCAGTTTTTGGCTATTACCGCCGCTACTGC  
\*\*\*\* \*\*\*\*\* \* \*\* \* \* \* \* \*

Brassica napus  
PB235\_cox1  
Citruillus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

TGCTCCTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TACTCNTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TGCTCCTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TACTCNTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TGCTCCTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TGCTCCTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TGCTCCTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TACTCCTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TACTCCTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TACTCCTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TACTCCTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TGCTCCTATTAAGCTCAGCCTTAGTAGAAGTAGGTAGCGGCACTGGGTGG  
TACTTTCTTTAAGCTCCTGCTTTGGTAGAAGTTGGCGCAGGTACCGGCTGG  
TACTTTCTTTAAGTTCCGCTTTGGTAGAAGTTGGCGCAGGTACTGGCTGG  
\* \*\* \* \*\*\*\*\* \* \*\* \* \*\* \*\*\*\*\* \* \*\* \*\* \*\* \*\* \*\* \*\* \*\* \*\*

Brassica napus  
PB235\_cox1

ACGGTCTATCCGCCCTTAAGTGGTATTACCAAGTCTTCTGGAGGAGCAGT  
ACGGTCTATCCGCCCTTAAGTGGTATTACCAAGTCTTCTGGAGGAGCAGT





Megaceros aenigmaticus  
Phaeoceros laevis

ACTATGCATAAATTGCCTTTATTTGTGTGGCCTGTTTTAGTGACAGCATT  
ACTATGCATAAATTGCCTTTATTTGTGTGGTTCGTTTTAGTGACAGCATT  
\*\*\*\*\* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \*

Brassica napus  
PB235\_cox1  
Citruŕllus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Milletia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

CCTACTTTTATTATCACTCCCGTACTGGCAGGGGCAATTACCATGTTAT  
CCUACTTTTATTATCACTTCCGGTACTGGCAGGGGCAATTACCATGTTAT  
CCUACTTTTATTATCACTTCCGGTACTGGCAGGGGCAATTACCATGTTAT  
CCUACTTTTATTATCACTTCCGGTACTGGCAGGGGCAATTACCATGTTAT  
CCUACTTTTATTATCACTTCCGGTACTGGCAGGGGCAATTACCATGTTAT  
CCUACTTTTATTATCACTTCCGGTACTGGCAGGGGCAATTACCATGTTAT  
CCUACTTTTATTATCACTTCCGGTACTGGCAGGGGCAATTACCATGTTAT  
CCUACTTTTATTATCACTTCCGGTACTGGCAGGGGCAATTACCATGTTAT  
CCTACTTTTATTATCACTTCCGGTACTGGCAGGGGCAATTACAATGTTAT  
CCUACTTTTATTATCACTTCCGGTACTGGCAGGGGCAATTACCATGTTAT  
CCUACTTTTATTATCACTTCCGGTACTGGCAGGGGCAATTACCATGTTAT  
CCUACTTTTATTATCACTTCCGGTACTGGCAGGGGCAATTACCATGTTAT  
CCTACTTCTATTATCACTTCCGGTACCGGCAGGGGCAATTACCATGTTAT  
CCTACTCTTATTATCCCTTCCAGTACTGGCAGGTGCCATTACCATGTTAT  
CTTACTTTTATTATTCTTTTTAGTACTGGCAGGTGCCATTACCATGTTAT  
\* \*\*\* \*\*\*\*\* \* \*\*\*\* \*\*\*\*\* \*\* \*\* \* \*\* \*\*\*\*\*

Brassica napus  
PB235\_cox1  
Citruŕllus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Milletia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

TAACCGATCGAAACTTTAATACAACCTTTTTGATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTGATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTUATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTGATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTUATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTUATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTUATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTUATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTGATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTGATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTGATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTGATCCCGCTGGAGGGGGA  
TGACCGATCGAAACTTTAATACAACCTTTTCTGATCCTGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTGATCCCGCTGGAGGGGGA  
TAACCGATCGAAACTTTAATACAACCTTTTTGATCTCGCAGGAGGAGGA  
\* \*\* \*\* \* \*\*\*\*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \*

Brassica napus  
PB235\_cox1  
Citruŕllus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Milletia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

GACCCAATTTTATAACCAGCATCTCTTTGTTCTTCGGT-----  
GACCCCATATTATAACCAGCATCTCTTTGTTCTTCGGT-----  
GACCCCATATTATAACCAGCATCTCTTTGTTCTTCGGTTTTAAATGGCC  
GACCCCATATTATAACCAGCATCTCTTTGTTCTTCGGT-----  
GACCCCATATTATAACCAGCATCTCTTTGTTCTTCGGT-----  
GACCCCATATTATAACCAGCATCTCTTTUAGTTCTTCGGT-----  
GACCCCATATTATAACCAGCATCTCTTTUAGTTCTTCGGT-----  
GACCCCATATTATAACCAGCATCTCTTTGTTCTTCGGT-----  
GACCCCATATTATAACCAGCATCTCTTTGTTCTTCGGT-----  
GACCCCATATTATAACCAGCATCTCTTTGTTCTTCGGT-----  
GACCCCATATTATAACCAGCATCTCTTTGTTCTTCGGT-----  
GACCCCATATTATAACCAGCATCTCTTTGTTCTTCGGT-----  
GACCCCATATTATAACCAGCATCTCTTTGTTCTTCGGT-----  
GATCCGATTTTATAACCAGCATCCATTTTGGTCTTTTCGGT-----  
GATCTGATTTTATAACCAGTATCTATTTTGGTTTTTTGGT-----  
\*\* \* \*\* \*\*\*\*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \*

Brassica napus  
PB235\_cox1  
Citruŕllus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus

-----CATCCAGAGGTGTATATTCTCATTCTGCCTGGATTCGGTATCAT  
-----CACCTGAAGTTTACATTCTAATTCTGCCGGGATTCGGTATCAT  
GAGAAGCACCTGAAGTTTACATCTAATTCTGCCTGGATTCGGTATCAT  
-----CACCTGAAGTTTACATTCTAATTCTGCCGGGATTCGGTATCAT  
-----CACCTGAAGTTTACATTCTAATTCTGCCGGGATTCGGTATCAT  
-----CATCCAGAGGTGTATATTCTCATTCTGCCTGGATTCGGTATCAT  
-----CATCCAGAGGTGTATATTCTCATTCTGCCTGGATTCGGTATCAT

Millettia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

-----CATCCAGAGGTGTATATTCU CATTCTGCCTGGATUCGGTATCAT  
-----CACCTGAAGTTTACATTCTAATTCTGCCGGGATUCGGTATCAT  
-----CATCCAGAGGTGTATATTCATTCTGCCTGGATTCGGTATTAT  
-----CACCTGAAGTTTACATTCTAATTCTGCCGGGATNCGGTATCAT  
-----CACCTGAAGTTTACATTCTAATTCTGCCGGGATUCGGTATCAT  
-----CATCCAGAGGTGCATATCCCATTCCGCCGGATCCGGTATCAT  
-----CATCCAGAGGTTTCATATCCAATTTTGCAGGATTCGGTATAAT  
-----TATCCAGAGGTTTATATTTCTAATTTTGTGAGGATTCGGTATAAT  
\* \*

Brassica napus  
PB235\_cox1  
Citruillus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

AAGTCATATCGTTTCTACTTTTTCGGGAAAACCGGTCTTCGGGTATCTAG  
AAGTCATATCGTTTCGACTTTTTCGGGAAAACCGGTTTTTCGGGTATCTAG  
AAGTCATATCGTTTCGACTTTTTCGGGAAAACCGGTTTTTCGGGTATCTAG  
AAGTCATATCGTTTCGACTTTTTCGGGAAAACCGGTTTTTCGGGTATCTAG  
AAGTCATATCGTTTCTACTTTTTCGGGAAAACCGTTTTTCGGGTATCTAG  
AAGTCATATCGTTTCGACTTTTTCGGGAAAACCGGTCTTCGGGTATCTAG  
AAGTCATATCGTTTCGACTTTTTCGGGAAAACCGGTCTTCGGGTATCTAG  
AAGTCATATCGTTTCGACTTTTTCGGGAAAACCGGTTTTTCGGGTATCTAG  
AAGTCATATCGTTTCGACTTTTTCGGGAAAACCGGTTTTTCGGGTATCTAG  
AAGTCATATCGTTTCGACTTTTTCGGGAAAACCGGTTTTTCGGGTATCTAG  
TAGTCATATCGTATCGACCTTTTTCAAGAAAACCGGTCTTCGGGTATCTAG  
AAGTCATATCGTTTCGACTTTTTCGGGAAAACCGGTTTTTCGGGTATCTAG  
AAGTCATATCGTTTCGACTTTTTCGGGAAAACCGGTTTTTCGGGTATCTAG  
TAGTCATATCGTATCGACTTTTTCGGGAAAACCGGTCTTCGGGTATCTAG  
TAGTCATATCGTTTCCACGTTTCCAAGAAAACCTGTATTCGGTTATCTAG  
TAGTCATATCGTTTCCACGTTTTTAAGAAAACCTGTATTCGGTTATCTAG  
\*\*\*\*\* \*

Brassica napus  
PB235\_cox1  
Citruillus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
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RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

GCATGGTTTATGCCATGATCAGTATTGGTGTTCTTAGGATTTCTTGTTGG  
GCATGGTTTATGCCATGATCAGTATAGGTGTTCTTGATTTCTTGTTGG  
GCATGGTTTATGCCATGATCAGTATAGGTGTTCTTGATTTCTTGTTGG  
GCATGGTTTATGCCATGATCAGTATAGGTGTTCTTGATTTCTTGTTGG  
GCATGGTTTATGCCATGATCAGTATAGGTGTTCTTGATTTCTTGTTGG  
GCATGGTTTATGCCATGATCAGTATAGGTGTTCTTGATTTCTTGTTGG  
GCATGGTTTATGCCATGATCAGTATAGGTGTTCTTGATTTCTTGTTGG  
GCATGGTTTATGCCATGATCAGTATAGGTGTTCTTGATTTCTTGTTGG  
GCATGGTTTATGCCATGATAAGTATAGGTGTTCTTGATTTCTAGTTGG  
GCATGGTTTATGCCATGATCAGTATAGGTGTTCTTGATTTCTTGTTGG  
GCATGGTTTATGCCATGATCAGTATAGGTGTTCTTGATTTCTTGTTGG  
GCATGGTTTATGCCATGATCAGTATAGGTGTTCTTGATTTCTTGTTGG  
GCATGGTTTATGCCATGATCAGTATTGGTGTTCTTGATTTCTTGTTGG  
GCATGGTTTATGTCACGATCAGTATTGGAGTTCTCGGATTTATCGTGTGG  
GCATGGTTTATGTTATGATCAGTATTGGAGTTCTCGGATTTATCGTGTGG  
\*\*\*\*\* \*

Brassica napus  
PB235\_cox1  
Citruillus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTTTACTGTGGGCTTAGACGTTGATAACCCGTGCCTACTT  
GCTCATCATATGTCTACTGTGGGCTCAGACGTTGATAACCCGTGCCTACTT  
GCACACCACATGTTTACTGTAGGCTTAGACGTTGATACTCGTGCCTACTT  
GCACACTACATGTTTACTGTAGGCTTAGACGTTGATACTTGTGCCTACTT  
\* \*

Brassica napus

CACCGCAGCTACCATGATCATAGCTGTCCCCACTGGAATCAAATCTTTA



Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

AATAGTCCCGGCAAATCTGGGCTAGACATTGCTCCACATGATACTTATT  
AATAGTATTGGCCAATTCGGGCTGGACATTGCTCCACATGATACTTATT  
AACAGTATCGGCCAATTCGGGCTGGACATTGCTCTACATGATACTTATT  
\*\* \*\* \*

Brassica napus  
PB235\_cox1  
Citruillus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

ATGTGGTT - GCACATTTCCATTATGTACTTTCTATGGGAGCCGTTTTTGC  
ATGTGGTT - GCACATTTCCATTATGTACTTTCTATGGGAGCCGTTTTTGC  
ATGTGGTT - GCACATTTCCATTATGTACTTTCTATGGGAGCCGTTTTTGC  
ATGTGGTT - GCACATTTCCATTATGTACTTTCTATGGGAGCCGTTTTTGC  
ATGTGGTT - GCGCATTTCCATTATGTACTTTCTATGGGAGCCGTTTTTGC  
ATGTGGTT - GCACATTTCCATTATGTACTTTCTATGGGAGCCGTTTTTGC  
ATGTGGTT - GCACATTTCCATTATGTACTTTCTATGGGAGCCGTTTTTGC  
ATGTGGTT - GCACATTTCCATTATGTACTTTCTATGGGAGCCGTTTTTGC  
ATGTGGTT - GCACATTTCCATTATGTACTTTCTATGGGAGCCGTTTTTGC  
ATGTGGTT - GCACATTTCCATTATGTACTTTCTATGGGAGCCGTTTTTGC  
ATGTGGTT - GCACATTTCCATTATGTACTTTCTATGGGAGCCGTTTTTGC  
ACGTGGTT - GCACATCTTCATTATGTTCTTCCATGTTGGGAGCCGTTCTGC  
ACGTGGTT - GCATATTTTTATTATGTTTCTTTTATGGGAGCCGTTTTTGT  
\* \*

Brassica napus  
PB235\_cox1  
Citruillus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

TTTATTTGCAGGATTTTACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCAGGATTTUACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCAGGATTTUACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCAGGATTTUACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCAGGATTTUACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCAGGATTTUACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCAGGATTTUACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCAGGATTTUACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCAGGATTTUACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCTGGATTTTACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCAGGATTTUACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCAGGATTTUACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TTTATTTGCAGGATTTUACTATTGGGTGGGTA AAAATCTTTGGTCCGACAT  
TCCATTTGCAGGATCTCACTCTCGGGCGGGTA AAAATCTCTGGTCCAACAT  
TTTATTTGCAGGATTTTATTATTGGATAGGTA AAAATGACGGGTCTCCAAT  
TTTATTTGCAGGATTTTATTATTGGATAGGTA AAAATAACAGGTCTCCAAT  
\* \*

Brassica napus  
PB235\_cox1  
Citruillus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ATCCTGAAACTTTAGGCCAAATCCATTTTTGGATTACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTTTGGATCACTTTTTTCGGGGTT  
ACCCTGAAACTTTAGGTCAAATCCATTTCCGGATCACTTTTCGGGGTT  
ATCCAGAGACTTTAGGTCTAATACATTTTTGGATTACTTTCTTTGGTGT  
ATTTAGAGATTTTAGGTCTAATATATTTTTGGATTACTTTCTTTGGTGT  
\* \*

Brassica napus  
PB235\_cox1  
Citruillus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo

AATTTGACCTTCTTTCTATGCATTTCTTAGGGCTTTCAGGTATGCCACG  
AATCUGACCTTCTTTCCUATGCATTTCTTAGGGCTTTCAGGTATGCCACG  
AATCUGACCU TCTTTCCCATGCATTTCTTAGGGCTTTCAGGTATGCCACG  
AATCUGACCTTCTTTCCUATGCATTTCTTAGGGCTTTCAGGTATGCCACG  
AATCUGACCTTCTTTCCUATGCATTTCTTAGGGCTTTCAGGTATGCCACG  
AATCUGACCU TCTTTCCCATGCATTTCTTAGGGCTTTCAGGTATGCCACG





RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

Brassica napus  
PB235\_cox1  
Citrullus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Milletia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

Brassica napus  
PB235\_cox1  
Citrullus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Milletia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

Brassica napus  
PB235\_cox1  
Citrullus lanatus  
BPM24\_cox1  
RRIC110\_cox1  
Cucurbita pepo  
Lotus japonicus  
Milletia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

Brassica napus  
PB235\_cox1  
Citrullus lanatus  
BPM24\_cox1  
RRIC110\_cox1

Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
RRIT251\_cox1  
Oryza sativa Japonica  
RRIM600\_cox1  
RRII105\_cox1  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis

#####  
**cox2 multiple sequence alignment**

Beta macrocarpa - - - - -ATGATTGTTCTGAGAATGGCTATTCTTCACAATGGCTCCTTGTGA  
Beta vulgaris maritima - - - - -ATGATTGTTCTGAGAATGGCTATTCTTCACAATGGCTCCTTGTGA  
Beta vulgaris vulgaris - - - - -ATGATTGTTCTGAGAATGGCTATTCTTCACAATGGCTCCTTGTGA  
Silene latifolia - - - - -ATGATTGTGATAGAATGGCTATTCTTCACAATGGCTCCTTGTGA  
Arabidopsis thaliana - - - - -ATGATTGTTCTAAAAATGGTTATTUUUUAACAATTTCTCCTTGTGA  
Brassica napus - - - - -ATGATTGTTCTAAAAATGGTTATTCTUUAACAATTTCTCCTTGTGA  
PB235\_cox2 - - - - -ATGATTGTTCTAGAATGGTTATTCTUUAACAATGGCTCCTTGTGA  
RRIT251\_cox2 - - - - -ATGATTGTTCTAGAATGGTTATTCTUUAACAATGGCTCCTTGTGA  
RRIC110\_cox2 - - - - -ATGATTGTTCTAGAATGGTTATTCTUUAACAATGGCTCCTTGTGA  
RRII105\_cox2 - - - - -ATGATTGTTCTAGAATGGTTATTCTUUAACAATGGCTCCTTGTGA  
BPM24\_cox2 - - - - -ATGATTGTTCTAGAATGGTTATTCTUUAACAATGGCTCCTTGTGA  
RRIM600\_cox2 - - - - -ATGATTGTTCTAGAATGGTTATTCTUUAACAATGGCTCCTTGTGA  
Citrullus lanatus - - - - -ATGATTGTTCTAAAAATGGCTATTCTTCACAATGGCTCCTTGTGA  
Cucurbita pepo - - - - -ATGATTGTTCTCAAATGGCTATTCTTCACAATGGCTUUTTGTGA  
Lotus japonicus - - - - -ATGAAATAGAAATGGCTATTCTCAGATTGGCTCCTTGTGA  
Millettia pinnata - - - - -GTTAAAGACGAATGGCTATTCTCAGAAAGCTCCTTGTGA  
Oryza sativa Japonica ATGATTCTTCGTTUATTAGAAATGTCGATTUCTUACAATCGCTCTTTGTGA  
Zea mays mays ATGATTCTTCGTTUATTAGAAATGTCGATTCUUCACAATCGCTCTTTGTGA  
Megaceros aenigmaticus - - - - -ATGAAAAACACATGGCTATTTC - - -CAATTGCTTATCGTGA  
Phaeoceros laevis - - - - -ATGAAAAACACATGGCTATTTC - - -CAATTGCTTATCGTGA  
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Beta macrocarpa TGCAGCGGAACCATGGCAATTAGGATTTCAAGACGCAGCAACACCTATGA  
Beta vulgaris maritima TGCAGCGGAACCATGGCAATTAGGATTTCAAGACGCAGCAACACCTATGA  
Beta vulgaris vulgaris TGCAGCGGAACCATGGCAATTAGGATTTCAAGACGCAGCAACACCTATGA  
Silene latifolia TGCAGCGGAACCGTGGCAATTAGGATTTCAAGACGCAGCAACACCTATGA  
Arabidopsis thaliana TGCAGCGGAACCATGGCAATTAGGATU TCAAGACGCAGCTACACCTATAA  
Brassica napus TGCAGCGGAACCATGGCAATTAGGATU TCAAGACGCAGCAACACCTATAA  
PB235\_cox2 TGCAGCGGAACCATGGCAATTAGGATU TCAAGACGCAGCAAGCCCTATGA  
RRIT251\_cox2 TGCAGCGGAACCATGGCAATTAGGATU TCAAGACGCAGCAAGCCCTATGA  
RRIC110\_cox2 TGCAGCGGAACCATGGCAATTAGGATU TCAAGACGCAGCAAGCCCTATGA  
RRII105\_cox2 TGCAGCGGAACCATGGCAATTAGGATU TCAAGACGCAGCAAGCCCTATGA  
BPM24\_cox2 TGCAGCGGAACCATGGCAATTAGGATU TCAAGACGCAGCAAGCCCTATGA  
RRIM600\_cox2 TGCAGCGGAACCATGGCAATTAGGATU TCAAGACGCAGCAAGCCCTATGA  
Citrullus lanatus TGCAGCGGAACCATGGCAATTAGGATU TCAAGACGCAGCAACACCTATGA  
Cucurbita pepo TGCAGCGGAACCATGGCAATTAGGATU TCAAGACGCAGCAACACCTATGA  
Lotus japonicus TGCAGCGGAACCATGGCAATTAGGATTTCAAGACGCAGCAACACCTATGA  
Millettia pinnata TGCAGCGGAACCATGGCAATTAGGATTTCAAGACGCAGCAACACCTATGA  
Oryza sativa Japonica TGCTGCGGAACCATGGCAATTAGGATU TCAAGACGCTGCAACACCTATGA  
Zea mays mays TGCTGCGGAACCATGGCAATTAGGATU TCAAGACGCAGCAACACCTATGA  
Megaceros aenigmaticus TGCTGCCGAACCTTGGCAATTGGGATTTCAAGACGCAGCAACACCTATGA  
Phaeoceros laevis TGCTGCCGAACCTTGGCAATTGGGATTTCAAGACGCAGCAACACTAATGA  
\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\* \* \* \*\* \*

Beta macrocarpa TGCAAGGAATAATCGACTTACATCATGATATCTTTTTCTTCTUATTCTT  
Beta vulgaris maritima TGCAAGGAATAATCGACTTACATCATGATATCTTTTTCTTCTUATTCTT  
Beta vulgaris vulgaris TGCAAGGAATAATCGACTTACATCATGATATCTTTTTCTTCTUATTCTT  
Silene latifolia TGCAAGGAATAATAGACTTACATCATGATATCTTTTTCTTCTTATTCTT



Arabidopsis thaliana  
Brassica napus  
PB235\_cox2  
RRIT251\_cox2  
RRIC110\_cox2  
RRII105\_cox2  
BPM24\_cox2  
RRIM600\_cox2  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Oryza sativa Japonica  
Zea mays mays  
Megaceros aenigmaticus  
Phaeoceros laevis

TGCAAGGAATAATAGACTTACATCACGATATCTTTTTCTTCCTUATTCTG  
TGCAAGGAATAATAGACTTACATCACGATATCTTTTTCTTCCTUATTCTG  
TGCAAGGAATAATGGACTTACATCACGATATCTTTTTCTTCCTCATTCTG  
TGCAAGGAATAATGGACTTACATCACGATATCTTTTTCTTCCTCATTCTG  
TGCAAGGAATAATGGACTTACATCACGATATCTTTTTCTTCCTCATTCTG  
TGCAAGGAATAATGGACTTACATCACGATATCTTTTTCTTCCTCATTCTG  
TGCAAGGAATAATGGACTTACATCACGATATCTTTTTCTTCCTCATTCTG  
TGCAAGGAATAATGGACTTACATCACGATATCTTTTTCTTCCTCATTCTG  
TGCAAGGAATAATAGACTTACATCACGATATCTTTTTCTTCCTCATTCTT  
TGCAAGGAATAATAGACTTACATCACGATATCTTTTTCTTCCTCATTCTT  
TGCAAGGAATAATAGACTTACATCACGATATCTTTTTCTTCCTCATTCTT  
TGCAAGGAATAATAGACTTACATCACGATATCTTTTTCTTCCTCATTCTG  
TGCAAGGAATCATTGACTTACATCACGATATCTTTTTCTTCCTUATTCTG  
TGCAAGGAATCATTGACTTACATCACGATATCTTTTTCTTCCTCATTCTG  
TGCAAGGAATGATTGACTTACATCATGATATTTTTTTCTTTCTACCCATC  
TGCAAGGAATAATTGACTTACATCATGATATTTTTTTCTTTCTACTCATT  
\*\*\*\*\* \*\* \*\*\*\*\* \*\* \* \*\*

Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
PB235\_cox2  
RRIT251\_cox2  
RRIC110\_cox2  
RRII105\_cox2  
BPM24\_cox2  
RRIM600\_cox2  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Oryza sativa Japonica  
Zea mays mays  
Megaceros aenigmaticus  
Phaeoceros laevis

ATTTTGGTTTTCGTATUATGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTCGTATUATGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTCGTATUATGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTCGTATUATGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTCGTATTATGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTCGTATTATGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTUGTATTAUUGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTUGTATTAUUGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTUGTATTAUUGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTUGTATTAUUGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTUGTATTAUUGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTUGTATTAUUGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTUGTATTAUUGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTCGTATCAUUGGATCTTGGTTCGCGCTTATGGCATTTC  
CTTTTTGTTTTCGTATCAUUGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTCGTATU AUGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTCGTATU AUGGATCTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTCGTATU AUGGATGTTGGTTCGCGCTTATGGCATTTC  
ATTTTGGTTTTCGTATU AUGGATGTTGGTTCGCGCTTATGGCATTTC  
ATTATGATCTTTGATTATGGATGTTGGTTCGCGCTTATGGCATTTC  
ATTCTGATCTTTGATCATGGATGTTGGTTCGCGCTTATGGCATTTC  
\*\* \* \* \*\* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\*

Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
PB235\_cox2  
RRIT251\_cox2  
RRIC110\_cox2  
RRII105\_cox2  
BPM24\_cox2  
RRIM600\_cox2  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Oryza sativa Japonica  
Zea mays mays  
Megaceros aenigmaticus  
Phaeoceros laevis

CTATAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATAAAAAAATGCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATAAAGAAAATGCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATCAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATCAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATCAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATCAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATCAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATCAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATCAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATCAAAAAAATAAAATACCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATAAACAAAATCAAATACCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATCAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATAAAAAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CGAGCAAACAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CGAGCAAACAAATCCAATCCCGCAAAGGATTGTTTCATGGAACACTATCG  
CTATAAGAGAAATCCAATCCAGAAAGGATTGTTTCATGGAACACTATAG  
CTATAAGAGAAATCCAATCCAGAAAGGATTGTTTCATGGAACACTATAG  
\* \* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\*



Megaceros aenigmaticus  
Phaeoceros laevis

TGTTACTATCAAAGCTATTGGACATCAATGGTATTGGACTTATGAGTATT  
TGTTACTATCAAAGCTATTGGACATCAATGGTATTGGATATCCTATTATT  
\* \*\*\*\*\* \* \* \*\*\*\*

Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
PB235\_cox2  
RRIT251\_cox2  
RRIC110\_cox2  
RRII105\_cox2  
BPM24\_cox2  
RRIM600\_cox2  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Oryza sativa Japonica  
Zea mays mays  
Megaceros aenigmaticus  
Phaeoceros laevis

CGGACTATAACAGTTCGGATGAACAGTCACTCACTTTTGACAGTTATAUG  
CGGACTATAACAGTTCGGATGAACAGTCACTCACTTTTGACAGTTATAUG  
CGGACTATAACAGTTCGGATGAACAGTCACTCACTTTTGACAGTTATAUG  
CGGACTATAACAGTTCGGATGAACAGTCACTCACTTTTGACAGTTATATG  
CTGACTATAACAGTTCGGATGAGCAGTCACTCACTTTTGACAGTTATATG  
CTGACTATAACAGTTCGGATGAGCAGTCACTCACTTTTGACAGTTATATG  
CAGACTATAACAGTTCGGATGAAGAGTCACTCACTTTTGACAGTTATAUG  
CAGACTATAACAGTTCGGATGAAGAGTCACTCACTTTTGACAGTTATAUG  
CAGACTATAACAGTTCGGATGAAGAGTCACTCACTTTTGACAGTTATAUG  
CAGACTATAACAGTTCGGATGAAGAGTCACTCACTTTTGACAGTTATAUG  
CAGACTATAACAGTTCGGATGAAGAGTCACTCACTTTTGACAGTTATAUG  
CTGACTATAACAGTTCGGATGAACAGTCACTCACTTTTGACAGTTATAUG  
CTGACTATAACAGTTCGGATGAAGAGTCACTCACTTTTGACAGTTATAUG  
CAGACTATAACAGTTCGGATGAACAGTCACTCACTTTTGACAGTTATAUG  
CAGACTATAACAGTTCGGATGAACAGTCACTCACTTTTGACAGTTATAUG  
CGGACTATAACAGTTCGGATGAACAGTCACTCACTTTTGACAGTTATAUG  
CGGACTATAACAGTTCGGATGAACAGTCACTCACTTTTGACAGTTATAUG  
CAGACTATAACAGTTCGGATGAACAGTCACTAACTTTTGACAGTTATATG  
CCGACTATAACAGTTCGGATGAACAGTCACTAACTTTTGACAGTTATATG  
\* \*\*\*\*\* \* \* \*\*\*\*

Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
PB235\_cox2  
RRIT251\_cox2  
RRIC110\_cox2  
RRII105\_cox2  
BPM24\_cox2  
RRIM600\_cox2  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Oryza sativa Japonica  
Zea mays mays  
Megaceros aenigmaticus  
Phaeoceros laevis

ATTCCAGAAGATGATCUAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATCUAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATCUAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATTTAGAATTGGGTCAATTACGTTTATTAGAAGTGGGA  
ATTCCAGAAGAAGATCTAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGAAGATCTAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATCTAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATCTAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATCTAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATCTAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATCTAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATCTAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATCTAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATCTAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATUUAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTCCAGAAGATGATUUAGAATTGGGTCAATUACGTTTATTAGAAGTGGGA  
ATTACGGAGGATGAGTTAGAATTAGGTGCATTACGTTTATTAGAAGTGGGA  
ATTACGGAGGATGAGTCAGAATTAGGTTCATTATGTTTATTAGAAGTGGGA  
\*\*\* \* \*\* \*\* \* \*\*\*\*\* \* \* \* \*\*\*\*

Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
PB235\_cox2  
RRIT251\_cox2  
RRIC110\_cox2  
RRII105\_cox2  
BPM24\_cox2  
RRIM600\_cox2  
Citrullus lanatus  
Cucurbita pepo

CAATAGAGTGGTTGTACCAGCCAAAACATATACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATATACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATATACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATATACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAT  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAU  
CAATAGAGTGGTTGTACCAGCCAAAACATCTACGTATTATTGTAACAU





RRIC110\_cox3 -----ATGAT  
RRIM600\_cox3 -----ATGAT  
Citrullus lanatus -----ATGAT  
Cucurbita pepo -----ATGAT  
Lotus japonicus -----ATGAT  
Millettia pinnata -----ATGAT  
Oryza sativa Japonica ATGGGGGTGAAGGGGGTTTACATACAACCGGGGCAAAGTGGTTTATGAT  
Arabidopsis thaliana -----ATGAT  
Brassica napus -----ATGAT  
Beta macrocarpa -----ATGAT  
Beta vulgaris maritima -----ATGAT  
Beta vulgaris vulgaris -----ATGAT  
Silene latifolia -----ATGAT  
Anomodon rugelii -----ATGAG  
Anomodon attenuatus -----ATGAG  
Huperzia squarrosa -----ATGAG  
Megaceros aenigmaticus -----ATGAG  
Phaeoceros laevis -----ATGAG  
\*\*\*\*

PB235\_cox3 TGAATCTCAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCTA  
RRIT251\_cox3 TGAATCTCAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCTA  
RRII105\_cox3 TGAATCTCAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCTA  
BPM24\_cox3 TGAATCTCAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCTA  
RRIC110\_cox3 TGAATCTCAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCTA  
RRIM600\_cox3 TGAATCTCAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCTA  
Citrullus lanatus TGAATCTAAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCCA  
Cucurbita pepo TGAATCTCAGAGGCATTCTTTTCATTTGGTAGATCCAAGTCCATGGCCCA  
Lotus japonicus TGAATCTCAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCTA  
Millettia pinnata TGAATCTCAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCTA  
Oryza sativa Japonica TGAATCTCAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCTA  
Arabidopsis thaliana TGAATCTCAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCTA  
Brassica napus TGAATCTCAGAGGCATTCTTATCATTTGGTAGATCCAAGTCCATGGCCTA  
Beta macrocarpa TGAATCTCAAAGGCATTCTTTTCATTTGGTAGATCCAAGTCCATGGCCTA  
Beta vulgaris maritima TGAATCTCAAAGGCATTCTTTTCATTTGGTAGATCCAAGTCCATGGCCTA  
Beta vulgaris vulgaris TGAATCTCAAAGGCATTCTTTTCATTTGGTAGATCCAAGTCCATGGCCTA  
Silene latifolia TGAATCTCAACGGCATTCTTTTCATTTGGTAGATCCAAGTCCATGGCCTA  
Anomodon rugelii TGTCTCTCAAAGCATCCTTATCATTTAGTAGATCCAAGTCCATGGCCTC  
Anomodon attenuatus TGTCTCTCAAAGCATCCTTATCATTTAGTAGATCCAAGTCCATGGCCTC  
Huperzia squarrosa TGTCTCTCAAAGCATCCTTACCATTAGTAGATCCAAGTCCATGGCTAA  
Megaceros aenigmaticus TGTCTCTCAAAGCATCTTTATCATTTAGTAGATCCAAGTCCACGGCTAA  
Phaeoceros laevis  
\*\* \*\* \* \*\* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

PB235\_cox3 TTTTCGGGTTCACTCGGAACCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
RRIT251\_cox3 TTTTCGGGTTCACTCGGAACCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
RRII105\_cox3 TTTTCGGGTTCACTCGGAACCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
BPM24\_cox3 TTTTCGGGTTCACTCGGAACCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
RRIC110\_cox3 TTTTCGGGTTCACTCGGAACCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
RRIM600\_cox3 TTTTCGGGTTCACTCGGAACCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
Citrullus lanatus TTTTCGGGTTCACTCGGAGCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
Cucurbita pepo TTTTCGGGTTCACTCGGAGCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
Lotus japonicus TTTTCGGGTTCACTCGGAGCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
Millettia pinnata TTTTCGGGTTCACTCGGAGCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
Oryza sativa Japonica TTTTCGGGTTCACTCGGAGCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
Arabidopsis thaliana TTTTCGGGTTCACTCGGAGCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
Brassica napus TTTTCGGGTTCACTCGGAGCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
Beta macrocarpa TTTTCGGGTTCACTCGGAGCTTTGGCAACGACCGTAGGAGGTGTGATGTAC  
Beta vulgaris maritima TTTTCGGGTTCACTCGGAGCTTTGGCAACGACCGTAGGAGGTGTGATGTAC  
Beta vulgaris vulgaris TTTTCGGGTTCACTCGGAGCTTTGGCAACGACCGTAGGAGGTGTGATGTAC  
Silene latifolia TTTTCGGGTTCACTCGGAGCTTTGGCAACCACCGTAGGAGGTGTGATGTAC  
Anomodon rugelii TTTTCGGGTTCACTCGGAGCTTTGGCAACGACCGTAGGAGGTGTGATGTAC



Lotus japonicus  
Millettia pinnata  
Oryza sativa Japonica  
Arabidopsis thaliana  
Brassica napus  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Anomodon rugelii  
Anomodon attenuatus  
Huperzia squarrosa  
Megaceros aenigmaticus  
Phaeoceros laevis

CGTTGGAAGGACATCATACCAAAGTCGTACAATTAGGACU<sup>T</sup>TCGATATGGT  
CGTTGGAAGGACATCATACCAAAGTCGTACAATTAGGACU<sup>T</sup>TCGATATGGT  
CGTTGGAAGGGCATCATACAAAAGCTGTACAATTAGGACCTCGATATGGT  
CGTTGGAAGGACATCATACCAAAGTCGTACAATTAGGACU<sup>T</sup>TCGATATGGT  
CGTTGGAAGGACATCATACCAAAGTCGTACAATTAGGACU<sup>T</sup>TCGATATGGT  
CGTTAGAAGGACATCATACCAAAGTCGTACAATTAGGACTTCGATATGGT  
CGTTAGAAGGACATCATACCAAAGTCGTACAATTAGGACTTCGATATGGT  
CGTTAGAAGGACATCATACCAAAGTCGTACAATTAGGACTTCGATATGGT  
CGTTAGAAGGACATCATACCAAAGTCGTACAATTAGGACTTCGATATGGT  
CTTACGAAGGACATCATACATTTGTGGTCCAATTAGGACTTCGCTATGGT  
CTTACGAAGGACATCATACATTTGTGGTCCAATTAGGACTTCGCTATGGT  
CTTACGAAGGACATCATACATTTATGGTCCAATTAGGACTTCGTTATGGT  
CTTACGAAGGACATCATACATTTATGGTCCAATTAGGACTTCGTTATGGT  
\* \*

PB235\_cox3  
RRIT251\_cox3  
RRII105\_cox3  
BPM24\_cox3  
RRII110\_cox3  
RRIM600\_cox3  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Oryza sativa Japonica  
Arabidopsis thaliana  
Brassica napus  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Anomodon rugelii  
Anomodon attenuatus  
Huperzia squarrosa  
Megaceros aenigmaticus  
Phaeoceros laevis

TTTATTCUG<sup>T</sup>TTCATCGTATCGGAGGTTATGTTT<sup>C</sup>U<sup>T</sup>TTTTGCTTTTTTTTTG  
TTTATTCUG<sup>T</sup>TTCATCGTATCGGAGGTTATGTTT<sup>C</sup>U<sup>T</sup>TTTTGCTTTTTTTTTG  
TTTATTCUG<sup>T</sup>TTCATCGTATCGGAGGTTATGTTT<sup>C</sup>U<sup>T</sup>TTTTGCTTTTTTTTTG  
TTTATTCUG<sup>T</sup>TTCATCGTATCGGAGGTTATGTTT<sup>C</sup>U<sup>T</sup>TTTTGCTTTTTTTTTG  
TTTATTCUG<sup>T</sup>TTCATCGTATCGGAGGTTATGTTT<sup>C</sup>U<sup>T</sup>TTTTGCTTTTTTTTTG  
TTTATTCNG<sup>T</sup>TTCATCGTATCGGAGGTTATGTTT<sup>C</sup>U<sup>T</sup>TTTTGCTTTTTTTTTG  
TTTATTCGT<sup>T</sup>TTATCGTATCGGAGGTTATGTTT<sup>C</sup>U<sup>T</sup>TTTTGCTTTTTTTTT<sup>G</sup>  
TTTATTCGT<sup>T</sup>TTATCGTATCGGAGGTGATGTTT<sup>C</sup>U<sup>T</sup>TTTAGCTTTTTTTTT<sup>G</sup>  
T<sup>U</sup>TATTCUG<sup>T</sup>TTCATCGTATCGGAGGTTATGTTT<sup>C</sup>U<sup>T</sup>TTTTGCTTTTTTTTT<sup>G</sup>  
T<sup>U</sup>TATTCGT<sup>T</sup>TTCATCGTATCGGAGGTTATGTTT<sup>C</sup>U<sup>T</sup>TTTTGCTTTTTTTTT<sup>G</sup>  
TCTATTCTTT<sup>C</sup>TATAGTCTCGGAGGTTATGTTT<sup>C</sup>TTTTTGCTTTTTTTTTG  
T<sup>U</sup>TATTCGT<sup>T</sup>TTCATCGTATCGGAGGTTATGTTT<sup>C</sup>TTTTT<sup>G</sup>CTTTTTTTTTG  
T<sup>U</sup>TATTCGT<sup>T</sup>TTCATCGTATCGGAGGTTATGTTT<sup>C</sup>TTTTT<sup>G</sup>CTTTTTTTTTG  
TTTATTTT<sup>G</sup>TTCAT<sup>U</sup>G<sup>T</sup>TATCGGAGGTTATGTTT<sup>C</sup>TTTTT<sup>G</sup>CTTTTTTTTTG  
TTTATTTT<sup>G</sup>TTCAT<sup>U</sup>G<sup>T</sup>TATCGGAGGTTATGTTT<sup>C</sup>TTTTT<sup>G</sup>CTTTTTTTTTG  
TTTATTTT<sup>G</sup>TTCAT<sup>U</sup>G<sup>T</sup>TATCGGAGGTTATGTTT<sup>C</sup>TTTTT<sup>G</sup>CTTTTTTTTTG  
TTTATTTT<sup>G</sup>TTCATCGT<sup>C</sup>TCTCGGAGGTTATGTTT<sup>C</sup>TTTTT<sup>G</sup>CTTTTTTTTTG  
ATGATTTT<sup>G</sup>TTCATCGTGTCTGAAGTCATGTTTTTTTTAGCTTTCTTTT<sup>G</sup>  
ATGATTTT<sup>G</sup>TTCATCGTGTCTGAAGTCATGTTTTTTTTAGCTTTCTTTT<sup>G</sup>  
ATGATTTT<sup>G</sup>TTCATCGTGTCTGAAGTCATGTTTTTTTTAGCTTTCTTTT<sup>G</sup>  
ATGATTTT<sup>G</sup>TTTATCGTGTCTGAAGTCACGTTTTTTTTAGCTTTCTTTT<sup>G</sup>  
ATGATTTT<sup>G</sup>TTTATTGTGTTTGAAGTCATGTTTTTTTTAGCTTTCTTTT<sup>G</sup>  
\* \*

PB235\_cox3  
RRIT251\_cox3  
RRII105\_cox3  
BPM24\_cox3  
RRII110\_cox3  
RRIM600\_cox3  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Oryza sativa Japonica  
Arabidopsis thaliana  
Brassica napus  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Anomodon rugelii  
Anomodon attenuatus  
Huperzia squarrosa  
Megaceros aenigmaticus  
Phaeoceros laevis

GGCTT<sup>U</sup>TTTT<sup>T</sup>CATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>CATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>CATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>CATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>CATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>TCATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>TCATTCTTCTTTGGCACCCACGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>TCATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>TCATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>TCATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>TCATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>TCATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>TCATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>TCATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCTT<sup>U</sup>TTTT<sup>T</sup>TCATTCTTCTTTGGCACCTACGGTAGAGATCGGAGGTATTT  
GGCCTTTTT<sup>T</sup>CATTCTTCTTTGGCACCCACGGTAGAAAATTGGAGCTATTC  
GGCCTTTTT<sup>T</sup>CATTCTTCTTTGGCACCCACGGTAGAAAATTGGAGCTATTC  
GGCCTTTTT<sup>T</sup>CATTCTTCTTTGGCACCCACGGTAGAAAATTGGAGCTATTC  
GGCCTTTCTTTACCCCTCCTTTGGCACCCACGGTAGAGATTGGAGCTATTT  
GGCCTTTTT<sup>T</sup>CATTCTTCTTTGGCACCTACGGTAGAGATTGGAGCTATTT











Beta vulgaris maritima -----GTGACGGTTACAAGAATGGCGGGGAAGTGAATAGTACCC  
Beta vulgaris vulgaris -----GTGACGGTTACAAGAATGGCGGGGAAGTGAATAGTACCC  
Silene latifolia -----ACAGGTGACGGTTACAAGAATGGCGGGGAAGTGAATAGTACTC  
BPM24\_matR -----  
PB235\_matR -----  
Zea mays mays -----GAGCGAACTGAGCGAGCCATGAGGCGCCTATCGGCAAGGCTT  
RRIT251\_matR -----  
RRII105\_matR -----  
RRIM600\_matR -----  
Cycas taitungensis -----CTCAGAGCTGCTATTGCGAAAATACTGCTACTGGCGTCCCTC

Arabidopsis thaliana G-ACGACATTCAGGGATGGATGTAGAC--CCATCGGGCAGGGA--TAATC  
Brassica napus G-ACGACATTCAGGGATGGATGTAGAC--CCATCGGGCAGGGA--TAATC  
Lotus japonicus G-ACGACATTCAGGGATGGATGTAGAC--CCATCGGGCAGGGA--TAATC  
Milletia pinnata G-ACGACATTCAGGGATGGATGTAGAC--CCATCGGGCAGGGA--TAATC  
Citrullus lanatus G-ACGACATTCAGGGATGGATGTAGAC--CCATCGGGCAGGGA--TAATC  
Cucurbita pepo G-ACGACATTCAGGGATGGATGTAGAC--CCATCGGGCAGGGA--TAATC  
RRIC110\_matR -----  
Beta macrocarpa G-ACGACATTCAGGGATGGATGTAGAC--CCATCGAGCAGGGA--TAATC  
Beta vulgaris maritima G-ACGACATTCAGGGATGGATGTAGAC--CCATCGAGCAGGGA--TAATC  
Beta vulgaris vulgaris G-ACGACATTCAGGGATGGATGTAGAC--CCATCGAGCAGGGA--TAATC  
Silene latifolia G-ACGACATTCAGGGATGGATGTAGAC--CTATCGAGCAGGGA--TAATC  
BPM24\_matR -----  
PB235\_matR -----  
Zea mays mays GGAAAAGCCTTAAGTTTAGGCTTAGGCTCCCTTCCCTTCACTGAACTGATT  
RRIT251\_matR -----  
RRII105\_matR -----  
RRIM600\_matR -----  
Cycas taitungensis CCCTTACTTATTAACGCGGAT-CAGGTCTAAACCAGGCACACC--CGGCT

Arabidopsis thaliana ATTCCGGTCCTGGGAGAGGTATTGATTACTCGACTAAAAGGAGAGGAACC  
Brassica napus ATTCCGGTCCTGGGAGAGGTGCT--TTA-----GCAAC-  
Lotus japonicus ATTCCGGTCCTGGGAGAGGT-----  
Milletia pinnata ATTCCGGTCCTGGGAGAGGT-----  
Citrullus lanatus ATTCTGGTCCTGGGAGAGGT-----  
Cucurbita pepo ATTCTGGTCCTGGGAGAGGT-----  
RRIC110\_matR -----  
Beta macrocarpa ATTCCGGTCCTGGGAGAGGT-----  
Beta vulgaris maritima ATTCCGGTCCTGGGAGAGGT-----  
Beta vulgaris vulgaris ATTCCGGTCCTGGGAGAGGT-----  
Silene latifolia ATTCCGGTCCTGGGAAAGGT-----  
BPM24\_matR -----  
PB235\_matR -----  
Zea mays mays CACCCGGTCCAAACCTGCTGAGCTAGCTAATTTTTCTTTACGAGATC-  
RRIT251\_matR -----  
RRII105\_matR -----  
RRIM600\_matR -----  
Cycas taitungensis GGCTCATTTTTACGAGATGGTTTTTCGGCTCCCAGAGCCCCGCCTCCTCTT

Arabidopsis thaliana CCATCGACTGAAAGAAGAGGAGAGGTGGCGACCATTTTTCAAGAACCAAAA  
Brassica napus ---TCGACTGAAAGAAGAAGAGAGGTGGCGACCATTTTTCAAGAACCAAAA  
Lotus japonicus -----GGCGACCATTCTCAAGAAC-----  
Milletia pinnata -----GGCGACCATTCTCAAGAAC-----  
Citrullus lanatus -----GGCGACCATTCTCAAGAACCAAAA  
Cucurbita pepo -----GGAGACCATTCTCAAGAACCAAAA  
RRIC110\_matR -----  
Beta macrocarpa -----AGCGACCATTCTTAAGAACCAAAA  
Beta vulgaris maritima -----AGCGACCATTCTTAAGAACCAAAA  
Beta vulgaris vulgaris -----AGCGACCATTCTTAAGAACCAAAA

Silene latifolia -----AGCGACCATTCTCAAGAACCAAAA  
BPM24\_matR -----  
PB235\_matR -----  
Zea mays mays ---TCGGCTCTTCGGAATGATTGGAGAGAGCCCCGCCTCCTCTTGTTGG  
RRIT251\_matR -----  
RRII105\_matR -----  
RRIM600\_matR -----  
Cycas taitungensis GCCAGGGCCTTGTTGAGCCCGGAGAAGGGTGATGATACTACTTCTT

Arabidopsis thaliana AGACTGAACTGAGGGAAGCCCT---ATGAGTCACTGAAACGACGGCAGGA  
Brassica napus AGACTGAACTGAGGGAAGCCCT---ATGAGTCACTGAAACGAC----GGG  
Lotus japonicus ----TGAGCTGAGGGAAGCCTT---ATGAGTCACTGAAACGACGGCAGGG  
Milletia pinnata ----TGAGCT-----T---ATGAGTCACTGAAACGACGGCAGGG  
Citrullus lanatus AGACTGAGCTGAGGGAAGCCCT---ATGAGTCACTGAAATGACAGCGGGA  
Cucurbita pepo AGACTGAGCTGAGGGAAGCCCT---ATGAGTCACTGAAATGACAG-----  
RRIC110\_matR -----  
Beta macrocarpa AGACTGAGCTGAGGGAAGCCCC---ATAAGTCACTGAAACGACGGCAGGC  
Beta vulgaris maritima AGACTGAGCTGAGGGAAGCCCC---ATAAGTCACTGAAACGACGGCAGGC  
Beta vulgaris vulgaris AGACTGAGCTGAGGGAAGCCCC---ATAAGTCACTGAAACGACGGCAGGC  
Silene latifolia AGACTGAGCTGAGGGAAGCCCC---ATAAGTCACTGAAACGACGGCAGGC  
BPM24\_matR -----  
PB235\_matR -----  
Zea mays mays TGCCGGGCCCCGGGACTACTTCTGAAAGAGCCTTTCGTTCCG-GCCGGCA  
RRIT251\_matR -----  
RRII105\_matR -----  
RRIM600\_matR -----  
Cycas taitungensis AAATTCCGAAAGATTGTTTCC---ATAAATCCGATCCGTTCCGGCAGG-

Arabidopsis thaliana GGGGGCC--TTTGATTATAAAAAAGG-----GGAGCAAAAAACGAGCTT  
Brassica napus TTCCTCC--CTTGATTATCAAAAAAGG-----GGAGCAAAAAACGAGCTT  
Lotus japonicus GGGCC--GTCGATCTATCAATAGAG-----GGAGCAAAAAACGGGCTT  
Milletia pinnata GGGCCTTGATCTATCAATCAATAGAG-----GGAGCAAAAAACGGGCTT  
Citrullus lanatus GGAGGGTCTTGATCTATCAATAGAG-----GGAGCAAAAAAGGGGCTT  
Cucurbita pepo --AGGGTCTTGATCTATCAATAGAGATAGAGGAAGCAAAAAAGGGGCTT  
RRIC110\_matR -----  
Beta macrocarpa AATGAAA--TTGTCTATCAATAGAG-----GGAGCAAAAAACGGGCTT  
Beta vulgaris maritima AATGAAA--TTGTCTATCAATAGAG-----GGAGCAAAAAACGGGCTT  
Beta vulgaris vulgaris AATGAAA--TTGTCTATCAATAGAG-----GGAGCAAAAAACGGGCTT  
Silene latifolia AATGAAA--TTCTCTATCAATAGAG-----GGAGCAAAAAACGGGCTT  
BPM24\_matR -----  
PB235\_matR -----  
Zea mays mays GGAGGGGCCCTGATCTATCAATTGAG-----GGAGCAAAAAACAGGCTT  
RRIT251\_matR -----  
RRII105\_matR -----  
RRIM600\_matR -----  
Cycas taitungensis AGGGCCCCTTTCAGCTATCGAAATATATGG-GGGAGCAAAAAACGGGCTT

Arabidopsis thaliana TTCCCCCTT-TACAATATGAAGAAAGAAAGAAGGGTTGAAGTTTAGACC  
Brassica napus TTCCCCCTT-TACAATATGAAGAAAGAAAGAAGGGTTGAAGTTTAGACC  
Lotus japonicus TGCTCCCCTT-TACAATATGAAGAAAGAAATAAAGGTTCGAAGTTTAGACC  
Milletia pinnata TGCTCCCCTT-TACAATATGAAGAAAGAAATAAAGGTTCGAAGTTTAGACC  
Citrullus lanatus TGCTCCCCTT-TACAATATGAAGAAAGAAATCCGGGTTCGAAGTTTAGACC  
Cucurbita pepo TGCTCC----TACAATATGAAGAAAGAAAGAAGGGTTCGAAGTTTAGACC  
RRIC110\_matR -----  
Beta macrocarpa TGCTCCCCTT-TACAATATGAAGAAAGAAATAAAGGTTCGAAGTTTAGACC  
Beta vulgaris maritima TGCTCCCCTT-TACAATATGAAGAAAGAAATAAAGGTTCGAAGTTTAGACC  
Beta vulgaris vulgaris TGCTCCCCTT-TACAATATGAAGAAAGAAATAAAGGGTUGAAGTTTAGACC  
Silene latifolia TGCTCCCCTT-TACAATATGAAGAAAGAAAGAAGGGTTCGAAGTTTAGACC  
BPM24\_matR -----



RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

CGCTCGGGTCGAGGCTGCCACTCGGTCTTAAGACGGATCAAAGAAGAGTG  
CGCTCGGGTCGAGGCTGCCACTCGGTCTTAAGACGGATCAAAGAAGAGTG  
CGCTCGGGTCGAGGCTGCCACTCGGTCTTAAGACGGATCAAAGAAGAGTG  
CGCCCCGGTCGAGGCTGCCACTCGGCCCTAATACGGATAAAAAAAGAGCG  
\* \* \*\*\*\* \* \*\*\*\* \*\* \* \*\*\*\* \*\*\* \* \*\*\*\* \* \*\* \*\*\*\* \* \*

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

GGGAATCTCTCGCTGGTTTTAGAAATTCGACATCAGGAAGTGTTCACAC  
GGGAATCTCTCGCTGGTTTTAGAAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTGGAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTGGAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTGGAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTAGAAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTGGAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTGGAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTGGAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTAGAAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTAGAAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTAGAAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTAGAAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGCTGGTTTTAGAAATTCGACATCAGGAAGTGTTCACAC  
GGGAACCTCTCGTTGGTCTTGGAAATTCGGCATCTAAAGTGTTCACAC  
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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

CCATCGACCGACATCGACTCATCUAAATTTTGAAGGAAGAGATCGACGAT  
CCATCGATCGACATCGACTCATCCAAATTTTGAAGGAAGAGATCGACGAT  
CCATCGACCGACATCGACTCATCUCAATCTTTAAGGAAGAGATCGACGAT  
CCATCGACCGACATCGACTCATCUCAATCTTTAAGGAAGAGATCGACGAT  
CCATCGACCGACATCGACTCATCTCAATCTTTAAGGAAGAGATCGACGAT  
CCATCGACCGGACATCGACTCATCTCAATCTTTAAGGAAGAGATCGACGAT  
CCATCGACCGACATCGACTCATCUCAATCTTTAAGGAAGAGATCGACGAT  
CCATCGACCGACATCGACTCATCUCAATCTTTAAGGAAGAGATCGACGAT  
CCATCGACCGACATCGACTCATCUCAATCTTTAAGGAAGAGATCGACGAT  
CCATCGACCGGACATCGACTCATCTCAATCTTTAAGGAAGAGATCGACGAT  
CCATCGACCGGACATCGACTCATCTCAATCTTTAAGGAAGAGATCGACGAT  
CCATCGACCGGACATCGACTCATCTCAATCTTTAAGGAAGAGATCGACGAT  
CCATCGACCGGACATCGACTCATCTCAATCTTTAAGGAAGAGATCGACGAT  
CCATCGACCGGACATCGACTCATCTCAATCTTTAAGGAAGAGATCGACGAT  
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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR

CCCAAGTTCTTTTACTUACATTCAGAAAAGTATTTTCCGCCGGACGACTCGT  
CCCAAGTTCTTTTACTCCATTCATAAAGTCTTTTCCGCCGGACGACTCGT  
CCCAAGTTCTTTTACTCCATTCATAAAGTCTTTTCCGCCGGACGACTCGT  
CCCAAGTTCTTTTACTCCATTCATAAAGTCTTTTCCGCCGGACGACTCGT  
CCCAAGTTCTTTTACTCCATTCAGAAAAGTCTTTTCCGTCGGACGACTCGT  
CCCAAGTTCTTTTACTCCATTCATCAAGTCTTTTCCGCCGAGACGACTCGT  
CCCAAGTTCTTTTACTCCATTCAGAAAAGTCTTTTCCGCCGGACGACTCGT  
CCCAAGTTCTTTTACTCGATTCAGAAAAGTCTTTTCTGCCGGACGACTCGT  
CCCAAGTTCTTTTACTCGATTCAGAAAAGTCTTTTCTGCCGGACGACTCGT  
CCCAAGTTCTTTTACTCGATTCAGAAAAGTCTTTTCTGCCGGACGACTCGT  
CCCAAGTTCTTTTACTCCATTCAGAAAAGTCTTTTCCGCCGGACGACTCGT  
CCCAAGTTCTTTTACTCCATTCAGAAAAGTCTTTTCCGCCGGACGACTCGT  
TCCAAGTTCTTTTACTUUCACTCAGAAACAGTTTTCCGCCGGACGACTCGT  
CCCAAGTTCTTTTACTCCATTCAGAAAAGTCTTTTCCGCCGGACGACTCGT  
CCCAAGTTCTTTTACTCCATTCAGAAAAGTCTTTTCCGCCGGACGACTCGT



RRIM600\_matR  
Cycas taitungensis

CCCAAGTTCTTTTACTCCATTTCAGAAAGTCTTTTCCGCCGGACGACTCGT  
CCCAAGTTCTTTTACCCCACTCATAAACTGCTTTCCGCCGGACGACTTGT  
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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Milletia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

AGGAGTTGAGAGGGG---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGTTGAGAGGGG---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGG---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGG---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGG---CCCTTACTACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGG---CCCTGACTACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGG---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGG---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGG---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGG---AAAA---GACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGC---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGC---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGG---CCCT---GACTCCGTCCCAAACAGTGTACTAC  
AGGAGGTGAGAAGGC---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGC---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGC---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGC---CCCT---TACTCCGTCCCACACAGTGTACTAC  
AGGAGGTGAGAAGGGTGGCCGCCCTTCTCCGTCCCACACAGTGTACTAC  
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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Milletia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

TATCGGCCCTACUAGGCAACATCTACCTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACCTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACCTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACCTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACCAGGCAACATCTACCTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACCAGGCAACATCTACCTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACTTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACTTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACTTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACTTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACTTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACTTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACTTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACTTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTATTAGGCAATATCTACCTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACNAGGCAACATCTACCTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACUAGGCAACATCTACCTACACAAGCTCGATCAGGAGATA  
TATCGGCCCTACCAGGCAACATCTACCCACACAAGCTCGATCAGGAGATG  
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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Milletia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAGTCAGATC  
GGGAGGATCCGACAGAAGTATGAAATTCCGATTGTTTCAGAGAGTCAGATU  
GGAAGGATCCGACAAAAGTACGAAATTCCGA-----GAATAAGATC  
GGAAGGATCCGACAAAAGTACGAAATTCCGA-----GAATAAGATC  
GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATU  
GGGAGGATCCAACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATC  
GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATC  
GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATU  
GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATU  
GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATU  
GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATU  
GGAAGGATCCGACAGAAGTACGAAATTCCTATTGTTTCAGAGAATCAGATU  
GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATC  
GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATC  
GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATC  
GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATC  
GGGAGGATCCGACAGAAGTACGAAATTCCGATTGTTTCAGAGAATCAGATC  
GAGAGGATCCGACAGAAGCAGGAAATTCGATTGTTTCAGATAATCAAAT

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*Arabidopsis thaliana*  
*Brassica napus*  
*Lotus japonicus*  
*Millettia pinnata*  
*Citrullus lanatus*  
*Cucurbita pepo*  
RRIC110\_matR  
*Beta macrocarpa*  
*Beta vulgaris maritima*  
*Beta vulgaris vulgaris*  
*Silene latifolia*  
BPM24\_matR  
PB235\_matR  
*Zea mays* mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
*Cycas taitungensis*

GGTTCTATTAAGGACAGGTCGTCGTATTGATG-----  
GGTTCTATTAAGGACAGGTCGTCGTATTGATG-----  
GGTTCTATTAAGGACAGGTC---GTATTGATG-----  
GGTTCTATTAAGGACAGGTC---GTATTGATG-----  
GGTTCTATTAAGGACAGGTC---GTATTGATG-----  
GGTTCTATTAAGGACAGGT-----GATG-----  
GGTTCTATTAAGGACAGGTC---GTATTGATG-----  
GGTTCTATTAAGGACAAAGTC---GTATTGATG-----  
GGTTCTATTAAGGACAAAGTC---GTATTGATG-----  
GGTTCTATTAAGGACAAAGTC---GTATTGATG-----  
GGTTCTATTAAGGACAAAGTC---GTATTGATG-----  
GGTTCTATTAAGGACAGGTC---GTATTGATG-----  
GGTTCTATTAAGGACAGGTC---GTATTGATG-----  
GGTTCTATTAAGAATAGGTCGTCGTATTGATG-----  
GGTTCTATTAAGGACAGGTCGT---ATTGATG-----  
GGTTCTATTAAGGACAGGTC---GTATTGATG-----  
GGTTCTATTAAGGACAGGTC---GTATTGATG-----  
GGTTCCATTAAGGACAGGTC---GTATTGATG-----  
\*\*\*\*\* \*\*\*\*\* \* \* \*\* \*\*\*\*

*Arabidopsis thaliana*  
*Brassica napus*  
*Lotus japonicus*  
*Millettia pinnata*  
*Citrullus lanatus*  
*Cucurbita pepo*  
RRIC110\_matR  
*Beta macrocarpa*  
*Beta vulgaris maritima*  
*Beta vulgaris vulgaris*  
*Silene latifolia*  
BPM24\_matR  
PB235\_matR  
*Zea mays* mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
*Cycas taitungensis*

---ACCAAGAAAACCTGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGAC  
---ACCAAGAAAACCTGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGAC  
---ACCAAGAAAACCTGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGAC  
---ACCAAGAAAACCTCAGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGAC  
---ACCAAGAAAACCTGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGAC  
---ACCAATCAAACCTCGGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGAC  
---ACCAAGAAAATTCTGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGGC  
---ACCAAGAAAACCTGGAGAAGAAGAAAGCTTCAACGCTCCACAAGAC  
---ACCAAGAAAACCTGGAGAAGAAGAAAGCTTCAACGCTCCACAAGAC  
---ACCAAGAAAACCTGGAGAAGAAGAAAGCTTCAACGCTCCACAAGAC  
ATGACCAAGAAAACCTGGAGAAGAAGAAAGCTTCAACGCTCCCCAAGAC  
---ACCAAGAAAATTCTGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGGC  
---ACCAAGAAAATTCTGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGGC  
---ACCAAGAAAAGTATGGAAAAGAAGCAAGCTTCAACGCTCCCCAAGAC  
---ACCAAGAAAATTCTGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGGC  
---ACCAAGAAAATTCTGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGGC  
---ACCAAGAAAATTCTGGAGAAGAAGCAAGCTTCAACGCTCCCCAAGGC  
---ACCAAGAAAACCTGGAGAAGAAGCAAGCTTCAACTCTCCGGAGAC  
\*\*\*\*\* \*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\* \*

*Arabidopsis thaliana*  
*Brassica napus*  
*Lotus japonicus*  
*Millettia pinnata*  
*Citrullus lanatus*  
*Cucurbita pepo*  
RRIC110\_matR  
*Beta macrocarpa*  
*Beta vulgaris maritima*  
*Beta vulgaris vulgaris*  
*Silene latifolia*  
BPM24\_matR  
PB235\_matR  
*Zea mays* mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
*Cycas taitungensis*

AACAGAGCCATCATTGTGGGGAGCGTTAAGAGCATGCAACGCAAAGCGGC  
AACAGAGCCATCATTGTGGGGAGCGTTAAGAGCATGCAACGCAAAGCGGC  
AACAGAGCCATCATTGTGGGCAGGGTCAAGAGCATTCAACGCAAAGCGGC  
AACAGAGCCATCATTGTGGGCAGGGTCAAGAGCATTCAACGCAAAGCGGC  
TACAGAGCCCTCATTATGGGGAGGGTAAAGAGCTTCCAACGCAAAGCGGC  
TACAGAGCCCTCATTATGGGGAGGGTAAAGAGCTTCCAACGCAAAGCGGC  
AACAGAGCCATTATTGTGGGGAGGGTAAAGAGCATCCAACGCAAAGCGGC  
AACAGAGCCATCATTGTGGATAGGGTAAAAAGCATCCAACGCAAAGCGGC  
AACAGAGCCATCATTGTGGATAGGGTAAAAAGCATCCAACGCAAAGCGGC  
AACAGAGCCATCATTGTGGATAGGGTAAAAAGCATCCAACGCAAAGCGGC  
AACAGAGCCATCATTGTGGATAGGGTAAAAAGCATCCAACGCAAAGCGGC  
AACAGAGCCATTATTGTGGGGAGGGTAAAGAGCATCCAACGCAAAGCGGC  
AACAGAGCCATTATTGTGGGGAGGGTAAAGAGCATCCAACGCAAAGCGGC  
AACAGAGCCATTATTGTGGGGAGGGTAAAGAGCATCCAACGCAAAGCGGC  
AACAGAGCCATTATTGTGGGGAGGGTAAAGAGCATCCAACGCAAAGCGGC  
AACAGAGCCATCGTTGTGGGGAGGGTAAAAAGCATCCAGCGCAAAGCGGC  
\*\*\*\*\* \* \* \*\* \* \* \* \* \* \* \* \* \* \* \*



Lotus japonicus CTTCTTCAT-----AGAAGCCGCCGGGTTGACCCCGAAG--GCCGAAT  
Millettia pinnata CTTCTTCAT-----AGAAGCCGCCGGGTTGACCCCGAAG--GCCGAAT  
Citrullus lanatus CTTCTTCAT-----AGAAGCCGCCGGGTTGACCCCTCAG--GCCGAAT  
Cucurbita pepo CTTCTTCAT-----AGAAGCCGCCGGGTTGACCCCTCAG--GACGAAT  
RRIC110\_matR CTTCTTCAT-----GGAATCCGCCGGTTTGACCCCGAAG--GCCGAAT  
Beta macrocarpa GTTCCTCAT-----AGAAGCCGCCGGGTTGACCCCGAAG--GCCGAAT  
Beta vulgaris maritima GTTCCTCAT-----AGAAGCCGCCGGGTTGACCCCGAAG--GCCGAAT  
Beta vulgaris vulgaris GTTCCTCAT-----AGAAGCCGCCGGGTTGACCCCGAAG--GCCGAAT  
Silene latifolia CTTACTCAT-----AGAAGCCCCGGGTTGACCCCGAAG--GCCGAAT  
BPM24\_matR CTTCTTCAT-----GGAATCCGCCGGTTTGACCCCGAAG--GCCGAAT  
PB235\_matR CTTCTTCAT-----GGAATCCGCCGGTTTGACCCCGAAG--GCCGAAT  
Zea mays mays CTTCTTCAT-----AGAAGCCGCTGGGTTGACCCCGAAG--GCCGAAT  
RRIT251\_matR CTTCTTCAT-----GGAATCCGCCGGTTTGACCCCGAAG--GCCGAAT  
RRII105\_matR CTTCTTCAT-----GGAATCCGCCGGTTTGACCCCGAAG--GCCGAAT  
RRIM600\_matR CTTCTTCAT-----GGAATCCGCCGGTTTGACCCCGAAG--GCCGAAT  
Cycas taitungensis CTTCTTCATTTCGTAAGAAGCCGCCGGGTTGACCCCGGAACGAAGAAAGG

\*\* \*\*\*\* \*\* \* \* \*\* \* \*\* \* \* \* \* \*\* \* \*

Arabidopsis thaliana TCTATGGTGAGAACGCTG-----TAATAATAATTGGG-----  
Brassica napus TCTATGGTGAGAACGCTG-----TAATAATAATTGGG-----  
Lotus japonicus TCTATGGTAGAGAATGCTGCT---TTAATAATAATTTGG-----  
Millettia pinnata TCTATGGTAGAGAAT-----TTAATAATAATTGGG-----  
Citrullus lanatus TCTATGGTCGAGAACGCTG-----TAATAAGAAATTGG-----  
Cucurbita pepo TCTATGGTCGAGAACGCTG-----TAATAAGAAATTGG-----  
RRIC110\_matR TCTATGGTAGAGAACGCTG-----TAATAATAATTGGG-----  
Beta macrocarpa TCTATGGTAGAGAATGCTG-----TAATAATAATTGGG-----  
Beta vulgaris maritima TCTATGGTAGAGAATGCTG-----TAATAATAATTGGG-----  
Beta vulgaris vulgaris TCTATGGTAGAGAATGCTG-----TAATAATAATTGGG-----  
Silene latifolia TCTATGGTAGAGAATGCTT-----TCATAATAATTGGG-----  
BPM24\_matR TCTATGGTAGAGAACGCTG-----TAATAATAATTGGG-----  
PB235\_matR TCTATGGTAGAGAACGCTG-----TAATAATAATTGGG-----  
Zea mays mays TCAATGGTAGAGAAGGCTT-----TAATAAGAAATTTGG-----  
RRIT251\_matR TCTATGGTAGAGAACGCTG-----TAATAATAATTGGG-----  
RRII105\_matR TCTATGGTAGAGAACGCTG-----TAATAATAATTGGG-----  
RRIM600\_matR TCTATGGTAGAGAACGCTG-----TAATAATAATTGGG-----  
Cycas taitungensis CCGAAGGTAGAGAACGCCCTTTATCTAATAAGAAGAAGAACAGGGTAGCG

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Arabidopsis thaliana ----CCATGAGAGACCTTCTTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
Brassica napus ----CCATGAGAGACCTTCTTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
Lotus japonicus ----CCATGAGAGACCTTATTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
Millettia pinnata ----CCATGAGAGACCTTATTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
Citrullus lanatus ----CCATGAGAGACCTTTTTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
Cucurbita pepo ----CCATGAGAGACCTTTGAGAAGTATTACAAAAGAAAAGGACTGATGAT  
RRIC110\_matR ----CCATGAGAGACCTTATTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
Beta macrocarpa ----CCATGAGAGACCTTTTTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
Beta vulgaris maritima ----CCATGAGAGACCTTTTTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
Beta vulgaris vulgaris ----CCATGAGAGACCTTTTTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
Silene latifolia ----CCATGAGAGACCTTTTTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
BPM24\_matR ----CCATGAGAGACCTTATTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
PB235\_matR ----CCATGAGAGACCTTATTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
Zea mays mays ----CCATGAGAGACCTTCTTAAGTATTGCAAAAAGAAAGGGCCCGCTGAT  
RRIT251\_matR ----CCATGAGAGACCTTATTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
RRII105\_matR ----CCATGAGAGACCTTATTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
RRIM600\_matR ----CCATGAGAGACCTTATTAAGTATTGCAAAAAGAAAGGGCCTGCTGAT  
Cycas taitungensis TTCTCCATGAAAGACCTTATTAAGTATTGCAAGAGAAGGGCCTGCTGAT

\*\*\*\*\* \*\* \* \* \*\*\*\*\* \*\* \* \* \* \* \* \* \*

Arabidopsis thaliana AGAGCTGGGCGGGGAGGCGATACTAGTTATCAGGTTCAGAGAGAGGCCTGG  
Brassica napus AGAGCTGGGCGGGGAGGCGATACTAGTTATCAGGTTCAGAGAGAGGCCTGG  
Lotus japonicus AGAGCTGGGCGGGGAGGCGAGACTGGTTATCAGGTTCAGAGAGAGGCCTGG  
Millettia pinnata AGAGCTGGGCGGGGAGGCGAGACTAGTTATCAGGTTCAGAGAGAGGCCTGG





Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

TCCGAAGACGACTCCCATACAATTTTTGCGAGAGCTGGAGAAGCGTCTAC  
TCCGAAGACGACTCCCATACAATTTTTGCGAGAGCTGGAGAAGCGTCTAC  
TCCGAAGACGACTCCCATACAATTTTTCGAGAGCTGGAGAAGCGTCTAC  
TCCGAGGACGACCCCCATAACAATTTTCGAGAGCTGGAGAAGCGTCTAC  
TCCGAGGACGACCCCCATAACAATTTTCGAGAGCTGGAGAAGCGTCTAC  
CCCAGGACGACTCCCATACAATTTTTCGAGAGCTGGAGAAGCGTCTAC  
TCCGAGGACGACCCCCATAACAATTTTCGAGAGCTGGAGAAGCGTCTAC  
TCCGAGGACGACCCCCATAACAATTTTCGAGAGCTGGAGAAGCGTCTAC  
TCCGAGGACGACCCCCATAACAATTTTCGAGAGCTGGAGAAGCGTCTAC  
TCCGAGGACGACTCCCATACAATTTTCGAGAGCTGGAGAAGCGTCTAC  
\*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\*

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Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTCCGCCATC  
GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTCCGCCATC  
GGGTAAAGCACCGTATCCATATAACTGTTTGCCACCTACGCTCCGCCATC  
GGGTAAAGCACCGTATCCATATAACTGTTTGCCACCTACGCTCCGCCATC  
GGGTAAAGCACCGTATCCATATAACAGCTTGCCACCTACGCTCCGCCATC  
GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTACGCCATC  
GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTCCGCCATC  
GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTCTGCCATT  
GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTCTGCCATT  
GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTCTGCCATT  
GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTCTGCCATT  
GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTCTGCCATT  
GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTCTGCCATT  
GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTCTGCCATT  
GGGTAAAGCACCGTATCCATATAACTGCTTGCCACCTACGCTCTGCCATT  
GAGTAAAGCACCGTATCCATCTCACAGCTCCCCACCTACGCTCCGCCATC  
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Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

CATTCAAAGTTTAGGAACCTAGGTGATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAATCTAGGTGATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGGAAGGGGATACCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGGAATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAAGAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAATATCCCGATAAAAGAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAACAGCTGAC  
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CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAACAGCTGAC  
CATTCAAAGTTTAGGAACCTAGGTAATAGTATCCCGATCAAACAGCTGAC  
\*\*\*\*\* \* \* \* \* \*\* \* \* \*

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Milletia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris

GAAGGGGATGAGCAAAACAGGGAGTCTACAGGACGGGGTTCAACTAGCGG  
GAAGGGGATGAGCAAAACAGGGAGTCTACAGGACGGGGTTCAACTAGCGG  
GAAGGGGATGAGCGAAAGAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAAGGGGATGAGCGAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAAGGGGATGAGCGAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAAGGGGATAAGCCAAAGAGGGAGTCTACTGGACGGGGTTCAACTAGCAG  
GAAGGAGATGAGCGAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAAGGGGATGAGCGAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAAGGGGATGAGCAAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAAGGGGATGAGCGAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAAGGGGATGAGCGAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG

Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

GAAGGGGATGAGCAAAACAAGGAGTCTACTGGACGCGGTTCAACTAGCGG  
GAAGGAGATGAGCGAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAAGGAGATGAGCGAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAAGGGGATGAGCGGAAGAGGTCGTCTACTGGACGCGGTTCAACTAGCGG  
GAAGGAGATGAGCGAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAAGGAGATGAGCGAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAAGGAGATGAGCGAAACAGGGAGTCTACTGGACGGGGTTCAACTAGCGG  
GAGGGGGATGAGCGGAACAGGGAGTCTACAGGACGCGGTTCAACTGGCGG  
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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

AGACTCTTGAACAGCTGGAGTCAGAAGTCCCCAAGTTAGCG-----TA  
AGACTCTTGAACAGCTGGAGTCAGAAGTCCCCAAGTTAGCG-----TA  
AGACTCTTGAACAGCTGGAGTCAGAAGTCCCCAAGTAAGCG-----TA  
AGACTCTTGAACAGCTGGAGTAAGAAGTCCCCAAGTAAGCG-----TA  
AGACTCTTGAACAGCTGGAGTAATCCGTCCCCAAGTGAGCG-----TA  
AGACTCTTGAACAACACTGGAGTAAGAAGTCCCCAAGCGAGCG-----TA  
AAAGTCTTTCCACAGCTAGAGTAAGAAGTCCCCAAGTGAGCG-----TA  
AAAGTCTTTCCACAGCTAGAGTAAGAAGTCCCCAAGTGAGCG-----TA  
AAAGTCTTTCCACAGCTAGAGTAAGAAGTCCCCAAGTGAGCG-----TA  
AAAGTCTTTCCACAGCTAGAGTAAGAAGTCCCCAAGTGAGCG-----TA  
AAAGTCTTTCCACAGCTAGAGTAAGAAGTCCCCAAGTGAGCG-----TA  
AAACTCTTGAACAGCTAGAGTAAGAAGCCCCAAGTGAGCA-----TA  
AGACTCTTGAACAACACTGGAGTAAGAAGTCCCCAAGCGAGCG-----TA  
AGACTCTTGAACAACACTGGAGTAAGAAGTCCCCAAGCGAGCG-----TA  
AGACTCTTGGAAAAG-----AAAGTCCCCAAGTTAGCG-----TA  
AGACTCTTGAACAACACTGGAGTAAGAAGTCCCCAAGCGAGCG-----TA  
AGACTCTTGAACAACACTGGAGTAAGAAGTCCCCAAGCGAGCG-----TA  
AGACTCTTGAACAACACTGGAGTAAGAAGTCCCCAAGCGAGCG-----TA  
AGACTCTTGAACAGCTGGAGTAAGAAGTCCCCGAGTGAGCGGAGCGTA  
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Arabidopsis thaliana  
Brassica napus  
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Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

TTATGGGGGACCGTCAAGCACATCCGGCAAGGA---TCAAGGGGGATCTC  
TTATGGGGGACCGTCAAGCACATCCGGCAAGGCGTTCCTCGGGGGATCTC  
TTATGGGGGACCGTCCAGCACATCTGGCAAGGA---TCAAGGGGGATCTC  
TTATGGGGGACCGTCCAGCACATCTGGCAAGGA---TCAAGGGGGATCTC  
TTATGGGGGACCGTCAAGCACATCCGGCAAGGA---TCAAGGGGGATCTC  
TTATGGGGGACCGTAAAGCACATCCGGCAAGGA---TCAAGGGGGATCTC  
TTATGGGAGACCGTCAAGCACATCCGGCAAGGA---TCAAGGGAGATCTC  
TTATGGGAGACCGTCAAGCACATCCGGCAAGGA---TCAAGGGAGATCTC  
TTATGGGAGACCGTCAAGCACATCCGGCAAGGA---TCAAGGGAGATCTC  
TTATGGGGGACCGTAAAGCACATCCGGCAAGGA---TCAAGGGGGATCTC  
TTATGGGGGACCGTAAAGCACATCCGGCAAGGA---TCAAGGGGGATCTC  
TTATGGGGGACCGTAAAGCACATCCGGCAAGGA---TCAAGGGGGATCTC  
TTATGGGGGACCGTAAAGCACATCCGGCAAGGA---TCAAGGGGGATCTC  
TTATGGGGGACCGTAAAGCACATCCGGCAAGGA---TCAAGGGGGATCTC  
TTATGGGGGACCGTAAAGCACATCCGGCAAGGA---TCAAGGGGGATCTC  
TTATGGGAGACCGTCAAGCACATCCGGCAAGGA---TCAAGGGAAATCTT  
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Arabidopsis thaliana  
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Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR

GTTCTTGCATAGCTCAGGTCGGAGCAACGCGTCATCGGACGTTCAACAGG  
GTTCTTGCATAGCTCAGGTCGGAGCAACGCGTCATCGGACGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCGGAGCAACGCGCCATCGGACGTTCAAGAGG  
GTTGTTGCATAGCTCAGGTCGGAGCAAGGCGCCATCGGACGTTCAAGAGG  
GTTGTTGCATAGCTCAGGTCGTAGCAACGCGCCATCGGACGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCGGAGCAAGGCCCCATCGGACGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCGGAGCAAGGCGCCATCGGACGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCAGAGCAAGGTGCCATCGGACGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCAGAGCAAGGTGCCATCGGACGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCAGAGCAAGGTGCCATCGGACGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCAGAGCAAGGTGCCACCGGACGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCGGAGCAAGGCGCCATCGGACGTTCAACAGG



PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

GTTGTTGCATAGCTCAGGTCGGAGCAAGGCGCCATCGGACGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCAGAGCAAGGTGCCATCAGGCGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCGGAGCAAGGCGCCATCGGACGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCGGAGCAAGGCGCCATCGGACGTTCAACAGG  
GTTGTTGCATAGCTCAGGTCGGAGCAAGGCGCCATCGGACGTTCAACAGG  
GTTGTTGCATAGCCCAGGTCGGAGCAACGTGCCATCAGACGTTCAACAGG  
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Arabidopsis thaliana  
Brassica napus  
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Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

TAGTCTCACGATCGGGCA-----CTCATGCCCGTAAGTTGTC---ATTG  
TAGTCTCACGATCGGGCA-----CTCATGCCCGTAAGTTGTC---ATTG  
CAGTCGCACGATCGGGCA-----TGAGTGCCCGGAAGTTCTC---ATTG  
CAGTCGCACGA-----AGTGTCCGGAAGTTGTC---ATTG  
CAGTTTCACGATCGGGCA-----TGAGTGCCCGGAAGTTGTC---ATTG  
CAGTTTCACGATCGGGCA-----TGAGTGACGGGAAGTTGTC---ATTG  
CAGTCTCACGATCGGGCA-----TGAGTGTCCGGAAGTTGTC---ATTG  
CAGTCTTGCATCGGGCA-----TGAGTGTCCGGAAGTTGTC---ATTG  
CAGTCTTGCATCGGGCA-----TGAGTGTCCGGAAGTTGTC---ATTG  
CAGTCTTGCATCGGGCA-----TGAGTGTCCGGAAGTTGTC---ATTG  
CAGTCTTGCATCGGGCA-----TGAGTGTCCGGAAGTTGTC---ATTG  
TAGTCTCGCGATCGGGCA-----TGAGTGCCCGGAAGTTGTCGGA AAAA  
CAGTCTCACGATCGGGCA-----TGAGTGTCCGGAAGTTGTC---ATTG  
CAGTCTCACGATCGGGCA-----TGAGTGTCCGGAAGTTGTC---ATTG  
CAGTCTCACGATCGGGCA-----TGAGTGTCTGAAGAATAA---ATTG  
CAGTCTCACGATCGGGCA-----TGAGTGTCCGGAAGTTGTC---ATTG  
CAGTCTCACGATCGGGCA-----TGAGTGTCCGGAAGTTGTC---ATTG  
CAGTCTCACGATCGGGCA-----TGAGTGTCCGGAAGTTGTC---ATTG  
CAGTCTCACGATCGGGCAAATCGTTGAGCGTCTGGAAGTTGTC---ATTG  
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Arabidopsis thaliana  
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Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

TATACTCCC-----CCGGGTCGGAAGGCGGCGGGGGAGGGAGG  
TATACTCCC-----CCGGGTCGGAAGGCGGCGGGGGAGGGAGG  
TATACTCCC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCCC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCCC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCCT-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCCC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCTC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCTC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCTC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCTC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
GAGACTCTC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCCC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCCC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCCC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCCC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
TATACTCCC-----GCGGGTCGGAAGGCGGCGGGGGAAAGGAGG  
CATACTCCCAGAGAAGCGCTGGGAGGTCGGAAGGCGGCGGGGGAAAGGAGG  
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Arabidopsis thaliana  
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Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays

AGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCCATAAAGA  
AGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCCGTAAGA  
AGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCCATACAGA  
AGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCCATACAGA  
AGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCCATACATC  
AGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCCATACATC  
AGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCUATACAGA  
GGGACACTGGT-----CGAGATCTATCAGCAGCGAATTCCCCATACAGA  
GGGACACTGGT-----CGAGATCTATCAGCAGCGAATTCCCCATACAGA  
GGGACACTGGT-----CGAGATCTATCAGCAGCGAATTCCCCATACAGA  
GGGACACTGGT-----CGAGATCTATCAGCAGCGAATTCCCCATACAGA  
GGGACACTGGG-----CGAGATCTATCAGCAGCGAATTCCCCATACAGA  
GGGACACTGGG-----CGAGATCTATCAGCAGCGAATTCCCUATACAGA  
GGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCUATACAGA  
GGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCCATACAGA

RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

AGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCUATACAGA  
AGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCUATACAGA  
AGGACACTGGG-----CGGGATCTATCAGCAGCGAATTCCCNATACAGA  
GGGACACTGGGAACAGACGGGATCTTTTCAGCAGCAAATTACCCATACAGA  
\*\*\*\*\* \*

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

TAGAGGCACCTATAAAAAAGATACTCCGAAGGCTTCGGGATCGAGGTATC  
TAGAGGCACCTATAAAAAAGATACTCCGAAGGCTTCGGGATCGAGGTATC  
TAGAGGCGCCTATCAAAAAGATACTCCGAAGGCTTCGGGATCGAGGTATC  
TAGAGGCGCCTATCAAAAAGATACTCCGAAGGCTTCGGGATCGAGGTATC  
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TCGAGGCGCCTATCAAAAAGATACTCCGAAGGCTTCGGGATCGAGGTATC  
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TAGAGGCGCCTATCAAAAAGATACTCCGAAGGCTTCGGGATCGAGGTATC  
TAGAGGCGCCTATCAAAAAGATACTCCGAAGGCTTCGGGATCGAGGTATC  
TAAAGGCGCCTATGAAAAAGATACTCCAAAGGCTTCGGGATCGAGGTATC  
\* \*

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

ATTAGCCGAAGAAGACCCCTGGCCAATCCACGTGGCCTGTTTGACGAACGT  
ATTAGCCGAAGAAGACCCCTGGCCAATCCACGTGGCCTGTTTGACGAACGT  
ATTAGCCGAAGAAGACCCCTGGCCAATCCACGTGGCCTGTTTGACGAACGT  
ATTAGCCGAAGAAGACCCCTGGCCAATCCACGTGGCCTGTTTGACGAACGT  
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ATTAGCCGAAGAAGACCCCTGGCCAATCCACGTGGCCTGTTTGACGAGCGT  
ATTAGCCGAAGAAGACCCCTGGCCAATCCACGTGGCCTGTTTGACGAGCGT  
ATTAGCCGAAGAAGACCCCTGGCCAATCCACGTGGCCTGTTTGACGAGCGT  
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ATTAGCCGAAGAAGACCCCTGGCCAATCCACGTGGCCTGTTTGACGAACGT  
ATTAGCCGAAGAAGACCCCTGGCCAATCCACGTGGCCTGTTTGACGAACGT  
\*\*\*\*\* \*

Arabidopsis thaliana  
Brassica napus  
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Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR

CAGCGACGAAGACATCGTAAATTGGTUCGCGGGCATCGCGATAAGTCUTC  
CAGCGACGAAGACATCGTAAATTGGTUCGCGGGCATCGCGATAAGTCUTC  
CAGCGACGAGACATCGTAAATTGGTUTGCGGGCATCGCGATAAGTCUTC  
CAGCGACGAGACATCGTAAATTGGTUCGCGGGCATCGCGATAAGTCUTC  
CAGCGACGAGACATCGTAAATTGGTUCGCGGGCATCGCAATAAGTCCTC  
CAGCGACGAGACATCGTAAATTGGTUCGCGGGCATCGCAATCAGTCTC  
CAGCGACGAGACATCGTAAATTGGTCCGCGGGCATCGCGATAAGTCCTC  
CAGCGACGAGACATCGTAAATTGGTUCGCGGGCATCGCGATAAGTCUTC  
CAGCGACGAGACATCGTAAATTGGTUCGCGGGCATCGCGATAAGTCUTC  
CAGCGACGAGACATCGTAAATTGGTUCGCGGGCATCGCGATAAGTCUTC  
CAGCGACGAGACATCGTAAATTGGTUCGCGGGCATCGCGATAAGTCUTC  
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CAGCGACGAGACATCGTAAATTGGTCCGCGGGCATCGCGATAAGTCCTC  
CAGCGACGAGACATCGTAAATTGGTUCGCGGGCATCGCGATAAGTCUTC  
CAGCGACGAGACATCGTAAATTGGTCCGCGGGCATCGCGATAAGTCCTC  
CAGCGACGAGACATCGTAAATTGGTCCGCGGGCATCGCGATAAGTCCTC



\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\* \*\*\*\*\* \* \*\*\*\* \*

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
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Cucurbita pepo  
RRIC110\_matR  
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Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

TAAATCAAGAAGGTGGCAAGATCCTTGAGAGTTCCTCAACAGCATAGAG  
TAAATCAAGAAGGTGGTAAGATCCTTGAGAGTTCCTCAACAGCATAGAG  
TAAATCAAGAAGGTGGTAAGACCCCTTGAGAGTTCCTCAACAGCATAGAG  
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TAAATAAAGAAGGTGGTAAGACCCCTTGAGAGTTCCTCAACAGCATAGAG  
TCAATAAAGAAGGTGGTAAGACCCCTGCCGAGTTCCTCAACAGCATAGAG  
\* \*\*\* \*\*\*\*\* \*\* \*\* \*\* \*\* \*\* \*\* \*\* \*\* \*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
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Cucurbita pepo  
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Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

CTTGGGAAGCTCGGACCCGGTCAAGACCTGAACAAGAA-GGAACACTCAA  
CTTGGGAAGCTCGGACCCGGTCAAGACCTGAACAAGAA-GGAACACTCAA  
CTTGGGAAGCTCGGACCCGGTCAAGATCCGAACAACAA-GGAGCACTCCA  
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CTTGGGAAGCTCGGACCCGGTCAAGATCCGAACCACTA-CTAG-ACTAGA  
CTTGGGAAGCTCGGACCCGGTCAAGATCCGAACCACTA-CTAG-ACTAGA  
CTTGGGAAGCTCGGACCCGGGCAAGATCCGAACAACAA-GGAGCACTCAA  
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CTTGGGAAGCTCGGACCCGGGCAAGATCCGAACAACAA-AGAGCACTCAA  
CTTAGGAAGCTCGGACCCAGAGTCAATCCTTACAAGTCAAGATCTGAACAA  
\*\*\* \* \*\*\*\*\* \* \* \* \* \*

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
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Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

CTACTAGTCTAGTCTAGTAGTCGTTTTTTCTATTAGTTGCGATGCGAAC  
CTACTAGTCTAGTCTAGTAGTCGTTTTTTCTATTAGTTGCGATGCGAAC  
CTACTAGTCTAGTC-----GTT-TTTTT--CTATTAGTTGCGATGCGAAC  
CTACTAGTCTAGTC-----GTT-TTTTTTTCTATTAGTTGCGATGCGAAC  
CTAGTCGTTGAGTGACGTAGTGGTTTTTT-CTATTAGTTGCGATGCGAAC  
C-----GTTGAGTGAGGTAGTGGTTTTTT-CTATT-----  
CTACTAGTCTAGTCTAG-----  
CTACTAGTCTAGTCTAGTAGTT-TTTTTTTCTAAAAGTTGCGATGTGAAC  
CTACTAGTCTAGTCTAGTAGTT-TTTTTTTCTAAAAGTTGCGATGTGAAC  
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CTACTAGTCTAGTCTAG-----  
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CTACTAGTCTAGTC---TAG-----  
CTACTAGTCTAGTCTAG-----  
CTACTAGTCTAGTCTAG-----  
CAAGGAGCACGCGTACAAGACCTTATATUAGGTGTACATGCGATATGTAC  
\* \* \*

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

AGGCGTTTACTTATGAGATTAGTTGAGTAGACTTGCCTGAGTTGTCTGCT  
AGGCGTTTACTTATGAGATTAGTTGAGTAGACTTGCCTGAGTTGTCTGCT  
AGGCGTTTACTTATGAGATTGTTGAGTAGGCTTGCCTGAGTTGTCTGCT  
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AGGCGTTTACTTATGAGATTTGTTGAGTAGGCTTGCCTTAGTTGTCTGCT  
-----GAGATTTGTTGAGTAAGCTTGCCTTAGTTGTCCGCT  
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AGACCTTTACTTATGACAGGT-TGGTTTGAGGACCCCTTGGTCAAAGGAA  
AGACCTTTACTTATGACAGGT-TGGTTTGAGGACCCCTTGGTCAAAGGAA  
AGACCTTTACTTATGACAGGT-TGGTTTGAGGACCCCTTGGTCAAAGGAA  
AGACCTTTACTTATGAT--CT-TAGTTTAGTATTCCCTTGGTCAAAGAAA  
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AGGCGTTTAC--ATGAGATTAGTTGAGTAGGCTTGCCTTAGTTGTCTGCT  
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GAAGCGTGATCTATCGGTCTGAACCGTTGTTGCGCGGGGGGGTGTGGGGA

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

ATAAGATAGAGCTAGTTTTGGGGTAGGGCTTTTGACATAAAAAAGCCGGA  
ATAAGATAGAGCTAGTTTTGGGGTGGGGCTTTTGACATAAAAAAGCCTAT  
ATAAGATAG--CTAGTTTTGGGGCTTTGACATAA-ATCAAAAAGCCTAT  
ATAAGATAG--CTAGTTTTGGGGCTTTGACATTA-ATAAAAAAGCCTAT  
ATAAGATAG--CTAGTTTTGGGGC----TTTCGACATAAAAAAGCCGAT  
ATAAGATAG--CTAGTTTTGGGGC----TTTCGACATCAA-----GAT  
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AGAGGGAAACGGGGGAGTTGGCTGATAAAGATGGACAGTAAGGA-TTGCG  
AGAGGGAAACGGGGGAGTTGGCTGATAAAGATGGACAGTAAGGA-TTGCG  
AGAGGGAAACGGGGGAGTTGGCTGATAAAGATGGACAGTAAGGA-TTGCG  
GAAGGGTCGAAGTTGAGACCGCTCACAGTAAGTAGTTCTAAG-A-TCATC  
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ATAAGATAA-----GATAGCTAGTTGTGGTCGAAAAAAA-----GGC  
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GGGCGGCCCCACCCACCCTTGGATAGAGCATGCAG-ATGCGCCATGCATG

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo  
RRIC110\_matR  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_matR  
PB235\_matR  
Zea mays mays  
RRIT251\_matR  
RRII105\_matR  
RRIM600\_matR  
Cycas taitungensis

TAGGCTTGGCTTCGCTATCGCTC--ATGACTTGTATTGTAGTC-----  
CCGGCTTGGCTTCGCTATCGCTC--ATGACTTGTATTGTAGTC-----  
CCGGCTTGGCTTCGCTATCGCTC--ATGACTTGTATTGTAGTC-----  
CCGGCTTGGCTTCGCTATCGCTC--ATGACTTGTATTGTAGTC-----  
CCGGCTTGGCTTCGCTATCGCTC--ATGACTTGTATTGTAGTCCTAGTCT  
CCGGCTTGGCTTCGCTATCGCTC--ATGACTTGTATTGTAGTCCTAGTCT  
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TAATATCAATCGAATTATCACCC--TTT-CTTTTTTTATAACTTTGTT--  
TAATATCAATCGAATTATCACCC--TTT-CTTTTTTTATAACTTTGTT--  
TAATATCAATCGAATTATCACCC--TTT-CTTTTTTTATAACTTTGTT--  
AGAGAGGAGACAAGCCATTTATG--ATT-CCAGCCTAGAAGACTAGTT--  
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-----  
TGAA--GGCTTCGCTATCGCTC--ATGGCTTGTATTGTAGTCGTAGTCT  
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-----  
-----  
CAAGTTGGCCTTTTGGATCCTTTGCGTAACCGTTTCCGGAGGAGCTTCTC

Arabidopsis thaliana  
Brassica napus

-----GGCCCGAATGCCTUGGTAGTCTTT-----CTAATGCCTTC  
-----GGCCCGAATGCCTCGGTAGTCTTT-----CTAATGCCTTC

Lotus japonicus -----GGCCCGGAATGCCTTTGTAGTCTTT-TTAATGCTAATGCCTTC  
Milletia pinnata -----GGCCCGGAATGCCTTTGTAGTCTTT-TTAATGCTAATGCCTTC  
Citrullus lanatus TGTAGTCGGCCTGGAATGCCTTTGTAGTCTTT-CTAATGCTAATGCCTTC  
Cucurbita pepo TGTAGTCGGCCTGGAATGCCTTTGTAGTCTTTGCTAATGCGTCTGCCTTC  
RRIC110\_matR -----  
Beta macrocarpa ---TGAAAGAGCGGCCTATACTTG-GATTTTT-----GCTTTGCCTTA  
Beta vulgaris maritima ---TGAAAGAGCGGCCTATACTTG-GATTTTT-----GCTTTGCCTTA  
Beta vulgaris vulgaris ---TGAAAGAGCGGCCTATACTTG-GATTTTT-----GCTTTGCCTTA  
Silene latifolia ---AAAGGAATGGAAAGAATCATGCGATTTTT-----GATCTATCTTT  
BPM24\_matR -----  
PB235\_matR -----  
Zea mays mays TGTAGTCGGCCCTCCATGCCTCTTTAGTCTTT-CTAATCCTGAGGCCTTT  
RRIT251\_matR -----  
RRII105\_matR -----  
RRIM600\_matR -----  
Cycas taitungensis AATGTCTCGACGCATCCAACGCAAAAGTGTTT--GGACGGAGCGGAAAAC

Arabidopsis thaliana TTCCTTCATTCAATTTCTTTTAGTTGCGGTAGCTTCCGCGCCAGCAAGAT  
Brassica napus TTCCTTCATTCAATTTCTTTTAGTTGCGGTAGCTTCCGCGCCAGCAAGAT  
Lotus japonicus TTCCTTCATTCAATTTCTTTTAGTTGCGGCAGCTTCCGCGCCAGCAAGAT  
Milletia pinnata TTCCTTCATTCAATTTCTTTTAGTTGCGGCAGCTTCCGCGCCAGCAAGAT  
Citrullus lanatus TTCCTTCATTCAATTTCTTTTAGTTGCGGTAGCTCCGCGCCAGCAAGAT  
Cucurbita pepo TTCCTTCATTCAATTTGCTTTTAGTTGCGGTAGCTCCGCGCCAGCAAGAT  
RRIC110\_matR -----  
Beta macrocarpa TTT-GAGAAACTTGTCCCAAAAA--GGGCAAATACTTCTATTCTGAGT  
Beta vulgaris maritima TTT-GAGAAACTTGTCCCAAAAA--GGGCAAATACTTCTATTCTGAGT  
Beta vulgaris vulgaris TTT-GAGAAACTTGTCCCAAAAA--GGGCAAATACTTCTATTCTGAGT  
Silene latifolia TTC-TGCGTCCGTTTCTTACTTGCTCGCTAGTTTATTTAACTTTTGGG  
BPM24\_matR -----  
PB235\_matR -----  
Zea mays mays TTCCTTCATTCAATTTGCGGTAGCTTACGCGTCAGAAAAAGGCCTCCTTT  
RRIT251\_matR -----  
RRII105\_matR -----  
RRIM600\_matR -----  
Cycas taitungensis GCCCCTCAATCTCGTTCCAATAA-TGAAGAAGCCGGCCCCCTTCTTTTCC

Arabidopsis thaliana ACGGACAGCGAAGCCAAAGCAATACTAAACAAGCGAGAAAAGTC-----  
Brassica napus ACGGACAGCGAAGCCAAAGCAATACTAAACAAGCGAGAAAAGTC-----  
Lotus japonicus ACGGACGGCGAAGCCAAAGCAATACTAAACAAGCGAGAAAAGCCCTATAT  
Milletia pinnata ACGGACGGCGAAGCCAAAGCAATACTAAACAAGCGAGAAAAGCCCTATAT  
Citrullus lanatus ACAGACG-----  
Cucurbita pepo AGAGACGGCGAAGCCAAAGCAATACTAAACGAGC-----  
RRIC110\_matR -----  
Beta macrocarpa CTGCGCTTCTTACTCGCGCTCATTCTTTTTAAGG-----  
Beta vulgaris maritima CTGCGCTTCTTACTCGCGCTCATTCTTTTTAAGG-----  
Beta vulgaris vulgaris CTGCGCTTCTTACTCGCGCTCATTCTTTTTAAGG-----  
Silene latifolia CAGCAGCTTTACTTTATCCCTTTTTTACTGTCATCT-----  
BPM24\_matR -----  
PB235\_matR -----  
Zea mays mays CCGGCCCGGAAGATCGCTTCGCTTCTGGCGACTAGCTTCTACCC-----  
RRIT251\_matR -----  
RRII105\_matR -----  
RRIM600\_matR -----  
Cycas taitungensis AATAATTGATAAGGCACTATTCTTGATTGTATTGTATTGGGGAAAAGAT

Arabidopsis thaliana -----  
Brassica napus -----  
Lotus japonicus ATT-----  
Milletia pinnata ATTCGCCTAAACAACCTTATTGAAAACCTAAAGCGCTAACGAGCAAGAAAAC

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Citrullus lanatus -----
Cucurbita pepo -----
RRIC110_matR -----
Beta macrocarpa -----
Beta vulgaris maritima -----
Beta vulgaris vulgaris -----
Silene latifolia -----
BPM24_matR -----
PB235_matR -----
Zea mays mays -----
RRIT251_matR -----
RRII105_matR -----
RRIM600_matR -----
Cycas taitungensis TGC-----

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**nad1 multiple sequence alignment**

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BPM24_nad1 -----
RRIC110_nad1 -----
RRII105_nad1 -----
PB235_nad1 -----
RRIT251_nad1 -----
RRIM600_nad1 -----
Arabidopsis thaliana -----
Citrullus lanatus GAGTGAAAT-ATCATGATCGGGTCGACCAGGCCAG-----ATCATGAGTG
Cucurbita pepo CAGTGAAAT-ATCATGATCGGGTCGACCAGGCCAG-----ATCGTCAGTG
Beta macrocarpa GAGTCAAAT-ATCATGATCGGGTCGACCAGGCCAG-----ATCATGAGTG
Beta vulgaris vulgaris --GTCAAAT-ATCATGATCGGGTCGACCAGGCCAG-----ATCATGAGTG
Silene latifolia --GTA AAAAT-ATCATGATCGGGTCGACCAGGCCAG-----ATCATGAGTG
Millettia pinnata TCCTTCAAT-ATCATGATTGGGTCTACCAGGCCAG-----ATCATGAGTG
Vigna radiata TCCTTCAAT-ATCATGATTGGGTCTACCAGGCCAG-----ATCATGAGTG
Lotus japonicus --CTTCAAT-ATCATGATTGGGTCTACCAGGCCAG-----ATCATGAGTG
Brassica napus --CTTCAAT-ATCATGATTGGGTCTACCAGGCCAG-----ATCATGAGTA
Oryza sativa Japonica -----AGTGAATTTGATCGGGTCGACCAGGTCAGGCCCGATCATGAGTG
Zea mays parviglumis -----CAAT-AGTTTGATCGGGTCGACCAGGTCAGGCCCGATCATGAGTG
Cycas taitungensis GAGTGAAAT-ATCATGATCGGGTCGACCAGGCCAG-----ATCATGAGTG
Megaceros aenigmaticus -----
Phaeoceros laevis -----
Huperzia squarrosa -----

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BPM24_nad1 -----AUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
RRIC110_nad1 -----AUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
RRII105_nad1 -----AUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
PB235_nad1 -----AUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
RRIT251_nad1 -----AUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
RRIM600_nad1 -----ANGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
Arabidopsis thaliana -----AUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
Citrullus lanatus AATAGAAAATCGAAAAUGTACATAGCAGTCCCAGCTGAAATACTTGGAAAT
Cucurbita pepo AATAGAAAATCGAAAAUGTACATAGCAGTTCAGCTGAAATACTTGGAAAT
Beta macrocarpa AATAGAAAATCGAAAAUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
Beta vulgaris vulgaris AATAGAAAATCGAAAAUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
Silene latifolia AATAGAAAATCGAAAAUGTACATAGCTGTTCCAGCGAAATACTTGGAAAT
Millettia pinnata AATAGAAAATCGAAAAUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
Vigna radiata AATAGAAAATCGAAAAUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
Lotus japonicus AATAGAAAATCGAAAAUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
Brassica napus AATAAAAAATCGAAAAUGTACATAGCTGTTCCAGCTGAAATACTTGGAAAT
Oryza sativa Japonica AATAGAAAATCGAAAAUGTACATAGCTGTTCCAGCGAAATACTTTGTTT
Zea mays parviglumis AATAGAAAATCGAAAAUGTACATAGCTGTTCCAGCGAAATACTTTGTTT
Cycas taitungensis AATGGGAAAATCGAAAAUGTACATTGCTATTTTCAGCTGAAATACTTGGAAAT
Megaceros aenigmaticus ---ATGAAACTTTATAT---CATTGGTATTTTAGCAAAAATACTTGGAAAT

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Beta vulgaris vulgaris  
Silene latifolia  
Millettia pinnata  
Vigna radiata  
Lotus japonicus  
Brassica napus  
Oryza sativa Japonica  
Zea mays parviglumis  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

TTCGGATTGTTACAACCTCTAGCAGATGGTTU  
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TTCGGATTGTTACAACCTCTAGCAGATGGTTU  
AAAATTGATTCTAAAAGA  
TTCGGATTGTTACAACCTCTAGCAGATGGTTT  
GAAATTGATTCTAAAAGA  
TTCGGATTGTTACAACCTCTAGCAGATGGTTT  
GAAATTGATTCTAAAAGA  
TTCGGATTGTTACAACCTCTAGCAGATGGTTU  
GAAATTGATTCTAAAAGA  
TTCGGATTGTTACAACCTCTAGCAGATGGTTT  
GAAATTGATTCTAAAAGA  
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AAAATTGGTTCGAAAAGA  
TTCGGATCGTTACAACCCTTAGCAGATGGTTT  
GAAATTAATGATAAAAAGA  
TTCGGATCGTTACAACCCTTAGCAGATGGTTT  
GAAATTAATGATAAAAAGA  
TTTTGGTTGTTACAACCTCTAGCAGATGGTTT  
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BPM24\_nad1  
RRIC110\_nad1  
RRII105\_nad1  
PB235\_nad1  
RRIT251\_nad1  
RRIM600\_nad1  
Arabidopsis thaliana  
Citrullus lanatus  
Cucurbita pepo  
Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
Millettia pinnata  
Vigna radiata  
Lotus japonicus  
Brassica napus  
Oryza sativa Japonica  
Zea mays parviglumis  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

ACCTATTTACCAAGTAGTGCTAATTTCTU  
CCTTTTTAGAATGGCTCCAG  
ACCTATTTACCAAGTAGTGCTAATTTCTU  
CCTTTTTAGAATGGCTCCAG  
ACCTATTTACCAAGTAGTGCTAATTTCTU  
CCTTTTTAGAATGGCTCCAG  
ACCTATTTACCAAGTAGTGCTAATTTCTU  
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CCTTTTTAGAATGGCTCCAG  
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CCTTTTTAGAATGGCTCCAG  
ACCTCTTTACCAAGTAGTGCAAATTTU  
TU CCTTTTTAGAATGGCTCCAG  
ACCTCTTTACCAAGTAGTGCTAATTTCTU  
CCTTTTTAGAATGGCTCCAG  
ACCTATTTACCAAGTAGTGCTAATTTCTU  
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ACCTATTTACCAAGTAGTGCTAATTTCTU  
CCTTTTTAGAATGGCTCCAG  
ACCTATTTACCAAGTAGTGCTAATTTCTU  
CCTTTTTAGAATGGCTCCAG  
ACCTATTTACCAAGTAGTGCTAATTTCTC  
CCTTTTTAGAATGGCTCCAG  
ACCTATTTACCAAGTAGTGCTAATTTTT  
CCTTTTTAGAATGGCTCCAG  
ACCTATTTACCAAGTAGTGCTAATTTCTC  
CCTTTTTAGAATGGCTCCAG  
ACCTATTTACCAAGTAGTGCTAATTTAT  
TTCTTTCCAGAAATGGCTCCAG  
ACCTATTTACCAAGTAGTGCTAATTTAT  
TTCTTTTATAATGGCTCCAG  
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TTCTTTTATAATGGCTCCAG  
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TCAATTTTTCAATGGCTCCAG  
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BPM24\_nad1  
RRIC110\_nad1  
RRII105\_nad1  
PB235\_nad1  
RRIT251\_nad1  
RRIM600\_nad1  
Arabidopsis thaliana  
Citrullus lanatus  
Cucurbita pepo  
Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
Millettia pinnata  
Vigna radiata  
Lotus japonicus  
Brassica napus  
Oryza sativa Japonica  
Zea mays parviglumis  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

TGGCTACATTTATGTTAAGTCTGGTCGCTU  
GGGCCGTTGTACCTTTTGAT  
TGGCTACATTTATGTTAAGTCTGGTCGCTU  
GGGCCGTTGTACCTTTTGAT  
TGGCTACATTTATGTTAAGTCTGGTCGCTU  
GGGCCGTTGTACCTTTTGAT  
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GGGCCGTTGTACCTTTTGAT  
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GGGCCGTTGTACCTTTTGAT  
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GGGCCGTTGTACCTTTTGAT  
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GGGCCGTTGTACCTTTTGAT  
\* \* \* \* \* \*\*\*\*\* \* \* \* \* \* \*\* \* \* \* \* \*

BPM24\_nad1  
RRIC110\_nad1  
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PB235\_nad1  
RRIT251\_nad1  
RRIM600\_nad1  
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Cucurbita pepo  
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Beta vulgaris vulgaris  
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Millettia pinnata  
Vigna radiata  
Lotus japonicus  
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Oryza sativa Japonica  
Zea mays parviglumis  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

TATGGTATGGTATTGTCAGATCCGAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATCCGAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATCCGAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATCCGAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATCCGAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATCCGAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATUU GAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATCU GAACATAGGGCTACTTTATTTGTTTGC  
TATGGGATGGTATTGTCAGATCU GAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATUU GAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATUU GAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATTU GAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATTU GAACATAGGGCTACTTTATTTGTTTGC  
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TATGGTATGGTATTGTCAGATUU GAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATUU GAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATUU GAACATAGGGCTACTTTATTTGTTTGC  
TATGGTATGGTATTGTCAGATTCAAATGTAGGTATACTTCATCTATTTCGC  
TATGGTATGGTATTGTCAGATTCAAATGTAGGTATACTTCATCTATTTCGC  
TATGGTATGGTATTGTCAGATTCAAATGTAGGTATACTTTATTTATTTTGC  
\*\*\*\*\* \*\*\*\*\* \* \*\*\*\*\* \* \*\*\*\*\* \*\*\*\*\* \*\* \* \*\* \*\*

BPM24\_nad1  
RRIC110\_nad1  
RRII105\_nad1  
PB235\_nad1  
RRIT251\_nad1  
RRIM600\_nad1  
Arabidopsis thaliana  
Citrullus lanatus  
Cucurbita pepo  
Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
Millettia pinnata  
Vigna radiata  
Lotus japonicus  
Brassica napus  
Oryza sativa Japonica  
Zea mays parviglumis  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

CATATCTTCGCTAGGTGTTTATGGAATTATTATAGCAGGTCGGTCTAGTA  
CATATCTTCGCTAGGTGTTTATGGAATTATTATAGCAGGTCGGTCTAGTA  
CATATCTTCGCTAGGTGTTTATGGAATTATTATAGCAGGTCGGTCTAGTA  
CATATCTTCGCTAGGTGTTTATGGAATTATTATAGCAGGTCGGTCTAGTA  
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\*\* \*\* \* \*\*\*\*\* \*\* \*\* \* \*\* \* \*\* \*\*

BPM24\_nad1  
RRIC110\_nad1  
RRII105\_nad1  
PB235\_nad1  
RRIT251\_nad1  
RRIM600\_nad1  
Arabidopsis thaliana  
Citrullus lanatus  
Cucurbita pepo  
Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
Millettia pinnata  
Vigna radiata

AT - TCGAAATATGCCTTTCTAGGAGCATTACGATCTGCAGCTCAAATGGT  
AT - TCGAAATATGCCTTTCTAGGAGCATTACGATCTGCAGCTCAAATGGT  
AT - TCGAAATATGCCTTTCTAGGAGCATTACGATCTGCAGCTCAAATGGT  
AT - TCGAAATATGCCTTTCTAGGAGCATTACGATCTGCAGCTCAAATGGT  
AT - TCGAAATATGCCTTTCTAGGAGCATTACGATCTGCAGCTCAAATGGT  
AT - TCGAAATATGCCTTTCTAGGAGCATTACGATCTGCAGCTCAAATGGT  
AT - TCGAAATATGCCTTTCTAGGAGCATTACGATCTGCAGCTCAAATGGT  
AT - - TAGGGGGCGCCGTTTCGGTCGC - CTATGATACTAGGACCAATAGGT  
AT - - TAGGGGGCGCCGTTTCGGTCGC - CTATGATACTAGGACCAATAGGT  
ATTATAGGGGGCGCCGTTTCGGTCGC - CTATGATACTAGGACCAATAGGT  
ATTATAGGGGGCGCCGTTTCGGTCGC - CTATGATACTAGGACCAATAGGT  
ATTTTAGGGGGCGCCGTTTCGGTCGC - CTATGATACTAGGACCAATAGGT  
AT - - TAGGGGGCGCCGTTTCGGTCGC - CTATGATACTAGGACCAATAGGT  
AT - - TAGGGGGCGCCGTTTCGGTCGC - CTATGATACTAGGACCAATAGGT

Lotus japonicus  
 Brassica napus  
 Oryza sativa Japonica  
 Zea mays parviglumis  
 Cycas taitungensis  
 Megaceros aenigmaticus  
 Phaeoceros laevis  
 Huperzia squarrosa

AT - - TAGGGGGCGGCCGTTTCGGTTCGC - CTATGATACTAGGACCAATAGGT  
 AT - - TAGGGGGCGGCCGTTTCGGTTCGC - CTATGAGACTAGGACCAATAGGT  
 AG - ACGGGGGGCGGCCGTTTCGGTTCGC - CTATGATATACGGACCAATTGGT  
 AG - ACGGGGGGCGGCCGTTTCGGTTCGC - CTATGATATACGGACCAATTGGT  
 AT - TAGGGGGGCGGCCGTTTCGGTTCGC - CTATGATACTAAGGCCAATGGGT  
 AT - CCAAATATGCGTCTTCAGGAGCATCACGATCTGCAGCTCAAACGGT  
 AT - CTAATATGTTCTTCAGGAGCATCACGATTTGCAGTTCAAACGGT  
 AT - TCTAAATATGCTTTTTCAGGAGCATTACGATCTGCAGCTCAAATGGT

BPM24\_nad1  
 RRIC110\_nad1  
 RRII105\_nad1  
 PB235\_nad1  
 RRIT251\_nad1  
 RRIM600\_nad1  
 Arabidopsis thaliana  
 Citrullus lanatus  
 Cucurbita pepo  
 Beta macrocarpa  
 Beta vulgaris vulgaris  
 Silene latifolia  
 Millettia pinnata  
 Vigna radiata  
 Lotus japonicus  
 Brassica napus  
 Oryza sativa Japonica  
 Zea mays parviglumis  
 Cycas taitungensis  
 Megaceros aenigmaticus  
 Phaeoceros laevis  
 Huperzia squarrosa

CTCTTATGAAGTCTCTATTGGTCTTATTCTTATTACTGTACTAATATGTG  
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 CTCTTATGAAGTCTCTATTGGTCTTATTCTTATTACTGTACTAATATGTG  
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 CAAAAATGGGTT-----  
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 AAAAAATAGCT-----  
 AAAAAATGGCT-----  
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 CAAAAATTTG-----  
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 TCTTTATGAAGTTTCTATTGGTCCCATTATTACTGTATTAATCTGTG  
 TTCTTATGAAGTCTCTATTGGTCTTATTATTACTGTACTAATCCGTG

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BPM24\_nad1  
 RRIC110\_nad1  
 RRII105\_nad1  
 PB235\_nad1  
 RRIT251\_nad1  
 RRIM600\_nad1  
 Arabidopsis thaliana  
 Citrullus lanatus  
 Cucurbita pepo  
 Beta macrocarpa  
 Beta vulgaris vulgaris  
 Silene latifolia  
 Millettia pinnata  
 Vigna radiata  
 Lotus japonicus  
 Brassica napus  
 Oryza sativa Japonica  
 Zea mays parviglumis  
 Cycas taitungensis  
 Megaceros aenigmaticus  
 Phaeoceros laevis  
 Huperzia squarrosa

TAGGTCCTCGTAATTCGAGTGAGATTGTCATGGCGCAAAGCAGATATGG  
 TAGGTCCTCGTAATTCGAGTGAGATTGTCATGGCGCAAAGCAGATATGG  
 TAGGTCCTCGTAATTCGAGTGAGATTGTCATGGCGCAAAGCAGATATGG  
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 TAGGTCCTCGTAATTCGAGTGAGATTGTCATGGCGCAAAGCAGATATGG  
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 TAGGTCCTCGTAATTCGAGTGAGATTGTCATGGCGCAAAGCAGATATGG

BPM24\_nad1  
 RRIC110\_nad1  
 RRII105\_nad1  
 PB235\_nad1

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 TCTGGTATTCCCTTGTTCCCTGTATTGGTTATGTTCTUATTTCTTGTCT  
 TCTGGTATTCCCTTGTTCCCTGTATTGGTTATGTTCTCATTTCCTTGTCT  
 TCTGGTATTCCCTTGTTCCCTGTATTGGTTATGTTCTUATTTCTTGTCT

RRIT251_nad1	TCTGGTATTCCTTGTTCCCTGTATTGGTTATGTTCCCTNATTTCTTGTCT
RRIM600_nad1	TCTGGTATTCCTTGTTCCCTGTATTGGTTATGTTCCCTNATTTCTTGTCT
Arabidopsis thaliana	UTGGTATTCCTGTTCCCTGTATTGGTTATGTTCTTATTCTUGTCT
Citrullus lanatus	-----
Cucurbita pepo	-----
Beta macrocarpa	-----
Beta vulgaris vulgaris	-----
Silene latifolia	-----
Millettia pinnata	-----
Vigna radiata	-----
Lotus japonicus	-----
Brassica napus	-----
Oryza sativa Japonica	-----
Zea mays parviglumis	-----
Cycas taitungensis	-----
Megaceros aenigmaticus	TTCGGCATTCCCTTGTTCCCTGTATTGATTATGTTTTTCATTTCTCGTCT
Phaeoceros laevis	TTCGGCATTCCCTTGTTCCAGTATTGATTATGTTTTTCATTTCTTGTCT
Huperzia squarrosa	TTTGGCATTCCCTTGTTCCCTGTATTGATTATGTTTTTATTTCTCGTCT

BPM24_nad1	AGCAGAACTAATCGAGCTCCGTTTGATCTCCAGAAAGCGGAAGCTGAAT
RRIC110_nad1	AGCAGAACTAATCGAGCTCCGTTTGATCTCCAGAAAGCGGAAGCTGAAT
RRII105_nad1	AGCAGAACTAATCGAGCTCCGTTTGATCTCCAGAAAGCGGAAGCTGAAT
PB235_nad1	AGCAGAACTAATCGAGCTCCGTTTGATCTCCAGAAAGCGGAAGCTGAAT
RRIT251_nad1	AGCAGAACTAATCGAGCTCCGTTTGATCTCCAGAAAGCGGAAGCTGAAT
RRIM600_nad1	AGCAGAACTAATCGAGCTCCGTTTGATCTCCAGAAAGCGGAAGCTGAAT
Arabidopsis thaliana	AGCAGAACTAATCGAGCTCCGTTTGATCTCCAGAAAGCGGAAGCTGAAT
Citrullus lanatus	-----
Cucurbita pepo	-----
Beta macrocarpa	-----
Beta vulgaris vulgaris	-----
Silene latifolia	-----
Millettia pinnata	-----
Vigna radiata	-----
Lotus japonicus	-----
Brassica napus	-----
Oryza sativa Japonica	-----
Zea mays parviglumis	-----
Cycas taitungensis	-----
Megaceros aenigmaticus	AGCAGAACTAATAGGGCTTTTTCTGATCCACCAGAAGCAGAAGCGGAAT
Phaeoceros laevis	AGCAGAAATTAATAGGGCTTTTTTTGATCCACTAGAAGTAGAAGCGGAAT
Huperzia squarrosa	AGCAGAACTAATCGGGCCCCGTTTGATCTACCAGAAGCAGAAGCTGAAT

BPM24_nad1	UAGTTGCAGGCTATAATGTAGAATATTCTTCAATGGGGTCTGCTCTTTTT
RRIC110_nad1	UAGTTGCAGGCTATAATGTAGAATATTCTTCAATGGGGTCTGCTCTTTTT
RRII105_nad1	CAGTTGCAGGCTATAATGTAGAATATTCTTCAATGGGGTCTGCTCTTTTT
PB235_nad1	CAGTTGCAGGCTATAATGTAGAATATTCTTCAATGGGGTCTGCTCTTTTT
RRIT251_nad1	NAGTTGCAGGCTATAATGTAGAATATTCTTCAATGGGGTCTGCTCTTTTT
RRIM600_nad1	NAGTTGCAGGCTATAATGTAGAATATTCTTCAATGGGGTCTGCTCTTTTT
Arabidopsis thaliana	UAGTTGCAGGCTATAATGTAGAATATTCTTCAATGGGGTCTGCTCTTTTT
Citrullus lanatus	-----
Cucurbita pepo	-----
Beta macrocarpa	-----
Beta vulgaris vulgaris	-----
Silene latifolia	-----
Millettia pinnata	-----
Vigna radiata	-----
Lotus japonicus	-----
Brassica napus	-----
Oryza sativa Japonica	-----
Zea mays parviglumis	-----



Cucurbita pepo -----  
Beta macrocarpa -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
Millettia pinnata -----  
Vigna radiata -----  
Lotus japonicus -----  
Brassica napus -----  
Oryza sativa Japonica -----  
Zea mays parviglumis -----  
Cycas taitungensis -----  
Megaceros aenigmaticus CGATTTCCGGGCTCTATTTGGTTTCAGTATCAAGGTTCTTTTCTTTCCGCC  
Phaeoceros laevis GGATTTCCGGGCTCTATTTGGTTTCAGTATCAAGGTTCTTTTCTTTCTGTT  
Huperzia squarrosa TGATTTCCGGGCTCGATCTGGTTTCAGTATCAAGGTTCTTCTTTCTGTT

BPM24\_nad1 CTATATATATGGGTCCGTGCAGCATTTCACGATATCGTTATGATCAATT  
RRIC110\_nad1 CTATATATATGGGTCCGTGCAGCATTTCACGATATCGTTATGATCAATT  
RRII105\_nad1 CTATATATATGGGTCCGTGCAGCATTTCACGATATCGTTATGATCAATT  
PB235\_nad1 CTATATATATGGGTCCGTGCAGCATTTCACGATATCGTTATGATCAATT  
RRIT251\_nad1 CTATATATATGGGTCCGTGCAGCATTTCACGATATCGTTATGATCAATT  
RRIM600\_nad1 CTATATATATGGGTCCGTGCAGCATTTCACGATATCGTTATGATCAATT  
Arabidopsis thaliana CTATATATATGGGTCCGTGCAGCATTTCACGATATCGTTATGATCAATT  
Citrullus lanatus -----  
Cucurbita pepo -----  
Beta macrocarpa -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
Millettia pinnata -----  
Vigna radiata -----  
Lotus japonicus -----  
Brassica napus -----  
Oryza sativa Japonica -----  
Zea mays parviglumis -----  
Cycas taitungensis -----  
Megaceros aenigmaticus ATACATATACGGGTCCGTGCAGCATTTCACGATATCGTTATGATCAATC  
Phaeoceros laevis ATACATATACGGGTCTGTGCAGCATTTCACGATATCGTTATGATCAATC  
Huperzia squarrosa GTATATATATGGGTCCGTGCAGCATTTCACGATATCGTTATGATCAATT

BPM24\_nad1 AATGGGACTTGGCUGGAAAGTGTTCTTGCCTCTATCATTAGCTUGGGTAG  
RRIC110\_nad1 AATGGGACTTGGCUGGAAAGTGTTCTTGCCTCTATCATTAGCTUGGGTAG  
RRII105\_nad1 AATGGGACTTGGCUGGAAAGTGTTCTTGCCTCTATCATTAGCTUGGGTAG  
PB235\_nad1 AATGGGACTTGGCUGGAAAGTGTTCTTGCCTCTATCATTAGCTUGGGTAG  
RRIT251\_nad1 AATGGGACTTGGCUGGAAAGTGTTCTTGCCTCTATCATTAGCTUGGGTAG  
RRIM600\_nad1 AATGGGACTTGGCNGGAAAGTGTTCTTGCCTCTATCATTAGCTNNGGGTAG  
Arabidopsis thaliana AATGGGACTTGGCUGGAAAGTGTTCTTGCCTCTATCATTAGCTUGGGTAG  
Citrullus lanatus -----  
Cucurbita pepo -----  
Beta macrocarpa -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
Millettia pinnata -----  
Vigna radiata -----  
Lotus japonicus -----  
Brassica napus -----  
Oryza sativa Japonica -----  
Zea mays parviglumis -----  
Cycas taitungensis -----  
Megaceros aenigmaticus AATGAGACTTGGCTGGAAAGTATTCTTGCCTTTATCATTAGCACGGGTAG  
Phaeoceros laevis AATGAGACTTGGCTGGAAAGTATTCTTGCCTTTATCATTAGCATGGGTAG  
Huperzia squarrosa AATGAGACTTGGCTGGAAAGTATTTTTGCCTTTATCATTAGCATGGGTAG

BPM24_nad1	TCUCCGTTTCTGGTGTTTTAGTCACCTTTCAATGGCTCCCTTAA
RRIC110_nad1	TCUCCGTTTCTGGTGTTTTAGTCACCTTTCAATGGCTCCCTTAA
RRII105_nad1	TCUCCGTTTCTGGTGTTTTAGTCACCTTTCAATGGCTCCCTTAA
PB235_nad1	TCUCCGTTTCTGGTGTTTTAGTCACCTTTCAATGGCTCCCTTAA
RRIT251_nad1	TCUCCGTTTCTGGTGTTTTAGTCACCTTTCAATGGCTCCCTTAA
RRIM600_nad1	TCCCCGTTTCTGGTGTTTTAGTCACCTTTCAATGGCTCCCTTAA
Arabidopsis thaliana	TCUCTGTTTCTGGTCTTTTAGTCACCTTTCAATGGCTTCCTTAA
Citrullus lanatus	-----
Cucurbita pepo	-----
Beta macrocarpa	-----
Beta vulgaris vulgaris	-----
Silene latifolia	-----
Millettia pinnata	-----
Vigna radiata	-----
Lotus japonicus	-----
Brassica napus	-----
Oryza sativa Japonica	-----
Zea mays parviglumis	-----
Cycas taitungensis	-----
Megaceros aenigmaticus	TCTTTGTATCTGGTATTCCAGTAGCCTTTGACTGGCTCCCCTAA
Phaeoceros laevis	TCTTTGTATCTGGTATTCCAGTAGCCTTTGACTGGCTCCCGUAA
Huperzia squarrosa	TCTTTGTATCTGGTGTTCTAATAACCTTTGACTGGCTTCCTUGA

#####

**nad2 multiple sequence alignment**

Arabidopsis thaliana	ATGAAAGCAGAATTCGTTTCGGATCCTCCCACACATGTTCAATCTT --- TT
Brassica napus	-----ATGTTCAATCTT --- TT
Lotus japonicus	-----ATGTTCAATCTT --- TT
Citrullus lanatus	-----ATGTTCAATCTT --- TT
Cucurbita pepo	-----ATGTTCAATCTT --- TT
Beta vulgaris maritima	-----ATGTTCAATCTT --- TT
Beta vulgaris vulgaris	-----ATGTTCAATCTT --- TT
Silene latifolia	-----ATGTTCAATCTT --- TT
BPM24_nad2	-----ATGTTCAATCTT --- TT
RRII105_nad2	-----ATGTTCAATCTT --- TT
RRIC110_nad2	-----ATGTTCAATCTT --- TT
PB235_nad2	-----ATGTTCAATCTT --- TT
RRIT251_nad2	-----ATGTTCAATCTT --- TT
RRIM600_nad2	-----ATGTTCAATCTT --- TT
Megaceros aenigmaticus	-----ATGTTTGACCATGATTT
Phaeoceros laevis	-----ATGTTTGACCATGATTT

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Arabidopsis thaliana	TTTAGCGGTTT UCCAGAGATCTTTATCATTAAATGCAACCTUU ATTTTGC
Brassica napus	TTTAGCGGTTT UCCAGAGATCTTTATCATTAAATGCAACCTUU ATTTTGC
Lotus japonicus	TTTAGCGGTTT UCCAGAGATCTTTCTCATTAAATGCAACCTU CATTTTGC
Citrullus lanatus	TTTAGCGGTTT CCCCAGAGATCTTTATCATTAAATGCAACTTT CATTTTGC
Cucurbita pepo	TTTAGCGGTTT UCCAGAGATCTTTATCATTAAATGCAACTTT CATTTTGC
Beta vulgaris maritima	TTTAGCGGTTT UCCAGAGATCTTTCTCATTAAATGCAACCTTC ATTTTGC
Beta vulgaris vulgaris	TTTAGCGGTTT UCCAGAGATCTTTCTCATTAAATGCAACCTTC ATTTTGC
Silene latifolia	TTTAGCGGTTT UCCAGAGATCTTTATCATTAAATGCAACCTTC ATTTTGC
BPM24_nad2	TTTAGCGGTTT UCCAGAGATCTTTATCATTAAATGCAACCTU CATTTTGC
RRII105_nad2	TTTAGCGGTTT UCCAGAGATCTTTATCATTAAATGCAACCTU CATTTTGC
RRIC110_nad2	TTTAGCGGTTT UCCAGAGATCTTTATCATTAAATGCAACCTU CATTTTGC
PB235_nad2	TTTAGCGGTTT UCCAGAGATCTTTATCATTAAATGCAACCTCC ATTTTGC
RRIT251_nad2	TTTAGCGGTTT NCCCAGAGATCTTTATCATTAAATGCAACCTNC ATTTTGC
RRIM600_nad2	TTTAGCGGTTT NCCCAGAGATCTTTATCATTAAATGCAACCTNC ATTTTGC
Megaceros aenigmaticus	CTTAGCACTTTT CCCCAGAGATCTTTCTTATTAACGCAACTATCACTTTGC
Phaeoceros laevis	CTTAGCACTTTT CCTAGAGATCTTTCTTATTAACGCAACTATAACTTCGC

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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_nad2  
RRII105\_nad2  
RRIC110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

TCATTCATGGAGTTGTATTTAGTACCTCTAAGAAATATGATTATCCGCCG  
TCATTCATGGAGTTGTATTTAGTACCTCTAAGAAATATGATTATCCGCCG  
TCATTCATGGGGTTGTATTTAGTACCTCTAAGAAATATGATTATCCACCG  
TCATTCATGGAGTTGTATTTAGTACCTCTAAGAAATATGATTATCCACCG  
TCATTCATGGAGTTGTATTTAGTACCTCTAAGAAATATGATTATCCACCG  
TCATTCATGGAGTTATTTTTAGTACCTCTAAGAAATATGATTATCCACCG  
TCATTCATGGAGTTGTTTTAGTACCTCTAAGAAATATGATTATCCACCG  
TCATTUATGGAGTTGTATTTAGTACCTCTAAGAAATATGATTATCCGCCG  
TCATTUATGGAGTTGTATTTAGTACCTCTAAGAAATATGATTATCCGCCG  
TCATTUATGGAGTTGTATTTAGTACCTCTAAGAAATATGATTATCCGCCG  
TCATTUATGGAGTTGTATTTAGTACCTCTAAGAAATATGATTATCCGCCG  
TCATTNATGGAGTTGTATTTAGTACCTCTAAGAAATATGATTATCCGCCG  
TTATTTATGGAGTTGTATTGAGTACCTCCGAAAGATATGATTATCCACCG  
CTATTTATGGAGTTGTATTTAGTACCTCCAAAAGATATGATTATCCACCG

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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_nad2  
RRII105\_nad2  
RRIC110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

TTAGCCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGCCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTCAGTAATGTGGGTTGGCTTGGATTACTTAGTGTTCTAATAACCTT  
TTAGTTTGAATGTGGGTTGGCTTGGTTTACCTAGTGTTCTAATAACCAT  
TTAGTTTGAATGTGGGTTGGCTTGGTTTACCTAGTGTTCTAATAACCAT

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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_nad2  
RRII105\_nad2  
RRIC110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

GCTTCTGCTCGCCGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTCTGCTCGCCGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTCTGCTCGCCGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCC  
GCTTCTGCTCGCCGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTTTGTCTCGCTGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTTTGTCTCGCTGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTTTGTCTCGCTGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTTTGTCTCGCTGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTCTGCTCGCCGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTCTGCTCGCCGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTCTGCTCGCCGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTCTGCTCGCCGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTCTGCTCGCCGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTCTGCTCGCCGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
GCTTCTGCTCGCCGCTGGCGCACCTCTCCTAACTATTGCCATTTATTCT  
CTTATTGGTTGCCGCTGGCGCACTG-----GTTGCCAATTTATTCT  
CTTATTGGTTGCCGCTGGCGCACTG-----GTTGCCAATTTATTCT

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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima

GGAATAATCTTTTTAGGAGGGACAATTTTACATATTTCTGCCAAATCTTT  
GGAATAATCTTTTTAGGAGGGACAATTTTACATATTTCTGCCAAATCTTT  
GGAATAATCTTTTTAGGAGGGACAATTTTACATATTTCTGCCAAATCTTT  
GGAATAATCTTTTTAGGAGGGACAATTTGACATATTTCTGCCAAATCTTT  
GGAATAATCTTTTTAAGAGGGACAATTTTACATATTTCTGCCAAATCTTT





Megaceros aenigmaticus  
Phaeoceros laevis

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TCCGCAGTATGCCTCTTACGATTTTGGCTTACGATTCAATTGCGATGTAT  
TTTGCAGTATGTTTTTTATGATTTTGGCTTACGATTTAATTGCGACGTAT  
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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_nad2  
RRII105\_nad2  
RRI110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

```
TTAGCTATTGAGCUTCAAAGTTTATGTTTTATGTAATCGCAGCATCAAA  
TTAGCTATTGAGCUTCAAAGTTTATGTTTTATGTAATCGCAGCATCAAA  
TTAGCTATTGAGCUTCAAAGTTTATGTTTTATGTGATGGCAGCATCAAA  
TTAGCTATTGAGCUTCAAAGTTTATGTTTTATGTGATGGCAGCATCAAA  
TTAGCTATTGAGCUTCAAAGTTTATGTTTTATGTGATGGCAGCATCCAA  
TTAGCTATTGAGCUTCAAAGTTTATGTTTTATGTGATCGCAGCATCAAA  
TTAGCTATTGAGCUTCAAAGTTTATGTTTTATGTGATCGCAGCATCAAA  
TTAGCTATTGAGCUTCAAAGTTTATGTTTTATGTGATCGCAGCATCAAA  
TTAGCTATTGAGCCTCAAAGTTTATGTTTTATGTGATCGCAGCATCAAA  
TTAGCTATTGAGCCTCAAAGTTTATGTTTTATGTGATCGCAGCATCAAA  
TTAGCTATTGAGCCTCAAAGTTTATGTTTTATGTGATCGCAGCATCAAA  
TTAGCTATTGAGCCTCAAAGTTTATGTTTTATGTGATCGCAGCATCAAA  
TTAGCTATTGAGCCTCAAAGTTTATGTTTTATGTGATCGCAGCATCAAA  
TCAAGTATTGAGCCTCAAAGTTTATGTTTCTATGTGATCGCAGCATCCAA  
TCAAGTATTGAGCCTCAAAGTTTATGTTTCTATGTGATTGCAGCATCTAA  
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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_nad2  
RRII105\_nad2  
RRI110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

```
AAGAAAGTCTGAATTTTCCACGGAAGCCGGUTUGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCCACGGAAGCCGGCTUGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCCACGGAAGCCGGCTUGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCCACGGAAGCCGGCTUGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCTACGGAAGCCGGCTCGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCTACGGAAGCCGGCTUGAAATATTTGATCTTAG  
ACGAAAGTCTGAATTTTCTACGGAAGCCGGCTUGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCCACGGAAGCCGGCTCGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCCACGGAAGCCGGCTCGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCCACGGAAGCCGGCTCGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCCACGGAAGCCGGCTCGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCCACGGAAGCCGGCTCGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCCACGGAAGCCGGCTCGAAATATTTGATCTTAG  
AAGAAAGTCTGAATTTTCCACGGAAGCCGGCTCGAAATATTTGATCTTAG  
AAGAGACTCTGAATTTTCCACAGAAGCCGGCTTAAAATATTTTATTTTATAG  
AAGAGACTCTGAATTTTCCACAGAAGCCGGCTTAAAATATTTTATTTTATAG  
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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_nad2  
RRII105\_nad2  
RRI110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

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GTGCATTTTCTGGAATATTATTGTTTGG-----  
GTGCATTTTCTGGAATATTATTGTTTGG-----  
GTGCATTTTCTGGAATATTACTGTTTGG-----  
GTGCATTTTCTGGAATATTACTGTTTGG-----  
GTGCATTTTCTGGAATATTACTGTTTGG-----  
GTGCATTTTCTGGAATATTATTGTTTGG-----  
GTGCATTTTCTGGAATATTATTGTTTGG-----  
GTGCATTTTCTGGAATATTATTGTTTGG-----  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
GTGCATTTTCTGGAATATTATTGTTTGGTTGTTCCATGATCTATGGG  
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Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus

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Cucurbita pepo -----  
Beta vulgaris maritima -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
BPM24\_nad2 TCTACAGGAGCTACCCACTTCGATCAATTAGCCAAGATTTTGACCGGATA  
RRII105\_nad2 TCTACAGGAGCTACCCACTTCGATCAATTAGCCAAGATTTTGACCGGATA  
RRIC110\_nad2 TCTACAGGAGCTACCCACTTCGATCAATTAGCCAAGATTTTGACUGGATA  
PB235\_nad2 TCTACAGGAGCTACCCACTTCGATCAATTAGCCAAGATTTTGACUGGATA  
RRIT251\_nad2 TCTACAGGAGCTACCCACTTCGATCAATTAGCCAAGATTTTGACCGGATA  
RRIM600\_nad2 TCTACAGGAGCTACCCACTTCGATCAATTAGCCAAGATTTTGACNNGGATA  
Megaceros aenigmaticus TTTACTGGAGTTACCAACTTTGAGGAATTAGCCAAGATCTTTACTGGATA  
Phaeoceros laevis TTTACTGGAGTTACCAACTTTGAGGAATTAGCCAAGATCTTTACTGGATA

Arabidopsis thaliana -----  
Brassica napus -----  
Lotus japonicus -----  
Citrullus lanatus -----  
Cucurbita pepo -----  
Beta vulgaris maritima -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
BPM24\_nad2 CGAAATCACT-----GGTGCTCGATCTAGTGGTATTTTTATGGGGATTC  
RRII105\_nad2 CGAAATCACT-----GGTGCTCGATCTAGTGGTATTTTTATGGGGATTC  
RRIC110\_nad2 CGAAATCACT-----GGTGCTCGATCTAGTGGTATTTTTATGGGGATTC  
PB235\_nad2 CGAAATCACT-----GGTGCTCGATCTAGTGGTATTTTTATGGGGATTC  
RRIT251\_nad2 CGAAATCACT-----GGTGCTCGATCTAGTGGTATTTTTATGGGGATTC  
RRIM600\_nad2 CGAAATCACT-----GGTGCTCGATCTAGTGGTATTTTTATGGGGATTC  
Megaceros aenigmaticus TGAAATCACTTTATTCGGTGTCTAATCTAGTGGGATCTTTATGGGGATTC  
Phaeoceros laevis TGAAATCACTTTGTTTCGGTGTCTAATCTAGTGGGATCTTTATGGGGATTC

Arabidopsis thaliana -----  
Brassica napus -----  
Lotus japonicus -----  
Citrullus lanatus -----  
Cucurbita pepo -----  
Beta vulgaris maritima -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
BPM24\_nad2 TATCTATCGCTGTAGGATTCCTATTCAAGATCACTGCAGTTCCTTTTCAT  
RRII105\_nad2 TATCTATCGCTGTAGGATTCCTATTCAAGATCACTGCAGTTCCTTTTCAT  
RRIC110\_nad2 TATCTATCGCTGTAGGATTCCTATTCAAGATCACTGCAGTTCCTTTTCAT  
PB235\_nad2 TATCTATCGCTGTAGGATTCCTATTCAAGATCACTGCAGTTCCTTTTCAT  
RRIT251\_nad2 TATCTATCGCTGTAGGATTCCTATTCAAGATCACTGCAGTTCCTTTTCAT  
RRIM600\_nad2 TATNTATCGCTGTAGGATTCCTATTCAAGATCACTGCAGTTCCTTTTCAT  
Megaceros aenigmaticus TATTTATCGCCGTAGGTTTTTTTATTTAAAATAACTGCAGTTCCTTTTCAT  
Phaeoceros laevis CATTTATCGCCGTAGGTTTTTTTATTTAAAATAACTGCAGTTCCTTTTCAT

Arabidopsis thaliana -----  
Brassica napus -----  
Lotus japonicus -----  
Citrullus lanatus -----  
Cucurbita pepo -----  
Beta vulgaris maritima -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
BPM24\_nad2 ATGTGGGCACCTGATATCTATGAGGGTTCACCCACCCCGTTACAGCATT  
RRII105\_nad2 ATGTGGGCACCTGATATCTATGAGGGTTCACCCACCCCGTTACAGCATT  
RRIC110\_nad2 ATGTGGGCACCTGATATCTATGAGGGTTCACCCACCCCGTTACAGCATT  
PB235\_nad2 ATGTGGGCACCTGATATCTATGAGGGTTCACCCACCCCGTTACAGCATT

RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

ATGTGGGCACCTGATATCTATGAGGGTTCACCCACCCCGTTACAGCATT  
ATGTGGGCACCTGATATCTATGAGGGTTCACCCACCCCGTTACAGCATT  
ATGTGGGCGCCTGATGTATACGAGGGTTCACCTACCCTGGTTACAGCATT  
ATGTGGGCGCCTGATGTATACGAGGGTTCACCTACCCTGGTTACAGCATT

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia

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BPM24\_nad2  
RRII105\_nad2  
RRIC110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

CCTTTCTATTGCGCCTAAAATCTCTATTTTTGCTAATATTTUACGTGTTT  
CCTTTCTATTGCGCCTAAAATCTCTATTTTTGCTAATATTTUACGTGTTT  
CCTTTCTATTGCGCCTAAAATCTCTATTTTTGCTAATATTTUACGTGTTT  
CCTTTCTATTGCGCCTAAAATCTCTATTTTTGCTAATATTTUACGTGTTT  
CCTTTCTATTGCGCCTAAAATCTCTATTTTTGCTAATATTTUACGTGTTT  
CCTTTCTATTGCGCCTAAAATCTCTATTTTTGCTAATATTTNACGTGTTT  
TTTCCCCATTGCACCTAAAATATCTATTCTTGCCAATATGTTACGTGTCT  
TTTTTCCATTGCACCTAAAATCTCTATTCTTGCCAATATGTTACGTGTCT

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia

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BPM24\_nad2  
RRII105\_nad2  
RRIC110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

UTATTTATGGTTCCTATGGAGCTACATTGCAACAAATCTTCTTTTTCTGC  
UTATTTATGGTTCCTATGGAGCTACATTGCAACAAATCTTCTTTTTCTGC  
UTATTTATGGTTCCTATGGAGCTACATTGCAACAAATCTTCTTTTTCTGC  
UTATTTATGGTTCCTATGGAGCTACATTGCAACAAATCTTCTTTTTCTGC  
UTATTTATGGTTCCTATGGAGCTACATTGCAACAAATCTTCTTTTTCTGC  
NTATTTATAGTTTCTATGATCCGACATGGCAACAACTATTCTTTTTCTGC  
TTATTTATAGTTTCTATGATCCGACATGGCAACAACTATTCTTTTTCTGC  
TTATTTATAGTTTCTATGATCCGACATGGCAACAACTATTCTTTCTCTGC

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia

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BPM24\_nad2  
RRII105\_nad2  
RRIC110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

AGCATTGCTTCTATGATCTTAGGAGCACTGGCCGCCATGGCCCAAACGAA  
AGCATTGCTTCTATGATCTTAGGAGCACTGGCCGCCATGGCCCAAACGAA  
AGCATTGCTTCTATGATCTTAGGAGCACTGGCCGCCATGGCCCAAACGAA  
AGCATTGCTTCTATGATCTTAGGAGCACTGGCCGCCATGGCCCAAACGAA  
AGCATTGCTTCTATGATCTTAGGAGCACTGGCCGCCATGGCCCAAACGAA  
AGCATTGCTTCTATGATCTTAGGAGCACTGGCCGCCATGGCCCAAACGAA  
AGCATTGCTTCTATGATTTTTAGGAGCACTGGCTGCCATGGCCAAAACAA  
AGCATCGCTTTTATGATTTTTAGGAGCACTGGCTGCCATGGCCAAAACAA

Arabidopsis thaliana  
Brassica napus

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Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_nad2  
RRII105\_nad2  
RRIC110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

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AGTAAAAAGACUTCTAGCTUATAGTTCAATTGGACATGTAGGTTATATTC  
AGTAAAAAGACUTCTAGCTUATAGTTCAATTGGACATGTAGGTTATATTC  
AGTAAAAAGACUTCTAGCTUATAGTTCAATTGGACATGTAGGTTATATTC  
AGTAAAAAGACNTCTAGCTNATAGTTCAATTGGACATGTAGGTTATATTC  
AGTAAAAAGACNTCTAGCTNATAGTTCAATTGGACATGTAGGTTATATTC  
AGTAAAAAGACNTCTAGCTNATAGTTCAATTGGACATGTAGGTTATATTC  
AGTAAAAAGACTTTTATAGTTCTATTGGACACGTAGGTTATCTTC  
AGTAAAAAGACTTTTATAGTTCTATTGGACACGTAGGTTATCTTC

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_nad2  
RRII105\_nad2  
RRIC110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

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GTACTGGGTTCTCATGTGGAACCATAGAAGGAATTCAATCACTACTAATT  
GTACTGGGTTCTCATGTGGAACCATAGAAGGAATTCAATCACTACTAATT  
GTACTGGGTTCTCATGTGGAACCATAGAAGGAATTCAATCACTACTAATT  
GTACTGGGTTCTCATGTGGAACCATAGAAGGAATTCAATCACTACTAATT  
GTACTGGGTTCTCATGTGGAACCATAGAAGGAATTCAATCACTACTAATT  
GTACTGGGTTCTCATGTGGAACCATAGAAGGAATTCAATCACTACTAATT  
GTACTGGGTTCTCATGTGGAACCATAGAAGGAATTCAATCACTACTAATT  
CAATTGGTTTTTTCATGTGGAACCATAGAAGGGATTCAATCACTATTAATT  
CAATTGGTTTTTTCACGTGGAACCTATAGAAGGGATTCAATCACTATTAATT

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_nad2  
RRII105\_nad2  
RRIC110\_nad2  
PB235\_nad2  
RRIT251\_nad2  
RRIM600\_nad2  
Megaceros aenigmaticus  
Phaeoceros laevis

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GGTATCTTTATTTATGCATTAATGACGATAGATGCATTCGCCATAGTTTT  
GGTATCTTTATTTATGCATTAATGACGATAGATGCATTCGCCATAGTTTT  
GGTATCTTTATTTATGCATTAATGACGATAGATGCATTCGCCATAGTTTT  
GGTATCTTTATTTATGCATTAATGACGATAGATGCATTCGCCATAGTTTT  
GGTATCTTTATTTATGCATTAATGACGATAGATGCATTCGCCATAGTTTT  
GGTATCTTTATTTATGCATTAATGACGATAGATGCATTCGCCATAGTTTT  
GCTATGTTTATTTATGTATTAATGACTATCAATGTATTTCGTCATAGTTTT  
GCTATGTTTATTTATGTATTAATGACTATCAATGTATCCGTCACAGTTTT

Arabidopsis thaliana  
Brassica napus  
Lotus japonicus  
Citrullus lanatus  
Cucurbita pepo  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
BPM24\_nad2  
RRII105\_nad2

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AGCATTACGGCAAACCCGTGTCAAATATATAGCGGATTTGGGCGCTCTAG  
AGCATTACGGCAAACCCGTGTCAAATATATAGCGGATTTGGGCGCTCTAG

RRIC110_nad2	AGCATTACGGCAAACCCGTGTCAAATATATAGCGGATTTGGGCGCTCTAG
PB235_nad2	AGCATTACGGCAAACCCGTGTCAAATATATAGCGGATTTGGGCGCTCTAG
RRIT251_nad2	AGCATTACGGCAAACCCGTGTCAAATATATAGCGGATTTGGGCGCTCTAG
RRIM600_nad2	AGCATTACGGCAAACCCGTGTCAAATATATAGCGGATTTGGGCGCTCTAG
Megaceros aenigmaticus	AGCACTACGTCAAACCCGCCTCAAATATATAGCGGATTTAGGTGCTTTAG
Phaeoceros laevis	AGCATTACGTAAAAACCGCCTCAAATATATAGCGGATTTAGGTGCTTTAG

Arabidopsis thaliana	-----
Brassica napus	-----
Lotus japonicus	-----
Citrullus lanatus	-----
Cucurbita pepo	-----
Beta vulgaris maritima	-----
Beta vulgaris vulgaris	-----
Silene latifolia	-----
BPM24_nad2	CCAAAACGAATCCTATTTU <u>GG</u> CTATTACCTTCTCCATTACTATGTTCTCA
RRII105_nad2	CCAAAACGAATCCTATTTU <u>GG</u> CTATTACCTTCTCCATTACTATGTTCTCA
RRIC110_nad2	CCAAAACGAATCCTATTTU <u>GG</u> CTATTACCTTCTCCATTACTATGTTCTCA
PB235_nad2	CCAAAACGAATCCTATTTU <u>GG</u> CTATTACCTTCTCCATTACTATGTTCTCA
RRIT251_nad2	CCAAAACGAATCCTATTTU <u>GG</u> CTATTACCTTCTCCATTACTATGTTCTCA
RRIM600_nad2	CCAAAACGAATCCTATTTNGGCTATTACCTTCTCCATTACTATGTTCTCA
Megaceros aenigmaticus	CCAAAACGAATCGTATTTTAGCAATTACCTTGCTTACTATGTTTCA
Phaeoceros laevis	CCAAAACGAATCGTATTTTAGCAATTACCTTGCTTACTATGTTCTCA

Arabidopsis thaliana	-----
Brassica napus	-----
Lotus japonicus	-----
Citrullus lanatus	-----
Cucurbita pepo	-----
Beta vulgaris maritima	-----
Beta vulgaris vulgaris	-----
Silene latifolia	-----
BPM24_nad2	TACGCAGGAATACCCCGTTAGCCGGCTTTTGTAGCAAATTCTATTTGTT
RRII105_nad2	TACGCAGGAATACCCCGTTAGCCGGCTTTTGTAGCAAATTCTATTTGTT
RRIC110_nad2	TACGCAGGAATACCCCGTTAGCCGGCTTTTGTAGCAAATTCTATTTGTT
PB235_nad2	TACGCAGGAATACCCCGTTAGCCGGCTTTTGTAGCAAATTCTATTTGTT
RRIT251_nad2	TACGCAGGAATACCCCGTTAGCCGGCTTTTGTAGCAAATTCTATTTGTT
RRIM600_nad2	TACGCAGGAATACCCCGTTAGCCGGCTTTTGTAGCAAATTCTATTTGTT
Megaceros aenigmaticus	TACGCAGGAATACCTCCGTTAGCTGGATTTTGTAGCAAATTCTATTTATT
Phaeoceros laevis	TACGCAGGAATACTTTTGTAGCTGGATTTTGTAGCAAATTCTATTTATT

Arabidopsis thaliana	-----
Brassica napus	-----
Lotus japonicus	-----
Citrullus lanatus	-----
Cucurbita pepo	-----
Beta vulgaris maritima	-----
Beta vulgaris vulgaris	-----
Silene latifolia	-----
BPM24_nad2	CTTCGCCGCTTTGGGTTGTGGGGCTTACTTCTAGCCCCAGTGGGAGTAG
RRII105_nad2	CTTCGCCGCTTTGGGTTGTGGGGCTTACTTCTAGCCCCAGTGGGAGTAG
RRIC110_nad2	CTTCGCCGCTTTGGGTTGTGGGGCTTACTTCTAGCCCCAGTGGGAGTAG
PB235_nad2	CTTCGCCGCTTTGGGTTGTGGGGCTTACTTCTAGCCCCAGTGGGAGTAG
RRIT251_nad2	CTTCGCCGCTTTGGGTTGTGGGGCTTACTTCTAGCCCCAGTGGGAGTAG
RRIM600_nad2	CTTCGCCGCTTTGGGTTGTGGGGCTTACTTCTAGCCCCAGTGGGAGTAG
Megaceros aenigmaticus	TTCCGCCGCTCCAGGCTGTGGAGCTTACTCACTAGCTTTTGTAGGAATAG
Phaeoceros laevis	TTTCGCTGCTCTAGGCTGTGGGGCTTACTCACTAGCTTTTGTAGGAATAG

Arabidopsis thaliana -----  
Brassica napus -----  
Lotus japonicus -----  
Citrullus lanatus -----  
Cucurbita pepo -----  
Beta vulgaris maritima -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
BPM24\_nad2 TGACTAGCGTTATAGGTCGTTTTTATTATATACGCTTAGCGAAAAGAATG  
RRII105\_nad2 TGACTAGCGTTATAGGTCGTTTTTATTATATACGCTTAGCGAAAAGAATG  
RRIC110\_nad2 TGACTAGCGTTATAGGTCGTTTTTATTATATACGCTTAGCGAAAAGAATG  
PB235\_nad2 TGACTAGCGTTATAGGTCGTTTTTATTATATACGCTTAGCGAAAAGAATG  
RRIT251\_nad2 TGACTAGCGTTATAGGTCGTTTTTATTATATACGCTTAGCGAAAAGAATG  
RRIM600\_nad2 TGACTAGCGTTATAGGTCGTTTTTATTATATACGCTTAGCGAAAAGAATG  
Megaceros aenigmaticus TTACTAGCGTTATCAGTTGTTTTTATTACATACGCTTCGTGAAAATAATG  
Phaeoceros laevis TTACTAGCGTTACCAGTCGTTTTTATTATATACGCTTTGTGAAAATAATG

Arabidopsis thaliana -----  
Brassica napus -----  
Lotus japonicus -----  
Citrullus lanatus -----  
Cucurbita pepo -----  
Beta vulgaris maritima -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
BPM24\_nad2 TTTTTTGATACACCTAGGACATGGATTCTATATGAACCAATGGATCGTAA  
RRII105\_nad2 TTTTTTGATACACCTAGGACATGGATTCTATATGAACCAATGGATCGTAA  
RRIC110\_nad2 TTTTTTGATACACCTAGGACATGGATTCTATATGAACCAATGGATCGTAA  
PB235\_nad2 TTTTTTGATACACCTAGGACATGGATTCTATATGAACCAATGGATCGTAA  
RRIT251\_nad2 TTTTTTGATACACCTAGGACATGGATTCTATATGAACCAATGGATCGTAA  
RRIM600\_nad2 TTTTTTGATACACCTAGGACATGGATTCTATATGAACCAATGGATCGTAA  
Megaceros aenigmaticus TATTTTCGATACACCCGAAACATGGATTATATATAAACCCATGGATCGTGA  
Phaeoceros laevis TATTTTCGATACACCCGAAACATGGATTATATATAAACCCATGGATCGTGA

Arabidopsis thaliana -----  
Brassica napus -----  
Lotus japonicus -----  
Citrullus lanatus -----  
Cucurbita pepo -----  
Beta vulgaris maritima -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
BPM24\_nad2 CAAGTCGTTACTACTAGCAATGACTTCCTCTTTTATTACTTUATCCTTTT  
RRII105\_nad2 CAAGTCGTTACTACTAGCAATGACTTCCTCTTTTATTACTTUATCCTTTT  
RRIC110\_nad2 CAAGTCGTTACTACTAGCAATGACTTCCTCTTTTATTACTTUATCCTTTT  
PB235\_nad2 CAAGTCGTTACTACTAGCAATGACTTCCTCTTTTATTACTTUATCCTTTT  
RRIT251\_nad2 CAAGTCGTTACTACTAGCAATGACTTCCTCTTTTATTACTTUATCCTTTT  
RRIM600\_nad2 CAAGTCGTTACTACTAGCAATGACTTCCTCTTTTATTACTTUATCCTTTT  
Megaceros aenigmaticus GAAATCGTTACTATTAGCAATTTATTCTTCTACCCTTTCTTTCTTTT  
Phaeoceros laevis GAAATTGTTACTATTAGCAATTTATTCTTCTACCCTTTCTTTCTTTT

Arabidopsis thaliana -----  
Brassica napus -----  
Lotus japonicus -----  
Citrullus lanatus -----  
Cucurbita pepo -----  
Beta vulgaris maritima -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----

BPM24\_nad2 TATATCCCTCTCCCTTGTTCTCAGTTACTCATCAAATGGCACTCAGTTCA  
 RRII105\_nad2 TATATCCCTCTCCCTTGTTCTCAGTTACTCATCAAATGGCACTCAGTTCA  
 RRIC110\_nad2 TATATCCCTCTCCCTTGTTCTCAGTTACTCATCAAATGGCACTCAGTTCA  
 PB235\_nad2 TATATCCCTCTCCCTTGTTCTCAGTTACTCATCAAATGGCACTCAGTTCA  
 RRIT251\_nad2 TATATCCCTCTCCCTTGTTCTCAGTTACTCATCAAATGGCACTCAGTTCA  
 RRIM600\_nad2 TATATCCCTCTCCCTTGTTCTCAGTTACTCATCAAATGGCACTCAGTTCA  
 Megaceros aenigmaticus TATATCCTTCTCCCTCGTTTTTAGTTACTCACGAAATGGACCAAGTTTA  
 Phaeoceros laevis TATATCCTTCTCCCTTGTTTTAGTTACTCACGAAATGGCGCTAAGTTTA

Arabidopsis thaliana -----  
 Brassica napus -----  
 Lotus japonicus -----  
 Citrullus lanatus -----  
 Cucurbita pepo -----  
 Beta vulgaris maritima -----  
 Beta vulgaris vulgaris -----  
 Silene latifolia -----  
 BPM24\_nad2 TATCTTTAA  
 RRII105\_nad2 TATCTTTAA  
 RRIC110\_nad2 TATCTTTAA  
 PB235\_nad2 TATCTTTAA  
 RRIT251\_nad2 TATCTTTAA  
 RRIM600\_nad2 TATCTTTAA  
 Megaceros aenigmaticus TGTTTGTA  
 Phaeoceros laevis TGTTTGTA

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**nad4L multiple sequence alignment**

Arabidopsis thaliana ---CATCTAATAACATTT--GAATTTATCTTAGATTCCACGTTCCCGAAA  
 Brassica napus ---CATCTAATAACATTT--GAATTTCTCTTAGATTACACGTTCCCGAAA  
 BPM24\_nad4L -----A  
 RRII105\_nad4L -----A  
 Citrullus lanatus ---CTTTTTATAACATTT--GAATTTCTCTGACATTCTACGTTCCCGAAA  
 Cucurbita pepo -CTGGAGTTATAACATTT--GAATTTCTCTGACATTCTACGTTCCCGAAA  
 Silene latifolia ---GGAGTTATAACATTT--GAATTTCTCTATTATTCTACGTTCCCGAAA  
 Vigna radiata -TATTGGTTATAACATTT--GAATTTCTTTACATTCCACGTTTCCGAAA  
 RRIT251\_nad4L -----A  
 Oryza sativa Indica -TAAGCCTCACATAATTT--GAATTTCTCTGACATTCCATGTTTCCGAAU  
 Oryza sativa Japonica -TAGGCCTCACATAATTT--GAATTTCTCTGACATTCCATGTTTCCGAAA  
 PB235\_nad4L -----A  
 RRIC110\_nad4L -----A  
 RRIM600\_nad4L -----A  
 Cycas taitungensis -----ATTAAGTTCCTTCCAGAATTCCCTCCTCCGTTCCACGTTCCCGAAA  
 Pleurozia purpurea -----A  
 Megaceros aenigmaticus GCTAGGCTGAAGTAGTGTT-GGACACCGGTAAAA--AAAGACTCTTATTA  
 Phaeoceros laevis --TAGGCTGAAGTAGTGTT-GGACACGGGTAAAA--AAAGACTCTTATTA

Arabidopsis thaliana TGGATCCTTATCAAATATTTTACATTTTCTATGATTATTTUATTTTTAGGT  
 Brassica napus TGGATCUATCAAATATTTTACATTTTCTATGATTATTTUATTTTTAGGT  
 BPM24\_nad4L TGGATCUATCAAATATTTTACATTTTCTATGATCATCTUATTTTTAGGT  
 RRII105\_nad4L TGGATCUATCAAATATTTTACATTTTCTATGATCATCTUATTTTTAGGT  
 Citrullus lanatus UGGATCCTATCAAATATTTTACATTTTCTATGATUATCTUATTTTTAGGT  
 Cucurbita pepo UGGATCCTATCAAATATTTTACATTTTCTATGATUATCTUATTTTTAGGT  
 Silene latifolia UGGATTCTATCAAATATTTTACATTTTCTATGATCATTTTTATTUAGGT  
 Vigna radiata UGGATCCTATCAAATATTTTACATTTTCTATGATCATCTCTATTTTTAGGT  
 RRIT251\_nad4L TGGATCCTATCAAATATTTTACATTTTCTATGATCATCTNTATTTTTAGGT  
 Oryza sativa Indica CGGATCCTATAAAATATTTTCACTTTTTCTATGATCATCTCTATTTTTAGGT  
 Oryza sativa Japonica UGGATCUATATAAAATATTTTCACTTTTTCTATGATCATCTUATTTTTAGGT  
 PB235\_nad4L TGGATCUATCAAATATTTTACATTTTCTATGATCATCTUATTTTTAGGT



RRIC110\_nad4L  
RRIM600\_nad4L  
Cycas taitungensis  
Pleurozia purpurea  
Megaceros aenigmaticus  
Phaeoceros laevis

TGGATCUATCAAATATTTACATTTTCTATGATCATCTNTATTTTAGGT  
TGGATCCTATCAAATATTTACATTTTCTATGATCATCTCTATTTTAGGT  
TGGATCTGTCAAATATTTAACATTTTCTATGATCATTCTCTCAGGT  
UGGATCTAGTAAAATATTTAACATTTTCTATGATTCTTTTTCTTTAGGT  
TGGATCTAGTCAACTATTTAACATTCTCCATGATTCCTTTTTTTGGGT  
TGGATCTAGTCAACTATTTAACATTCTATGATTCCTTTTTTTTTGGGT  
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Arabidopsis thaliana  
Brassica napus  
BPM24\_nad4L  
RRII105\_nad4L  
Citrullus lanatus  
Cucurbita pepo  
Silene latifolia  
Vigna radiata  
RRIT251\_nad4L  
Oryza sativa Indica  
Oryza sativa Japonica  
PB235\_nad4L  
RRIC110\_nad4L  
RRIM600\_nad4L  
Cycas taitungensis  
Pleurozia purpurea  
Megaceros aenigmaticus  
Phaeoceros laevis

ATTUGGGAATCCTCCTTAATAGACGAAATATTCUATTTATGTUAATGUC  
ATTUGGGAATCCTCCTTAATAGACGAAATATTCUATTTATGTUAATGUC  
ATTCGGGAATCCTCCTTAATAGACGAAATATTCCTATTATGTCAATGCC  
ATTCGGGAATCCTCCTTAATAGACGAAATATTCUATTTATGTUAATGUC  
ATTUGGGAATCCTCCTTAATAGACGAAATATTCUATTTATGTUAATGUC  
ATTUGGGAATCCTCCTTAATAGACGAAATATTCCTATTATGTUAATGUC  
ATTCGGGAATCCTCCTTAATAGACGAAATATTCCTATTATGTCAATGCC  
ATTCGGGAATCCTCCTTAATAGACGAAATATTCCTATTATGTCAATGCC  
ATTUGGGAATCCTCCTTAATAGACGAAATATTCCTATTATGTUAATGUC  
ATTCGGGAATCCTCCTTAATAGACGAAATATTCCTATTATGTCAATGCC  
ATTCGGGAATCCTCCTTAATAGACGAAATATTCCTATTATGTCAATGCC  
ATTCGGGAATCCTCCTTAATAGACGAAATATTCCTATTATGTCAATGCC  
ATTCGGGAATCCTCCTGAATAGACGAAATATTATTATTATGTCAATGTC  
ATTTGGGAATTTTCTTAAATAGAAAAAATATTCTTATTATGTCAATGCC  
ATTTGGGAATTTTCCGAATAAAAAGAAATATTCTTATTATGCCAACGCT  
ATTTGGGAATTTTCCGAATAAAAAGAAATATTCTTATTATGCCAACGCT  
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Arabidopsis thaliana  
Brassica napus  
BPM24\_nad4L  
RRII105\_nad4L  
Citrullus lanatus  
Cucurbita pepo  
Silene latifolia  
Vigna radiata  
RRIT251\_nad4L  
Oryza sativa Indica  
Oryza sativa Japonica  
PB235\_nad4L  
RRIC110\_nad4L  
RRIM600\_nad4L  
Cycas taitungensis  
Pleurozia purpurea  
Megaceros aenigmaticus  
Phaeoceros laevis

AATTGAATUAATGTTATTAGCTGTGAATTCGAACTTTTTGGTATTTTCCG  
AATTGAATUAATGTTATTAGCTGTGAATTUGAACTTTTTGGTATTTTCCG  
AATTGAATCAATGTTATTAGCTGTGAATTTGAACTTTTTGGTATTTTCCG  
AATTGAATUAATGTTATTAGCTGTGAATTUGAACTTTTTGGTATTTTCCG  
AATGGAATUAATGTTATTAGCTGTGAATTUGAACTTTTTGGTATTTTCCG  
AATTGAATUAATGTTATTAGCTGTGAATTUGAACTTTTTGGTCTTTTCTG  
AATTGAATCAATGTTATTAGCTGTGAATTCGAACTTTTTGGTATTTTCCG  
AATTGAATCAATGTTATTAGCTGTGAATTTGAACTTTTTGGTATTTTCCG  
AATTGAATCAATGTTATTAGCTGTCAATTTGAACTTTTTGGTATTTTCCG  
AATTGAATUAATGTTATTAGCTGTCAATTTGAACTTTTTGGTATTTTCCG  
AATTGAATCAATGTTATTAGCTGTGAATTTGAACTTTTTGGTATTTTCCG  
AATTGAATCAATGTTATTAGCTGTGAATTTGAACTTTTTGGTATTTTCCG  
AATTGAATCAATGTTACTAGCTGCCAATTCGAACTTTTTGGTATTTTCCG  
AATTGAGTTAATGTTACTTGCTGTCAATTTGAACTTTTTGGTATTTTCTG  
GATTGAGTCAATGTTACTTGCTGCAATTTGAACTTTTGGTATTTCTGG  
GATTGAGTTAATGTTACTTGCTGCAATTTGAACTTTTGGTATTTCTGG  
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Arabidopsis thaliana  
Brassica napus  
BPM24\_nad4L  
RRII105\_nad4L  
Citrullus lanatus  
Cucurbita pepo  
Silene latifolia  
Vigna radiata  
RRIT251\_nad4L  
Oryza sativa Indica  
Oryza sativa Japonica  
PB235\_nad4L  
RRIC110\_nad4L  
RRIM600\_nad4L

TTTCTTUGGATGATATGATGGGTCAAGTATTTGCTTUAATGGTTCUAACG  
TTTCTTUGGATGATATGATGGGTCAAGTATTTGCTTCATTGGTTCCAACG  
TTTCTTCGGATGATATGATGGGTCAATCATTGCTTCATTGGTTCUAACG  
TTTCTTCGGATGATATGATGGGTCAATCATTGCTTCATTGGTTCUAACG  
TTTCTTUGGATGATATGATGGGTCAATUAATTTGCTTUAATGGTTCUAACG  
TTTCTTUGGATGATATGATGGGTCAATUAATTTGCTTUAATGGTTCUAACG  
TTTCTTUGGATGATATGATGGGTCAATATTATTGCTTTATTGGTTCUAACG  
TTTCTTCGGATGATATGATGGGTCAATCATTGCTTCATTGGTTCCAACG  
TTTCTTCGGATGATATGATGGGTCAATCATTGCTTCATTGGTTCCAACG  
TTTCTTTGGATGATATGATGGGTCAATCATTGCTTCATTAGTTCCAACA  
TTTCTTTGGATGATATGATGGGTCAATUAATTTGCTTUAATAGTTCUACA  
TTTCTTCGGATGATATGATGGGTCAATCATTGCTTCATTGGTTCUAACG  
TTTCTTCGGATGATATGATGGGTCAATCATTGCTTCATTGGTTCUAACG  
TTTCTTCGGATGATATGATGGGTCAATCATTGCTTCATTGGTTCCAACG



Megaceros aenigmaticus  
Phaeoceros laevis

AAACACAAAAA--CCAAAAGAATTGTTTTCTTA--GAAGTCTATTTCTGA  
AAACACAAAAA--CCAAAATCATTTTTTTCTTCTCGAATACGAAGTA--  
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Arabidopsis thaliana  
Brassica napus  
BPM24\_nad4L  
RRII105\_nad4L  
Citrullus lanatus  
Cucurbita pepo  
Silene latifolia  
Vigna radiata  
RRIT251\_nad4L  
Oryza sativa Indica  
Oryza sativa Japonica  
PB235\_nad4L  
RRIC110\_nad4L  
RRIM600\_nad4L  
Cycas taitungensis  
Pleurozia purpurea  
Megaceros aenigmaticus  
Phaeoceros laevis

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**nad4 multiple sequence alignment**

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
BPM24\_nad4  
RRII105\_nad4  
RRIC110\_nad4  
RRIT251\_nad4  
PB235\_nad4  
RRIM600\_nad4  
Oryza sativa Japonica  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

ATGTTAGAACATTTCTGTGAATGCTATTUTGATCTAAGTGGTCTTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTUTGATCTAAGTGGTCTTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTTGATCTAAGTGGTCTTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTUAACTAAGTGGTCTTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTUAACTAAGTGGTCTTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTUTGATTTAAGTGGTCUTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTUTGATTTAAGTGGTCUTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTUTGATCTAAGTGGTCUTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTUTGATCTAAGTGGTCUTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTUTGATCTAAGTGGTCUTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTUTGATCTAAGTGGTCUTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTUTGATCTAAGTGGTCUTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTUTGATCTAAGTGGTCUTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTCTGATCTAAGTGGTCCTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTTGATCTAAGTGGTCNTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTTGATCTAAGTGGTCUTATTCT  
ATGTTAGAACATTTCTGTGAATGCTATTTGATCTAAGTGGTCUTATTCT  
AUGTTACAATTTCCAGCTTTCACCTCATCTCAATCTAAGTGGTCTTATTTT  
ACGTTACAATTTCCAGCTTTCATCTCATCTCAATCTAAGTGGTCTTATTTT  
AUGTTACAAGTTTTAGCTCCATTTTCTTCCAATTTAAGTGGTCTCATTTT  
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Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
BPM24\_nad4  
RRII105\_nad4  
RRIC110\_nad4  
RRIT251\_nad4  
PB235\_nad4

GTGTCCTGTGCTAGGAAGCATTATCTTCTTTTCATTCCAAATTC AAGAA  
GTGTCCTGTGCTAGGAAGCATTATCTTCTTTTCATTCCAAATTC AAGAA  
GTGTCCTGTGCTAGGAAGCATTATCTTCTTTTCATTCCAAATTC AAGAA  
GTGTCCTGTGCTAGGAAGCATTATCTTCTTTTCATTCCAAATTC AAGAA  
GTGTCCTGTGCTAGGAAGCATTATCTTCTTTTCATTCCAAATTC AAGAA  
GTGTCCTGTGCTAGGAAGCATTATCTTCTTTTCATTCCAAATTC AAGAA  
GTGTCCTGTGCTAGGAAGCATTATCTTCTTTTCATTCCAAATTC AAGAA  
GTGTCCTGTGCTAGGAAGCATTATCTTCTTTTCATTCCAAATTC AAGAA  
GTGTCCTGTGCTAGGAAGCATTATCTTCTTTTCATTCCAAATTC AAGAA  
ATGTCCCCTGTGCTAGGAAGCATTACTCCTCTTTTCATTCCAAATTC AAGAA  
ATGTCCCCTGTGCTAGGAAGCATTACTCCTCTTTTCATTCCAAATTC AAGAA  
ATGTCCCCTGTGCTAGGAAGCATTACTCCTCTTTTCATTCCAAATTC AAGAA  
ATGTCCCCTGTGCTAGGAAGCATTACTCCTCTTTTCATTCCAAATTC AAGAA  
ATGTCCCCTGTGCTAGGAAGCATTACTCCTCTTTTCATTCCAAATTC AAGAA

RRIM600\_nad4  
Oryza sativa Japonica  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

ATGTC~~CCC~~GTGCTAGGAAGCATTACTCCTCTTTTTATTCCAAATTCAGAA  
CTGT~~CCC~~GTGCTAGGAAGCATTUTCTTCTTTTTATTCCAAATTCCTCAA  
GTGT~~CCC~~GTGCTAGGAAGCATTATTCTCTTTTTCTTCCAAATTCGAGAA  
GCGT~~CCC~~TTTGTTGGGAAGCATTATTCTTCTCGTTATCCCTGATTCAAGAA  
GCGT~~CCC~~TTTGCTGGGAAGCATTATTCTTCTCTTATTCTGATTCAAGAA  
GCT~~CCC~~TTTGCTAGGAAGCCTTATTATTTGGTGACCCCGAATTCGAGAG  
\*    \*\* \*    \*\*\*\*\* \*\* \*    \* \* \* \*    \*\* \*\*    \*

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
BPM24\_nad4  
RRII105\_nad4  
RRIC110\_nad4  
RRIT251\_nad4  
PB235\_nad4  
RRIM600\_nad4  
Oryza sativa Japonica  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

TACGATUGATACGATTGATTGGTCTGTGCGCTTCTCTTATTACTTTTTTG  
TACGATUGATACGATTGATTGGTCTGTGCGCTTCTCTTATTACTTTTTTG  
TACGATUGATACGATTGATTGGTCTGTGCGCTTCTCTTATTACTTTTTTG  
TACGACUGATACGATTAATTGGTUTGTGTGCCTCTCTTATTACTTTTTTG  
TACGACUGATACGATTAATTGGTUTGTGTGCCTCTCTTATTACTTTTTTG  
TACGACUGATACGATTGATTGGTCTATGTGCCTCTCTTATTACTTTTTTG  
TACGCCUGATACGATTGATTGGTCTATGTGCCTCTCTTATTACTTTTTTG  
TACGACUGATACGATTGATTGGTCTGTGTGCCTCTCTTATTACTTTTTTG  
TACGACUGATACGATTGATTGGTCTGTGTGCCTCTCTTATTACTTTTTTG  
TACGACUGATACGATTGATTGGTCTGTGTGCCTCTCTTATTACTTTTTTG  
TACGACCCGAATGATTGATTGGTCTGTGTGCCTCTCTTATTACTTTTTTG  
TACGACCCGAATGATTGATTGGTCTGTGTGCCTCTCTTATTACTTTTTTG  
TACGACCCGAATGATTGATTGGTCTGTGTGCCTCTCTTATTACTTTTTTG  
TACGACCCGAATGATTGATTGGTCTGTGTGCCTCTCTTATTACTTTTTTG  
TACGACCCGAATGATTGATTGGTCTGTGTGCCTCTCTTATTACTTTTTTG  
TAAGACTGATACGATTGATTGGTCTGTGCGTTCTCTTATTACTTTTTTG  
TGCGACTGATACGATCTATTGGTCTGTGCGCTCTCTTCTTACTTTTTCG  
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TACGTCTGATACGAGGTATACAATTTGGACCTCTTTGATCACTTTTTTA  
\*            \*\*\*\*\*    \*\*            \*    \* \* \* \*    \*\* \*\*    \*

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
BPM24\_nad4  
RRII105\_nad4  
RRIC110\_nad4  
RRIT251\_nad4  
PB235\_nad4  
RRIM600\_nad4  
Oryza sativa Japonica  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

TATTCTCUTGTTCTTUGGATACAATTTGATCCTTCTACGGCCAAATUTCA  
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TATTCCCTGTTCTTTCGGATACAATTCGATCCTTCTACGGCCAAATCTCA  
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TATTCTCCCTTTTCTTGGATAGAATTCGATAATTCTACAGCCAAATTTCCA  
TATTCTCCTTTTTTTTTGGATAGAATTCGATAATTCTACAGCCAAATTTCA  
TATTCTCTTTTTTTTTGGATACGCTTCGAGAATGATACAGCAAATTTCA  
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Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
BPM24\_nad4

ATTTGTGGAAGCCTTCGATGGCTTCTTATGAAAACATCCATTTTTATT  
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ATTTGTGGAAGCCTTCGATGGCTTCTTATGAAAACATAAATTTTTATT  
ATTTGTGGAAGCCTTCGATGGCTTCTTATGAAAACATCAATTTTTATT  
ATTTGTGGAAGCCTTCGATGGCTTCTTATGAAAACATCAATTTTTATT  
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ATTTGTGGAAGCCTTCGATGGCTTCTTATGAAAACATCAATTTTTATT  
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ATTTGTGGAAGCCTTCGATGGCTTCTTATGAAAACATCAATTTTTATT  
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ATTTGTGGAAGCCTTCGATGGCTTCTTATGAGAACATAAATTTTTATT

RRII105\_nad4  
RRIC110\_nad4  
RRIT251\_nad4  
PB235\_nad4  
RRIM600\_nad4  
Oryza sativa Japonica  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

ATTTGTGGAAGCCTTCGATGGCTTCCTTATGAGAACATAAATTTTTATT  
ATTTGTGGAAGCCTTCGATGGCTTCCTTATGAGAACATAAATTTTTATT  
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ATTTGTGGAAGCCTTCGATGGCTTCCTTATGGAAGCATCAATTTGTATA  
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ATTTGTGGAAGCCTTCGATGGCTTCCTTATCAAACATCAATTTATATA  
GTTTGTGGAAGCCTTCGATGGCTTCCTTATCAAACATCAATTTCTATA  
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Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
BPM24\_nad4  
RRII105\_nad4  
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RRIT251\_nad4  
PB235\_nad4  
RRIM600\_nad4  
Oryza sativa Japonica  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

TGGGTATAGAUUGGTATCTCTTTATTCTTCGTGATATTGACCACATTTTTG  
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TGGGTATAGACGGTATCTCTTTATTCTTCGTGATATTGACCACATTTTTG  
TGGGTATAGACGGTATCTCTTTATTCTTCGTGATATTGACCACATTTCTG  
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TAGGTATAGATGGTATCTCGTTATTCTTTGTGATCTTGACCACGTTTTTA  
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Beta vulgaris vulgaris  
Silene latifolia  
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RRIM600\_nad4  
Oryza sativa Japonica  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

ATCCCTATTTGCATTTTAGTGGGTTGGTCTGGTATGAGAAGTTATGGGAA  
ATCCCTATTTGCATTTTAGTGGGTTGGTCTGGTATGAGAAGTTATGGGAA  
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ATCCCTATTTGCATTTUAGTGGGTTGGTCTGGTATGAGAAGTTATGGGAA  
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ATTCCTATTCGCATTTTCGGTAGGTTGGTCCAGTATCAAGAGTTATAAGAA  
ATTCCTATTTGCATTTCTGTTGGCTTTTATAGCGTCAAGAGTTATAAAAA  
\* \*\*\*\*\* \* \*\* \*\* \* \* \* \* \* \*\*\*\*\* \*\*

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
Citrullus lanatus

AGAGTATATTAUAGCATUTCTAATTUGTGAATTTCTAATGATCGCCGTGT  
AGAGTATATTAUAGCATUTCTAATTUGTGAATTTCTAATGATCGCCGTGT  
AGAGTATATTAUAGCATUTCTAATTUGTGAATTTCTAATGATCGCCGTGT  
AGAGTATATTAUAGCATTTTAAATTUGTGAATTTCTAATGATCGCCGTGT  
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AGAGTATATTAUAGCATUTCTAATTUGTGAATTTCTAATGATCGCCGTGT

Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
BPM24\_nad4  
RRII105\_nad4  
RRIC110\_nad4  
RRIT251\_nad4  
PB235\_nad4  
RRIM600\_nad4  
Oryza sativa Japonica  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

AGAGTATATTAUAGCATU<sup>U</sup>TCTAATTU<sup>U</sup>GTGAATTTCTAATGATCGCCGTGT  
AGAGTATATTAUAGCATU<sup>U</sup>TCTAATTU<sup>U</sup>GTGAATTTCTAATGATCGCCGTGT  
AGAGTATATTAUAGCATU<sup>U</sup>TCTAATTU<sup>U</sup>GTGAATTTCTAATGATCGCCGTGT  
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AGAGTATATTACAGCATCTCTAATTCGTGAATTTCTAATGATCGCCGTGT  
AGAGTATATTAUAGCATTTCTAATTU<sup>U</sup>GTGAATTTCTAATGATCGCCGTGT  
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AGAGTATATGATAGCGTTTTTAAATTCGTGAATCTCTTATGATTGCTGTGT  
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AGAGTATATGATAGCGTTTTTAAATTCGTGAATCTTTCCCAATTGCTGTGT  
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PB235\_nad4  
RRIM600\_nad4  
Oryza sativa Japonica  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

TCTGCATGCTGGATCTTCTACTATTCTATGTTU<sup>U</sup>TTU<sup>U</sup>CGAAAGCGTGC<sup>U</sup>A  
TCTGCATGCTGGATCTTCTACTATTCTATGTTU<sup>U</sup>TTU<sup>U</sup>CGAAAGCGTGC<sup>U</sup>A  
TCTGCATGCTGGATCTTCTACTATTCTATGTTU<sup>U</sup>TTU<sup>U</sup>CGAAAGCGTGC<sup>U</sup>A  
TU<sup>U</sup>GCATGCTAGATCTT<sup>U</sup>TACTATTCTATGTTTTCCCGAAAGCGTGC<sup>U</sup>A  
TCU<sup>U</sup>GCATGCTGGATCTTCTACTATTCTATGTTTTU<sup>U</sup>CGAAAGCGTGC<sup>U</sup>A  
TCU<sup>U</sup>GCATGCTGGATC<sup>U</sup>TCTACTATTCTATGTTU<sup>U</sup>TTU<sup>U</sup>CGAAAGCGTGC<sup>U</sup>A  
TCTGCATGCTGGATC<sup>U</sup>TCTACTATTCTATGTTU<sup>U</sup>TTU<sup>U</sup>CGAAAGCGTGC<sup>U</sup>A  
TCU<sup>U</sup>GCATGCTGGATC<sup>U</sup>TCTACTATTCTATGTTU<sup>U</sup>TTU<sup>U</sup>CGAAAGCGTGC<sup>U</sup>A  
TCU<sup>U</sup>GCATGCTGGATC<sup>U</sup>TCTACTATTCTATGTTU<sup>U</sup>TTU<sup>U</sup>CGAAAGCGTGC<sup>U</sup>A  
TCCGCATGCTGGATCCTCTACTATTCTATGTTCTTCCCGAAAGCGTGC<sup>U</sup>A  
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TCCGCATGCTGGATCCTCTACTATTCTATGTTCTTCCCGAAAGCGTGC<sup>U</sup>A  
TCCGCATGCTGGATCCTCTACTATTCTATGTTCTTCCCGAAAGCGTGC<sup>U</sup>A  
TCCGCATGCTGGATCCTCTACTATTCTATGTTCTTCCCGAAAGCGTGC<sup>U</sup>A  
U<sup>U</sup>CTGCATGCTGGATC<sup>U</sup>TCTACTATTCTATGTTU<sup>U</sup>TTU<sup>U</sup>CGAAAGCGTGC<sup>U</sup>A  
TTCCGCATGCCGGATCCTTTACTATTTTCATGTTCTTCCCGAAAGCGTGC<sup>U</sup>A  
CTCGCATGCCGGATCCTTTACTATCTCATGTCTTTTCAAAGCGTGTCA  
CTCGCATGTCCGATTTTTTACTATTTTCATGTCTTTTCAAAGCGTGTCA  
TTTGCTCACTCGATCTTTTAAATTTTACGTTTTTCAAAGCGTATTA  
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Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
Arabidopsis thaliana  
Brassica napus  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
BPM24\_nad4  
RRII105\_nad4  
RRIC110\_nad4  
RRIT251\_nad4  
PB235\_nad4  
RRIM600\_nad4  
Oryza sativa Japonica  
Cycas taitungensis  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

ATCCCTATGTTC ---ATTATTATAGGGGTATGGGGTTCGAGACAAAGAAA  
ATCCCTATGTTC ---ATTATTATAGGGGTATGGGGTTCGAGACAAAGAAA  
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ATCCCTATGTTC ---ATTATTATAGGAGTATGGGGTTCGAGACAAAGAAA  
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ATTTCCATGTTT -----AGACAAAGAAA  
ATCCCATGTTT ---ATTATTATAGGTGTTTGGGGTTCGAGACAAAGGAA  
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Beta macrocarpa  
Beta vulgaris vulgaris

GATCAAGGCAGCATATCAGTTTTTCCTTTATACTTTACTTGGATCTGTT  
GATCAAGGCAGCATATCAGTTTTTCCTTTATACTTTACTTGGATCTGTT

*Silene latifolia*  
*Arabidopsis thaliana*  
*Brassica napus*  
*Citrullus lanatus*  
*Cucurbita pepo*  
*Lotus japonicus*  
*Millettia pinnata*  
BPM24\_nad4  
RRII105\_nad4  
RRIC110\_nad4  
RRIT251\_nad4  
PB235\_nad4  
RRIM600\_nad4  
*Oryza sativa* Japonica  
*Cycas taitungensis*  
*Megaceros aenigmaticus*  
*Phaeoceros laevis*  
*Pleurozia purpurea*

GATCAAGGCAGCATATCAGTTTTTCCTTTATACTTTACTTTGGATCTGTTT  
GATCAAGGCAGCATATCAGTTTTTCCTTTATACTTTACTTTGGATCTCTTT  
GATCAAGGCAGCATATCAGTTTTTCCTTTATACTTTACTTTGGATCTCTTT  
GATCAAGGCAGCATATCAGTTTTTCCTTTATACTTTACTTTGGGATCCGTTT  
GATCAAGGCAGCATATCAGTTTTTCCTTTATACTTTACTTTGGGATCTGTTT  
GATCAAGGCAGCATATCAGTTTTTCCTTTATACTTTACTTTGGATCTCTTT  
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AATACAAGCGGCATATCAGTTTTTCTTATATACTTTACTTTGGATCTGTGT  
AATACAAGCGGCATATCAGTTCTTTCTTATATACTTTACTTTGGATTTGTCT  
AATCAAAGCAGCATATCAGTTCTTTCTTGTACACCTTGATGGGATCCTTGT  
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*Beta macrocarpa*  
*Beta vulgaris* vulgaris  
*Silene latifolia*  
*Arabidopsis thaliana*  
*Brassica napus*  
*Citrullus lanatus*  
*Cucurbita pepo*  
*Lotus japonicus*  
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BPM24\_nad4  
RRII105\_nad4  
RRIC110\_nad4  
RRIT251\_nad4  
PB235\_nad4  
RRIM600\_nad4  
*Oryza sativa* Japonica  
*Cycas taitungensis*  
*Megaceros aenigmaticus*  
*Phaeoceros laevis*  
*Pleurozia purpurea*

TTATGCTATTAGCTATTCTGTTGATTCTTCTCAAACAGGAACCACCGAT  
TTATGCTATTAGCTATTCTGTTGATTCTTCTCAAACAGGAACCACCGAT  
TTATGCTATTAGCTATTCTGTTGATTCTTCTCAAACAGGAACCACCGAT  
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TTATGCTTTTAGCCATTTCTATCTATTTCTTCTCAAACAGGAACACTGTGAT  
TCATGCTCTTAGCCATTTATTTATTTTCTCAAACAGGAACCACTGTGAT  
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*Beta macrocarpa*  
*Beta vulgaris* vulgaris  
*Silene latifolia*  
*Arabidopsis thaliana*  
*Brassica napus*  
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BPM24\_nad4  
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PB235\_nad4  
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*Oryza sativa* Japonica  
*Cycas taitungensis*  
*Megaceros aenigmaticus*  
*Phaeoceros laevis*  
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TTACAAATCTTATTAACCACAGAATTTAGTGAGCGGCGCCAAATCTTTTT  
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TTACGAATATTATTAACCACAGAATCTAGTGAGTGGCGCCAAAGTTTTGCT  
CTACAAATATTACTAACCACAGAATTTAGTGAGCGGCGCCAAATCTTGCT









Millettia pinnata  
 BPM24\_nad4  
 RRII105\_nad4  
 RRIC110\_nad4  
 RRIT251\_nad4  
 PB235\_nad4  
 RRIM600\_nad4  
 Oryza sativa Japonica  
 Cycas taitungensis  
 Megaceros aenigmaticus  
 Phaeoceros laevis  
 Pleurozia purpurea

CTATGTGTTGGTGTCTATATGACCGACATAAGACTCGACTTGTTAGATA  
 CTATGTGTTGGTGTCTATATGACCGACATAAGACTCGACTTGTTAGATA  
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 CTATGTGTTGGTGTCTATATGACCGACATAAGACTCGACTTGTTAGATA  
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 TTATGTGTTGGTGCCTATATGACAGACATAAGACTCGACTTGTTAAATA  
 TTATGTGTTGGGGCTATACGACCGACACAAGACAAGAATTGTTAAATA  
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Beta macrocarpa  
 Beta vulgaris vulgaris  
 Silene latifolia  
 Arabidopsis thaliana  
 Brassica napus  
 Citrullus lanatus  
 Cucurbita pepo  
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 RRIM600\_nad4  
 Oryza sativa Japonica  
 Cycas taitungensis  
 Megaceros aenigmaticus  
 Phaeoceros laevis  
 Pleurozia purpurea

TTAUGGAGGTTTAGTGAGCACCATGCCGAATTTCTCTACCATTTTCTTCT  
 TTAUGGAGGTTTAGTGAGCACCATGCCGAATTTCTCTACCATTTTCTTCT  
 TTATGGGGGTTTAGTGAGCACCATGCCGAATTTCTCTACCATTTTCTTCT  
 TTAUGGAGGTTTAGTGAGCACCATGCCGAATU TCTCTACCATTTTCTTTT  
 TTAUGGAGGTTTAGTGAGCACCATGCCGAATU TCTCTACCATTTTCTTTT  
 TTAUGGAGGTTTAGTGAGCACCATGCCGAATU TCTCTACCATTTU CTCT  
 TTAUGGAGGTTTAGTGAGCACCATGCCGAATU TCTCTACCATTTU CTCT  
 TTAUGGAGGTTTAGTGAGCACCATGCCGAATU TCTCTACCATTTCTTCT  
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 TTACGGAGGTTTAGTGAGCACCATGCCGAATU TCTCTACCATTTTCTTCT  
 TTAUGGAGGTTTAGTGAGCACCATGCCGAATU TCTCTACCATTTTCTTCT  
 TTACGGAGGTTTAGTGAGCACCATGCCGAATU TCTCTACCATTTTCTTCT  
 TTAUGGAGGTTTAGTGAGCACCATGCCGAATU TCTCTACCATTTTCTTCT  
 TTAUGGAGGTTTAGTGAGCACCATGCCGAATU TCTCTACCATTTTCTTCT  
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 TTATGGAGGTTTAGTCAGCACCATGCCTATTTTCTCTACCATTTTCTTAT  
 \*\*\* \*\* \* \* \* \* \*\*\*\*\* \* \* \* \* \* \*\*\*\*\* \*\*\* \*

Beta macrocarpa  
 Beta vulgaris vulgaris  
 Silene latifolia  
 Arabidopsis thaliana  
 Brassica napus  
 Citrullus lanatus  
 Cucurbita pepo  
 Lotus japonicus  
 Millettia pinnata  
 BPM24\_nad4  
 RRII105\_nad4  
 RRIC110\_nad4  
 RRIT251\_nad4  
 PB235\_nad4  
 RRIM600\_nad4  
 Oryza sativa Japonica  
 Cycas taitungensis  
 Megaceros aenigmaticus  
 Phaeoceros laevis  
 Pleurozia purpurea

TTTTCACTTTAGCCAATATGAGTTTACCTGGTACTAGCAGCTTTATCGGG  
 TTTTCACTTTAGCCAATATGAGTTTACCTGGTACTAGCAGCTTTATCGGG  
 TTTTCACTTTAGCCAATATGAGTTTACCTGGTACTAGCAGCTTTATCGGG  
 CTTTACTTTGGCCAATATGAGTTU ACCTGGTACTAGCAGCTTTATCGGG  
 U TTTTACTTTGGCCAATATGAGTTU ACCTGGTACTAGCAGCTTTATCGGG  
 U TTTTACTTTGGCCAATATGAGTTTACCTGGTACTAGCAGCTTTATCGGG  
 U TTTTACTTTGGCCAATATGAGTTTACCTGGTACTAGCAGCTTTATCGGG  
 U TTTTACTTTGGCCAATATGAGTTU ACCTGGTACTAGCAGCTTTATCGGG  
 U TTTTACTTTGGCCAATATGAGTTU ACCTGGTACTAGCAGCTTTATCGGG  
 CTTTACTTTGGCCAATATGAGTTU ACCTGGTACTAGCAGCTTTATTGGG  
 CTTTACTTTGGCCAATATGAGTTU ACCTGGTACTAGCAGCTTTATTGGG  
 CTTTACTTTGGCCAATATGAGTTNACCTGGTACTAGCAGCTTTATTGGG  
 CTTTACTTTGGCCAATATGAGTTNACCTGGTACTAGCAGCTTTATTGGG  
 CTTTACTTTGGCCAATATGAGTTNACCTGGTACTAGCAGCTTTATTGGG  
 CTTTACTTTGGCCAATATGAGTTNACCTGGTACTAGCAGCTTTATTGGG  
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 TTTTCACTTTAGCCAATATGAGTTTACCCGGTACTAGCAGCTTTATCGGG  
 TTTTCACTTTAGCCAATATGAGTTTATTGGGTAGTAGCAGCTTTATCGGG  
 TTTTACCTAGCCAATATGAGTTTACCCGGTACTAGCAGCTTTATCGGG  
 \*\* \*\* \* \* \* \*\*\*\*\* \*\* \* \* \* \*\*\*\*\* \*\*\* \*\*

Beta macrocarpa  
 Beta vulgaris vulgaris  
 Silene latifolia  
 Arabidopsis thaliana

GAATTTCTCATCTTAGTAGGAGCTTTCCAAAGAAATAGCTTAGTAGCCAC  
 GAATTTCTCATCTTAGTAGGAGCTTTCCAAAGAAATAGCTTAGTAGCCAC  
 GAATTTCTCATCTTAGTAGGAGCTTTCCAAAGAAATAGCTTAGTAGCCAC  
 GAATTTCTCATCTTAGTAGGAGCTTTCCAAAGAAATAGCTTAGTAGCCAC





Phaeoceros laevis  
Pleurozia purpurea

CTTGTGTGAGTAACTTAGTGCAACATGGAAAATTTGATTAA  
CTTCCGTGAGTAACTTAGTGCAACATGGAAAATTTGATTAA  
\* \*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\* \*

#####

**nad5 multiple sequence alignment**

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
RRIC110\_nad5  
PB235\_nad5  
RRIT251\_nad5  
RRIM600\_nad5  
RRII105\_nad5  
BPM24\_nad5  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Brassica napus  
Megaceros aenigmaticus  
Phaeoceros laevis

ATGTATTTACTTATCGTCTTTTTGCCCTTGCTTGGTAGTCCCGTAGCAGG  
ATGTATTTACTTATCGTCTTTTTGCCCTTGCTTGGTAGTCCCGTAGCAGG  
ATGTATTTACTAATAGTCTTTTTGCCCTTGCTTGGTAGTCCCGTAGCAGG  
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ATGTATCTACTTATCGTATTTTTGCCCTTGCTCGGTAGTCCATAGCAGG  
ATGTATCTACTTATCGTATTTTTGCCCTTGCTCGGTAGTCCATAGCAGG  
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ATGTATCTACTTATCGTATTTTTGCCCTTGCTCGGTAGTCCCGTAGCAGG  
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ATGTATCTACTTATCGTATTTTTACCCCTTGCTCGGTAGTCCCGTAGCAGG  
ATGTATTTACTAATCGTCACTTTACCTTTGCCAGGTAGTTTCGTAGCAGG  
ATGTATTTACTAATCGTAACTTTACTTTTTGCCAGGTAGTTTTGTAGCAGG  
\*\*\*\*\* \* \*\* \* \*\* \* \*\* \* \* \*\*\*\*\* \* \*\* \*

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
RRIC110\_nad5  
PB235\_nad5  
RRIT251\_nad5  
RRIM600\_nad5  
RRII105\_nad5  
BPM24\_nad5  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Brassica napus  
Megaceros aenigmaticus  
Phaeoceros laevis

TTTTTTTCGGACGTTTTCTAGGATCAGAAGGAACTGCTATAGTGACTACTA  
TTTTTTTCGGACGTTTTCTAGGATCAGAAGGAACTGCTATAGTGACTACTA  
TTTTTTTCGGACGTTTTCTAGGATCAGAAGGAACTGCTATAGTGACTACTA  
TTTTTTTCGGACGTTTTCTAGGATCAGAAGGAACTGCTATAATGACCACTA  
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TTTTTTTCGGACGTTTTCTAGGATCAGAAGGAACTGCTATAATGACCACTA  
TTTTTTTCGGACGTTTTCTAGGATCAGAAGGAACTGCTATAATGACCACTA  
TTTTTTTCGGACGTTTTCTAGGATCAGAAGGAACTGCTATAATGACCACTA  
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TTTTTTTCGGACGTTTTCTAGGATCAGAAGGAACTGCTATAATGACCACTA  
TTTTTTTCGGACGTTTTCTAGGATCAGAAGGAACTGCTATAATGACCACTA  
TGCCTTTGGTCGTTTTCTGGTTCACGAGGAACTGCTACAATCACAACTA  
TGCTTTTGGTCGTTTTCTGGTTCACGAGGAACTGCTACAATCACAACTA  
\* \*\* \* \*\* \*\*\*\*\* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \*

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
RRIC110\_nad5  
PB235\_nad5  
RRIT251\_nad5  
RRIM600\_nad5  
RRII105\_nad5  
BPM24\_nad5  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Brassica napus  
Megaceros aenigmaticus  
Phaeoceros laevis

CGTGCGTTTTATTCTCTTCGATCTTATCTTTGATTGCTTTTTATGAAGTC  
CGTGCGTTTTATTCTCTTCGATCTTATCTTTGATTGCTTTTTATGAAGTC  
CGTGCGTTTTATTCTCTTCGATCTTATCTTTGATTGCTTTTTATGAAGTC  
CGTGCGTTTTATTCTCTTCGATCTTATCTTTGATTGCTTTTTATGAAGTC  
CGTGCGTTTTATTCTCTTCGATCTTATCTTTGATTGCTTTTTATGAAGTC  
CGTGCGTTTTATTCTCTTCGATCTTATCTTTGATTGCTTTTTATGAAGTC  
CGTGCGTTTTATTCTCTTCGATCTTATCTTTGATTGCTTTTTATGAAGTC  
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CGTGCGTTTTATTCTCTTCGATCTTATCTTTGATTGCTTTTTATGAAGTC  
TGTGTGTCTCATTATCTTGATTTTTCCCTTTGATTGCCTTTTTATGAAGTT  
TGTGTGTCTCATTATGTTCTATTTTTCTTTTGGATTGCCTTTTTATGAAGTT  
\*\*\* \*\* \*\*\*\*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \*

Beta macrocarpa  
Beta vulgaris vulgaris

GCACU|GGGAGCTAGTGCTTGCTATCTAAGAAATTGCTCCATGGATTTTCATC  
GCACU|GGGAGCTAGTGCTTGCTATCTAAGAAATTGCTCCATGGATTTTCATC









BPM24\_nad5  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Brassica napus  
Megaceros aenigmaticus  
Phaeoceros laevis

ATTGAATGCCATAACTCTTATTTGTATTTTACTTCTTATTGGTGCTGTTG  
ATTGAATGCCATAACTCTGATTTGTATTTTACTTUUTTATTGGTGCTGTTG  
ATTGAATGCCATAACTCTGATTTGTATTTTACTTUUTTATTGGTGCTGTTG  
ATTGAATGCCATAACTCTGATTTGTATTTTACTTUUTTATTGGTGCTGTTG  
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ATTTAATGCCATAAGTCTTATTTGTATTTTACTTUUTTATTGGTGCTGTTG  
ATTTTCATGCTATAACTGTTATTTGTATTTTACCGCTCATTGGCGCTGTCG  
ATTTTCATGCTATAACTGTTATTTGTATTTTACTGTTTCATTGGCGCTGTTG  
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Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
RRIC110\_nad5  
PB235\_nad5  
RRIT251\_nad5  
RRIM600\_nad5  
RRII105\_nad5  
BPM24\_nad5  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Brassica napus  
Megaceros aenigmaticus  
Phaeoceros laevis

GAAATCTGCACAGATAGGATUGCATACTTGGTUACCCGATGCTATGGAG  
GAAATCTGCACAGATAGGATUGCATACTTGGTUACCCGATGCTATGGAG  
GAAATCTGCACAGATAGGATUGCATACTTGGTUACCCGATGCTATGGAG  
GGAAATCTGCACAGATAGGATUGCATACTTGGTUACCCGATGCTATGGAG  
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GGAAATCTGCACAGATAGGATUGCATACTTGGTUACCCGATGCTATGGAG  
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GAAATTTGCACAAATAGGATTGCATACTTGGTTACCCGACGTCATGGAG  
\* \*\*\*\* \* \* \*\*\*\*\* \* \* \*\*\*\*\* \* \* \*\*\*\*\* \* \* \*\*\*\*\* \*

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
RRIC110\_nad5  
PB235\_nad5  
RRIT251\_nad5  
RRIM600\_nad5  
RRII105\_nad5  
BPM24\_nad5  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Brassica napus  
Megaceros aenigmaticus  
Phaeoceros laevis

GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTATGGTAACAGC  
GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTATGGTAACAGC  
GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTATGGTAACAGC  
GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTATGGTAACGGC  
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GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTATGGTAACGGC  
GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTATGGTAACGGC  
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GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTATGGTAACAGC  
GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTATGGTAACAGC  
GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTATGGTACAGC  
GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTACGGTCACAGC  
GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTATGGTACAGC  
GGTCCCCTCCAGTATCCGCTTTGATTCATGCAGCTACTATGGTACAGC  
\*\* \*\*\*\*\* \* \* \*\*\*\*\* \* \* \*\*\*\*\* \* \* \*\*\*\*\* \*

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
RRIC110\_nad5  
PB235\_nad5  
RRIT251\_nad5  
RRIM600\_nad5  
RRII105\_nad5  
BPM24\_nad5  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Millettia pinnata  
Brassica napus  
Megaceros aenigmaticus  
Phaeoceros laevis

TGGCGTTTTCATGATAGCAAGGTGTTCCCTTTATTTGAATACUACCTA  
TGGCGTTTTCATGATAGCAAGGTGTTCCCTTTATTTGAATACUACCTA  
TGGCGTTTTCATGATAGCAAGGTGTTCCCTTTATTTGAATACUACCTA  
TGGCGTTTTCATGATAGCAAGGTGCTCCCTTTATTTGAATACTCACCTA  
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TGGCGTTTTCATGATAGCAAGGTGCTCCCTTTATTTGAATACTCACCTA  
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TGGCGTTTTCATGATAGCAAGGTGCTCCCTTTATTTGAATACTCACCTA  
AGGCGTTTTTATGATAGCGAGGTGCCCTCCCTTTATTTGAATACCCGCTA  
AGGCGTTTTTATGATAGCGAGGTGCCCTCCCTTTATTTGAATACCCGCTA





Megaceros aenigmaticus  
Phaeoceros laevis

TGATGCTTATAGGCAGCTTATCTCCAATCGGATTTCTTTTTTAACTGGA  
TGATGCTTATAGGCAGCTTATCTCCAATCGGATTTCTTTTTTAACTGGA  
\*\*\*\*\* \*\* \*\*\*\*\* \*\*

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
RRIC110\_nad5  
PB235\_nad5  
RRIT251\_nad5  
RRIM600\_nad5  
RRII105\_nad5  
BPM24\_nad5  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Milletia pinnata  
Brassica napus  
Megaceros aenigmaticus  
Phaeoceros laevis

TTTTATTCAAAGATGTGATCTTAGAGCTCGCTTACACTAAGTATACCAT  
TTTTATTCAAAGATGTGATCTTAGAGCTCGCTTACACTAAGTATACCAT  
TTTTATTCAAAGATGTGATCTTAGAGCTCGCTTACACTAAGTATACCAT  
TTTTATTCAAAGATGTGATCTTAGAGCTCGCTTACACTAAGTATACCAT  
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TTTTATTCAAAGATGTGATCTTAGAGCTCGCTTACACTAAGTATACCAT  
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TTTTATTCAAAGATGTGATCTTAGAGCTCGCTTACACTAAGTATACCAT  
TTTTATTCAAAGATGTGATCTTAGAGCTCGCTTACACTAAGTATACCAT  
TTTTATTCAAAGATGTGATCTTAGAGCTCGCTTACACTAAGTATACCAT  
TTTTATTCAAAGATGTGATCTTAGAGCTCGCTTACACTAAGTATACCAT  
TTTTATTCAAAGATGTGATTCTGGAGCTGCTTACACTAAATATACAAT  
TTTTATTCAAAGATGTGATTCTAGAGCTGCTTACACTAAATATACAAT  
\*\*\*\*\* \* \*\*\*\* \*\*\*\*\* \*\*

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
RRIC110\_nad5  
PB235\_nad5  
RRIT251\_nad5  
RRIM600\_nad5  
RRII105\_nad5  
BPM24\_nad5  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Milletia pinnata  
Brassica napus  
Megaceros aenigmaticus  
Phaeoceros laevis

CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
AAGTGGTAATTTTCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
AAGTGGTAATTTTCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
CAGTGGGAACCTTTGCTTTCTGGTTGGGAAGTATTTCTGTCCTTTTCACTT  
TAGTGGTAACCTCTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
TAGTGGTAACCTTTGCTTTCTGGTTGGGAAGTGTCTCTGTCCTTTTCACTT  
\*\*\*\*\* \*\* \* \*\*\*\*\* \* \*\*\*\*\* \* \*\*\*\*\*

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
RRIC110\_nad5  
PB235\_nad5  
RRIT251\_nad5  
RRIM600\_nad5  
RRII105\_nad5  
BPM24\_nad5  
Citrullus lanatus  
Cucurbita pepo  
Lotus japonicus  
Milletia pinnata  
Brassica napus  
Megaceros aenigmaticus  
Phaeoceros laevis

CTTATTACTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
CTTATTACTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
CTTATTACTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
CTTATTACTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
CTTATTACTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
CTTATTACTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
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CTTATTACTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
CTTATTACTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
CTTATTACTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
CTTATTACTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
CTTACCACCTTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
CTTACCACCTTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
CTTACCACCTTCTTTTCGTTTACTTTTTCTAACATTTCTAGTACCAACTAAT  
\*\*\*\* \* \*\* \*\*\*\*\* \* \*\* \* \*\*\*\*\* \*\* \*\*\*\*\* \*\*

Beta macrocarpa  
Beta vulgaris vulgaris  
Silene latifolia  
RRIC110\_nad5

TCATTCGGGCGAGACATCTTACGATGTCATGATGCGCCATTCCTATGGC  
TCATTCGGGCGAGACATCTTACGATGTCATGATGCGCCATTCCTATGGC  
TCATTCGGGCGAGACATCTTACGATGTCATGATGCGCCATTCCTATGGC  
TCATTCGGGCGAGACATCGTAAGATGTCATGATGCGCCATTCCTATGGC



Milletia pinnata -----  
Brassica napus -----  
Megaceros aenigmaticus TTCATATCACCCAAAAATGAGATTCTTGCTGAATCTGAGTTTGCTACTCC  
Phaeoceros laevis TTCATATCACCCAAAAATGAGATTCTTGCTGAATCTGAGTTTGCTACTCC

Beta macrocarpa -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
RRIC110\_nad5 AACCATTAUCAAACCTAATACCTATTCCGTTTAGTACTTCAGGTGCTTNTG  
PB235\_nad5 AACCATTAUCAAACCTAATACCTATTCCGTTTAGTACTTCAGGTGCTTNTG  
RRIT251\_nad5 AACCATTAUCAAACCTAATACCTATTCCGTTTAGTACTTCAGGTGCTTUTG  
RRIM600\_nad5 AACCATTAUCAAACCTAATACCTATTCCGTTTAGTACTTCAGGTGCTTNTG  
RRII105\_nad5 AACCATTAUCAAACCTAATACCTATTCCGTTTAGTACTTCAGGTGCTTUTG  
BPM24\_nad5 AACCATTAUCAAACCTAATACCTATTCCGTTTAGTACTTCAGGTGCTTUTG  
Citrullus lanatus -----  
Cucurbita pepo -----  
Lotus japonicus -----  
Milletia pinnata -----  
Brassica napus -----  
Megaceros aenigmaticus AACCATTATAAACTAATTCCTATCCTGTTTAGTACTTTAGGCGCATTTG  
Phaeoceros laevis AACCATTATCAAACCTAATTCCTATTCTGTTTAGTACTTTAGGCGCATTTG

Beta macrocarpa -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
RRIC110\_nad5 TTGCGTATAATGTAAATCU CGTAGCGGATCAATTCCAACAAGCCTTTCAA  
PB235\_nad5 TTGCGTATAATGTAAATCU CGTAGCGGATCAATTCCAACAAGCCTTTCAA  
RRIT251\_nad5 TTGCGTATAATGTAAATCU CGTAGCGGATCAATTCCAACAAGCCTTTCAA  
RRIM600\_nad5 TTGCGTATAATGTAAATCNCGTAGCGGATCAATTCCAACAAGCCTTTCAA  
RRII105\_nad5 TTGCGTATAATGTAAATCU CGTAGCGGATCAATTCCAACAAGCCTTTCAA  
BPM24\_nad5 TTGCGTATAATGTAAATCU CGTAGCGGATCAATTCCAACAAGCCTTTCAA  
Citrullus lanatus -----  
Cucurbita pepo -----  
Lotus japonicus -----  
Milletia pinnata -----  
Brassica napus -----  
Megaceros aenigmaticus TGGCGTATAATGTCAATTTTATAGCAAATGAATTTATCTTCGCTTTGAAA  
Phaeoceros laevis TGGCGTATAATGTAAATTTTATAGCAAATGAATTTATCTTCGCTTTGAAA

Beta macrocarpa -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
RRIC110\_nad5 ACTAGTACTTTTTGTAATCGACTCTATAGCTTCTTCAATAAACGCTGGTT  
PB235\_nad5 ACTAGTACTTTTTGTAATCGACTCTATAGCTTCTTCAATAAACGCTGGTT  
RRIT251\_nad5 ACTAGTACTTTTTGTAATCGACTCTATAGCTTCTTCAATAAACGCTGGTT  
RRIM600\_nad5 ACTAGTACTTTTTGTAATCGACTCTATAGCTTCTTCAATAAACGCTGGTT  
RRII105\_nad5 ACTAGTACTTTTTGTAATCGACTCTATAGCTTCTTCAATAAACGCTGGTT  
BPM24\_nad5 ACTAGTACTTTTTGTAATCGACTCTATAGCTTCTTCAATAAACGCTGGTT  
Citrullus lanatus -----  
Cucurbita pepo -----  
Lotus japonicus -----  
Milletia pinnata -----  
Brassica napus -----  
Megaceros aenigmaticus ACAACTTCTTTTGGAATGGACTATATTGCTTCTTAAATAAGCGTTGGTT  
Phaeoceros laevis ACAACCTCTTTTGGAATGGACTATATTGCTTCTTAAATAAGCGTTGGTT

Beta macrocarpa -----  
Beta vulgaris vulgaris -----





Cucurbita pepo -----  
Lotus japonicus -----  
Millettia pinnata -----  
Brassica napus -----  
Megaceros aenigmaticus TAAACTTCAAAGTGGATTTGTTTATCATTACGCTTTCGCTATGCTGATTG  
Phaeoceros laevis TAAACTTCAAAGTGGATTTGTTTATCATTACGCTTTCGCTAT-----

Beta macrocarpa -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
RRIC110\_nad5 GTTCAACTCTATTTGTGACCTTTTCTCGTATGTGGGACTCTCTATCTTCT  
PB235\_nad5 GTTCAACTCTATTTGTGACCTTTTCTCGTATGTGGGACTCTCTATCTTCT  
RRIT251\_nad5 GTTCAACTCTATTTGTGACCTTTTCTCGTATGTGGGACTCTCTATCTTCT  
RRIM600\_nad5 GTTCAACTCTATTTGTGACCTTTTCTCGTATGTGGGACTCTCTATCTTCT  
RRII105\_nad5 GTTCAACTCTATTTGTGACCTTTTCTCGTATGTGGGACTCTCTATCTTCT  
BPM24\_nad5 GTTCAACTCTATTTGTGACCTTTTCTCGTATGTGGGACTCTCTATCTTCT  
Citrullus lanatus -----  
Cucurbita pepo -----  
Lotus japonicus -----  
Millettia pinnata -----  
Brassica napus -----  
Megaceros aenigmaticus GTTTAACCATATTTATTACTATTATAGGTCTGTGGGATTTTCTCTCCTTT  
Phaeoceros laevis -----

Beta macrocarpa -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
RRIC110\_nad5 TGGGTAGATAAATCGATCGTCTTTTCATTTTGATAGTGAGTACTTTTTATAA  
PB235\_nad5 TGGGTAGATAAATCGATCGTCTTTTCATTTTGATAGTGAGTACTTTTTATAA  
RRIT251\_nad5 TGGGTAGATAAATCGATCGTCTTTTCATTTTGATAGTGAGTACTTTTTATAA  
RRIM600\_nad5 TGGGTAGATAAATCGATCGTCTTTTCATTTTGATAGTGAGTACTTTTTATAA  
RRII105\_nad5 TGGGTAGATAAATCGATCGTCTTTTCATTTTGATAGTGAGTACTTTTTATAA  
BPM24\_nad5 TGGGTAGATAAATCGATCGTCTTTTCATTTTGATAGTGAGTACTTTTTATAA  
Citrullus lanatus -----  
Cucurbita pepo -----  
Lotus japonicus -----  
Millettia pinnata -----  
Brassica napus -----  
Megaceros aenigmaticus TGGGTAGATAAATAGATTGTATTTTATTACACAGTGACTTTTCTTTTTAT  
Phaeoceros laevis -----

Beta macrocarpa -----  
Beta vulgaris vulgaris -----  
Silene latifolia -----  
RRIC110\_nad5 TAATAAGTTAAGTCAAGAATAA-----  
PB235\_nad5 TAATAAGTTAAGTCAAGAATAA-----  
RRIT251\_nad5 TAATAAGTTAAGTCAAGAATAA-----  
RRIM600\_nad5 TAATAAGTTAAGTCAAGAATAA-----  
RRII105\_nad5 TAATAAGTTAAGTCAAGAATAA-----  
BPM24\_nad5 TAATAAGTTAAGTCAAGAATAA-----  
Citrullus lanatus -----  
Cucurbita pepo -----  
Lotus japonicus -----  
Millettia pinnata -----  
Brassica napus -----  
Megaceros aenigmaticus TAATCTTGAGGGAGACATTCGCACAAATTA  
Phaeoceros laevis -----

#####

**nad6 multiple sequence alignment**

```
Arabidopsis thaliana      --TAGGAACAACCGCGCTGGTU----GTAATAGATCGACTTTTCATGCTGA
Brassica napus           AATAGGAACAACCGCGCTGGTC----GTAATAGATCGACTTTTCATGCTGA
RRII105_nad6             -----
Beta macrocarpa          -----CAACCGCGCTGGTCGTACGTAATAGATCGACTTTTCATGCTAG
Beta vulgaris maritima   -----CAACCGCGCTGGTCGTACGTAATAGATCGACTTTTCATGCTAG
Beta vulgaris vulgaris   -----CAACCGCGCTGGTCGTACGTAATAGATCGACTTTTCATGCTAG
Silene latifolia        -----CAACCGCGCTGGTCGTACGTAATAGATCGACTTTTCATGCTAG
Oryza sativa Japonica    -ATACGAACAACCGCGCTGGTC---GTAATAGATCGACTTGAATGCGTC
RRI110_nad6              -----
Millettia pinnata       -----CTGTTGGTCA---ACAACCAAGCACAGCTCTATATAG
BPM24_nad6               -----
Lotus japonicus          -----CCGCGCTGGTCG----TAATAGATCGACTTTTCATGCTAG
PB235_nad6               -----
RRIT251_nad6            -----
RRIM600_nad6            -----
Cycas taitungensis      -----ACAACCGGGACCGCTGGTCGTACGTAATAGATCAACTCGAATGCCAG
Zea mays mays           -----CCAATATTTATCTTTTGTGGAAAAACCAACCCACATATTGA
Megaceros aenigmaticus  -----
Phaeoceros laevis       -----
Pleurozia purpurea      -----TTGAAAAATTCGCTTTCTGCCGA
```

```
Arabidopsis thaliana      AGCAAGA-ACTAG-----CATGAAAGTTCC----ATTCAGGGAAGGACG
Brassica napus           AGCAAGA-ACTAG-----CATGAAAGTTCC----ATTCAGGGAAGGACG
RRII105_nad6             -----
Beta macrocarpa          TTCTTAC-TCCAAACCAGCATGAAAGTTCC----ATTCAGTGAAGGACG
Beta vulgaris maritima   TTCTTAC-TCCAAACCAGCATGAAAGTTCC----ATTCAGTGAAGGACG
Beta vulgaris vulgaris   TTCTTAC-TCCAAACCAGCATGAAAGTTCC----ATTCAGTGAAGGACG
Silene latifolia        TTCTTGC-TCCAAACCAGCATGAAAGTTCC----ATTCAGTGAAGGACG
Oryza sativa Japonica    TTCTTGC-TCCAA-----CATTCAAGTTCC----ATTCAGGGAAGGACG
RRI110_nad6              -----
Millettia pinnata       TCAAAAC-ACTAGT----CCTACAGGCTTTTCGGAGTTCAGTCGGAATCA
BPM24_nad6               -----
Lotus japonicus          TTCTTGC-TCCAG-----CATGAAAGTTCC----ATTCAGGGAAGGCTT
PB235_nad6               -----
RRIT251_nad6            -----
RRIM600_nad6            -----
Cycas taitungensis      TTCTTGC-TCCAG-----CATGAAAGTGAC----ATTTTGGGGAAGGACG
Zea mays mays           TCTTTAAGTCTCCCTTTCTTTTGGGAGCAGATCTTCAAAGATGGGAA
Megaceros aenigmaticus  -----
Phaeoceros laevis       -----
Pleurozia purpurea      CGCGGTTTCGAGCAAAAATATAGATTTTTTGTTCACAGCTAATAAAATAA
```

```
Arabidopsis thaliana      ACGGTA-----CCATGATACTTTCT---GTTTTGTGCGAGCCUTGCT
Brassica napus           ACGTAC-----CCATGATACTTTCT---GTTTTGTGCGAGCCUTGCT
RRII105_nad6             -----ATGATACTTTCT---GTTTTGTGCGAGCCUTGCT
Beta macrocarpa          ACGTA-----CCATGATACTTTCT---GTTTTGTGCGAGCCUGGCT
Beta vulgaris maritima   ACGTA-----CCATGATACTTTCT---GTTTTGTGCGAGCCUGGCT
Beta vulgaris vulgaris   ACGTA-----CCATGATACTTTCT---GTTTTGTGCGAGCCUGGCT
Silene latifolia        ACGTA-----CCATGATACTTTCT---GTTTTGTGCGAGCCUAGCT
Oryza sativa Japonica    ACGTA-----CCATGATACTTTCA---GTTTTGTCTAGCUUTGCT
RRI110_nad6              -----ATGATACTTTCT---GTTTTGTGCGAGCCUTGCT
Millettia pinnata       TTTCTTCTCAA--TGCCATGATACTTTCT---GTTTTGTGCGAGCCUTGCT
BPM24_nad6               -----ATGATACTTTCT---GTTTTGTGCGAGCCUTGCT
Lotus japonicus          TTTGGACTAAGGGTACCATGATACTTTCT---GTTTTGTGCGAGCCUTGCT
PB235_nad6               -----ATGATACTTTCT---GTTTTGTGCGAGCCUTGCT
RRIT251_nad6            -----ATGATACTTTCT---GTTTTGTGCGAGCCNTGCT
RRIM600_nad6            -----ATGATACTTTCT---GTTTTGTGCGAGCCNTGCT
Cycas taitungensis      ACGTA-----CTAUGATACTTTCT---GTTTCGTCGAGCCCTGCT
```

Zea mays mays  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

ATTC-----CAATGATTCTTTCC---GTTTTGTGCGAGCUUUGCT  
-----ATGATACTTTTTTCTGTTCCCTTCGAGCATTGCT  
-----ATGATACTTTTTTCTGTTCCCTTCGAGCATTGCT  
AAGGGGAAAATTTACCAUGATACTTTTTTATGTTTTGTGGTCTCGCT  
\* \*\*\* \*\*\*\*\* \*\* \* \*\*

Arabidopsis thaliana  
Brassica napus  
RRII105\_nad6  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
RRIC110\_nad6  
Millettia pinnata  
BPM24\_nad6  
Lotus japonicus  
PB235\_nad6  
RRIT251\_nad6  
RRIM600\_nad6  
Cycas taitungensis  
Zea mays mays  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

TTGGTCTCTGGTTTGATGGTTGUACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGUACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGCACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGTACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGTACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGTACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGCACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGUACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGCACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGUACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGCACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGCACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCTCTGGTTTGATGGTTGCACGTGCTAAAAATCCGGTACATTCCGT  
TTGGTCCCTGGTTTGATGGTTGTACGTGCTGAAAAATCCAGTACATCCCCT  
TTGGTCTCTGGTTTGATGGTTGTACGTGCTAAAAATCCGGTACATTCCGT  
TTAGTCTCCGGTGTACGGCGACACGTGCCAAAAATCCAGTCCATTCCGT  
TTAGTCTCCGGTGTACGGCGACACGTGCCAAAAATCTAGTCCATTCCGT  
TTAGTGTCAGGCGCTATGGTGATACGTGCCAAAAATCCAGTTCATTCTGT  
\*\* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\*

Arabidopsis thaliana  
Brassica napus  
RRII105\_nad6  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
RRIC110\_nad6  
Millettia pinnata  
BPM24\_nad6  
Lotus japonicus  
PB235\_nad6  
RRIT251\_nad6  
RRIM600\_nad6  
Cycas taitungensis  
Zea mays mays  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

TTTGTTTUUUCATCCUAGTCTTTU GCGACACTTCAGGTTTACTTCTTTTGT  
TTTGTTTUUUCATCCUAGTCTTTU GCGACACTTCAGGTTTACTTCTTTTGT  
TTTGTTTCCCATCCTAGTCTTTTCGCGATACTTCAGGTTTACTTCTTTTGT  
TTTGTTTUUUATCUUAGTCTTTU GCAACACTTCAGGTTTACTTCTTTTGT  
TTTGTTTUUUATCUUAGTCTTTU GCAACACTTCAGGTTTACTTCTTTTGT  
TTTGTTTUUUATCUUAGTCTTTU GCAACACTTCAGGTTTACTTCTTTTGT  
TTTGTTTUUUATCUUAGTCTTTU GCAACACTTCAGGTTTACTTCTTTTGT  
TTTGTTTUUUCATCCTAATCTTTT GCGACACAGCTGGTTTACTTATTTTGT  
TTTGTTTCCCATCCTAGTCTTTTCGCGATACTTCAGGTTTACTTCTTTTGT  
TTTGTTTUUUCATCCUAGTCTTTU GCGACACTTCAGGTTTACTTCTTTTGT  
TTTGTTTCCCATCCTAGTCTTTTCGCGATACTTCAGGTTTACTTCTTTTGT  
TTTGTTTUUUCATCCUAGTCTTTU GCGACACTTCAGGTTTACTTCTTTTGT  
TTTGTTTCCCATCCTAGTCTTTTCGCGATACTTCAGGTTTACTTCTTTTGT  
TTTGTTTUUUCATCCTAGTCTTTT GCGACACTTCAGGTTTACTTATTTTGT  
TTTATTTTCAATACCCGCTTTTCGCAACACTTCAGGTTTACTTGTTTTGC  
TTTATTTTAAATACCCGCTTTTCGCAATACTTCAGGTTTACTTGTTTTGT  
TTTATTTTAAATCTCAGTTTTTTCGCAATACTTCGGTTTACTCGTTTTGT  
\*\* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\*

Arabidopsis thaliana  
Brassica napus  
RRII105\_nad6  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
RRIC110\_nad6  
Millettia pinnata  
BPM24\_nad6  
Lotus japonicus

TAGGTCTCGACTTCTTCGCTATGATCTTCCUAGTAGTTUATATAGGAGCT  
TAGGTCTCGACTTCTTCGCTATGATCTTCCUAGTAGTTUATATAGGAGCT  
TAGGTCTCGACTTCTUCGCTATGATCTTCCUAGTAGTTTATATAGGAGCT  
TAGGTCTCGATTTTTUCGCTATGATCTTCCUAGTAGTTTATATAGGAGCT  
TAGGTCTCGATTTTTUCGCTATGATCTTCCUAGTAGTTTATATAGGAGCT  
TAGGTCTCGATTTTTUCGCTATGATCTTCCUAGTAGTTTATATAGGAGCT  
TAGGTCTCGACTTTTUCGCTATGATCTTCTTAGTAGTTTATATAGGAGCT  
TAGGTCTCGACTTCTUCGCTATGATCTUUUCUAGTAATTUATATAGGAGCT  
TAGGTCTCGACTTCTUCGCTATGATCTTCCUAGTAGTTTATATAGGAGCT  
TAGGTCTCGACTTCTUCGCTATGATCTTCCUAGTAGTTTATATAGGAGCT  
TAGGTCTCGACTTCTUCGCTATGATCTTCCUAGTAGTTTATATAGGAGCT  
TAGGTCTCGACTTCTUCGCTATGATCTTCCUAGTAGTTUATATAGGAGCT



RRIC110\_nad6  
Millettia pinnata  
BPM24\_nad6  
Lotus japonicus  
PB235\_nad6  
RRIT251\_nad6  
RRIM600\_nad6  
Cycas taitungensis  
Zea mays mays  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

GACTGATCCTTTGGTGGGAAATGTTCTTCATTTTAGATAATGAAACCATT  
GACTGATCUTTTGGTGGGAAATGTTCTTCATTTTAGATAATGAAACCATT  
GACTGATCCTTTGGTGGGAAATGTTCTTCATTTTAGATAATGAAACCATT  
GACTGATCUTTTGGTGGGAAATGTTCTTCATTTTAGATAATGAAACCATT  
GACTGATCCTTTGGTGGGAAATGTTCTTCATTTTAGATAATGAAACCATT  
GACTGATCCTTTGGTGGGAAATGTTCTTCATTTTAGATAATGAAACCATT  
GACTGATCCTTTGGTGGGAAATGTTCTTCATTTTAGATAATGAAACCATT  
GACCGATCCTTCGGTGGGAAATGTTCTTCATCTAGATAATGATCACATT  
GACTGATCCTTTGGTGGGAAATGTTCTTCATTTTAGATAATGAAACCATT  
GACTTATTCCTTTGTTGGAAATATTTTTTCATCGTAGATAATGATTACATT  
GACTTATTCCTTTGCTGGAAATCTTTTTTATTGTAGATAATGATTACATT  
GACTTATTTTTTTGTTGGAAATCTTTCTAATGGTAGATAATGATTACATC  
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Arabidopsis thaliana  
Brassica napus  
RRII105\_nad6  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
RRIC110\_nad6  
Millettia pinnata  
BPM24\_nad6  
Lotus japonicus  
PB235\_nad6  
RRIT251\_nad6  
RRIM600\_nad6  
Cycas taitungensis  
Zea mays mays  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

CCATTACTACCAACCCAAAGAAATACGACCTCTCTTAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTTAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACAGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACGGTTTA  
CCATTACTACCAACCCAAAGAAATACGACCTCTCTGAGATATACGGTTTA  
CCATCATTACCGACCTACATAGGTACAACCTCTCTGAGATATACAGTTCA  
CCATTACTACCAACCCACAGAAATACGACCTCTCTGAAATATACGGTTTA  
CCAATATTACCAACGAAACTGAGTACAACCTATCTAACATATACAGTTTA  
CCAATATTACCAACGAAACTGAGTACAGCCTATCTAACATATACAGTTTA  
CCAATATTATCAACGAAATCGGGTGCAACCTATCTAACATATACAGTTTA  
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Arabidopsis thaliana  
Brassica napus  
RRII105\_nad6  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
RRIC110\_nad6  
Millettia pinnata  
BPM24\_nad6  
Lotus japonicus  
PB235\_nad6  
RRIT251\_nad6  
RRIM600\_nad6  
Cycas taitungensis  
Zea mays mays  
Megaceros aenigmaticus  
Phaeoceros laevis  
Pleurozia purpurea

TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCTGGAGAGATACAAAGTTGGACTAATTCGGAAACATTGGGCAATTTAC  
TGCCGAAAGGTACGAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCTGGAAAGATACAAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCTGGAAAGATACAAAGTTGGACTAATTTGGAAACATTGGGCAATTTAC  
TGCTGGAAAGATACATAGTTGGACTAATTCGGAGACATTAGGCAATTTAC  
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Arabidopsis thaliana  
Brassica napus  
RRII105\_nad6  
Beta macrocarpa

TTTATACCTACTATTUTGTCTGGTTTTTGGTTCTTAGTCTTATTTTATTA  
TTTATACCTACTATTUTGTCTGGTTTTTGGTTUCTAGTCTTATTTTATTA  
TTTATACCTACTATTTTCGTCTGGTTTTTGGTTUCTAGTCTTATTTTATTA  
TTTATACTTACTATTTTGTCTGGTTTTTGGTTTCTAGTCTTATTTTATTA



Arabidopsis thaliana ----TAATGAGGAGGACGACTGACCCACTCACGATCTACTAAAGGGCAAG  
 Brassica napus ----TAATGAGGAGGACGACTGACCCACTCACGATCTACTAAAGGGCAAG  
 RRII105\_nad6 ----TAATGAGGAGGACGACAGACCCACTCACGATCTACTAA-----  
 Beta macrocarpa ----TAATGAAGAGGACGACAGACCCACTCACGATCTACTAAAGGTATCG  
 Beta vulgaris maritima ----TAATGAAGAGGACGACAGACCCACTCACGATCTACTAAAGGTATCG  
 Beta vulgaris vulgaris ----TAATGAAGAGGACGACAGACCCACTCACGATCTACTAAAGGTATCG  
 Silene latifolia ----TAATGAGGAGGACGACAGACCCACTCACGATCTACTAAAGGTATCG  
 Oryza sativa Japonica ----TAATGAGGAGGACGACAGACCAAATU<sup>U</sup>TCGATU<sup>U</sup>ACTAAAAG----G  
 RRIC110\_nad6 ----TAATGAGGAGGACGACAGACCCACTCACGATCTACTAA-----  
 Millettia pinnata ----TAATGAGGCGGACGACAGACCCACTCACGATCGACTAAAAGGAAAG  
 BPM24\_nad6 ----TAATGAGGAGGACGACAGACCCACTCACGATCTACTAA-----  
 Lotus japonicus ----TAATGAGGCGGACGACAGACCCACTCACGATCGACTAAAAGGAAAG  
 PB235\_nad6 ----TAATGAGGAGGACGACAGACCCACTCACGATCTACTAA-----  
 RRIT251\_nad6 ----TAATGAGGAGGACGACAGACCCACTCACGATCTACTAA-----  
 RRIM600\_nad6 ----TAATGAGGAGGACGACAGACCCACTCACGATCTACTAA-----  
 Cycas taitungensis ----TAATGAGGAGGACGACGGACCAA<sup>U</sup>---AAGTTGATCGCGGGCGGAG  
 Zea mays mays CTATTCATATTCAGAACAGAAGGTTCTTCTCCACAAAGGGGATGACGCA  
 Megaceros aenigmaticus ----TAA-AAAAAATCAGAAAGATCTGA-----  
 Phaeoceros laevis ----TAA-AAAAAATCAGAAAGATCTGA-----  
 Pleurozia purpurea ----TCA-GAAAAGTTCGTTGAAAATGCTGTCAATTCGTTTTTTGGTAA  
 \* \*

Arabidopsis thaliana TAGCTTG----ATTGGTTCG-----AATCCAATTCGTGAGCAGA  
 Brassica napus TAGCTTG----ATTGGTTCG-----AATCCAATTCGCGAGCAGA  
 RRII105\_nad6 -----  
 Beta macrocarpa GAGATTG----ATTGGTTCG-----AATCCAATTCGTGAGATGG  
 Beta vulgaris maritima GAGATTG----ATTGGTTCG-----AATCCAATTCGTGAGATGG  
 Beta vulgaris vulgaris GAGATTG----ATTGGTTCG-----AATCCAATTCGTGAGATGG  
 Silene latifolia GAGATTG----ATTGGTTCG-----AATCCAATTCGTGAGATGG  
 Oryza sativa Japonica AGAATTG-----TGGTTCG-----AGTCCACGTCGTGAGATGG  
 RRIC110\_nad6 -----  
 Millettia pinnata TCGCCCGGAGATATTGGTTCA-----AATCCAATTCGTGAGAAGA  
 BPM24\_nad6 -----  
 Lotus japonicus TCGCCCGGAGATATTGGTTCA-----AATCCAATTCGTGAGAAGA  
 PB235\_nad6 -----  
 RRIT251\_nad6 -----  
 RRIM600\_nad6 -----  
 Cycas taitungensis ACGGGGGA---ACCA--CCG-----GGCCAG--CAACGGCTGC  
 Zea mays mays CCTGTCCCCCGCTGATCCGGAATCCATTTAATCTGATTTGGCAGAGAG  
 Megaceros aenigmaticus -----  
 Phaeoceros laevis -----  
 Pleurozia purpurea ACATAATGG--TATCGATTAGAATTTGAATGAGGTTGTCTGGAACCTCGG

Arabidopsis thaliana TGAGAAATTGTTGCAC----CGTGACTCTGATTTCAGTAGCGGCAGCAA  
 Brassica napus TGAGAAATTGTTGCAC----CGTGACTCTGATTTCAGTAGCGGCAGCAA  
 RRII105\_nad6 -----  
 Beta macrocarpa C-AGTGATCTTTAGCT-GGTCATGGCCATTAAAC----CTTTTTAAGGGC  
 Beta vulgaris maritima C-AGTGATCTTTAGCT-GGTCATGGCCATTAAAC----CTTTTTAAGGGC  
 Beta vulgaris vulgaris C-AGTGATCTTTAGCT-GGTCATGGCCATTAAAC----CTTTTTAAGGGC  
 Silene latifolia C-AGTGATCTTTAGCT-GGTCATGGCCATTAAAC----CTTTTTAAGGGC  
 Oryza sativa Japonica CCAGTGATCTTTAGCTTGGTCATGGCCATAATGTGCTTTTTTTCTCGGA  
 RRIC110\_nad6 -----  
 Millettia pinnata A-TCCAAGTGAGATACTAATAAAGTAAAGTATAAAGGGCTTTTGC-----  
 BPM24\_nad6 -----  
 Lotus japonicus A-TCCAAGTGAGATACTAATAAAGTAAAGTATAAAGGGCTTTTGC---  
 PB235\_nad6 -----  
 RRIT251\_nad6 -----  
 RRIM600\_nad6 -----  
 Cycas taitungensis GCTACCACTACTATATAAAGAGAGGGGGCCACTACTGCTGCGC-----  
 Zea mays mays AATAGAAAGGATTTAT-AGCGGGCCGGGGAGGAGCAATCTTTAGTAGAA  
 Megaceros aenigmaticus -----













Oryza sativa Japonica

GCGAAGAGCAGCACCTTACGATGTTUATGACCAATUGGATUUTTACGTAC  
\*\*\*\*\* \*\*

Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_nad7  
PB235\_nad7  
BPM24\_nad7  
RRIC110\_nad7  
RRIM600\_nad7  
RRIT251\_nad7  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
Silene latifolia  
Lotus japonicus  
Millettia pinnata  
Oryza sativa Japonica

CAGTAGGTACCAGAGGAGATUGCTATGATCGTTACTGTATUCGTATUGAA  
CCGTAGGTACCAGAGGAGATTGCTATGATCGTTACTGTATUCGTATCGAA  
CAGTAGGTACCAGAGGAGATUGCTATGATCGTTACTGTATUCGTATUGAA  
CAGTAGGTACCAGAGGAGATUGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATCGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATCGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATCGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATCGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATCGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATUGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATUGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATUGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATUGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATUGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATUGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATUGCTATGATCGTTACTGTATCCGTATCGAA  
CAGTAGGTACCAGAGGAGATUGCTATGATCGTTACTGTATCCGTATCGAA  
\* \*\*\*\*\* \*\*

Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_nad7  
PB235\_nad7  
BPM24\_nad7  
RRIC110\_nad7  
RRIM600\_nad7  
RRIT251\_nad7  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
Silene latifolia  
Lotus japonicus  
Millettia pinnata  
Oryza sativa Japonica

GAGATGCGACAAAGTGTTTCGGATCATTGTGCAATGTCUTAATCAAATGCC  
GAGATGCGACAAAGTGTTTCGTATCATTGTGCAATGTCUTAATCAAATGCC  
GAGATGCGACAAAGTCTTCGGATCATTGTGCAATGTCCTTAATCAAATGCC  
GAGATGCGACAAAGTCTTCGGATCATTGTGCAATGTCCTTAATCAAATGCC  
GAGATGCGACAAAGTGTTTCGGATCATTGTGCAATGTCUTAATAAAATGCC  
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GAGATGCGACAAAGTGTTTCGGATCATTGTGCAATGTCUTAATAAAATGCC  
GAGATGCGACAAAGTGTTTCGGATCATTGTGCAATGTCUTAATAAAATGCC  
GAGATGCGACAAAGTGTTTCGGATCATTGTGCAATGTCUTAATAAAATGCC  
GAGATGCGACAAAGTGTTTCGGATCATTGTGCAATGTCUTAATAAAATGCC  
GAGATGCGACAAAGTGTTTCGGATCATTGTGCAATGTCUTAATAAAATGCC  
GAGATGCGACAAAGTGTTTCGGATCATTGTGCAATGTCUTAATAAAATGCC  
GAGATGCGACAAAGTGTTTCGGATCATTGTGCAATGTCUTAATAAAATGCC  
GAGATGCGACAAAGTGTTTCGGATCATTGTGCAATGTCUTAATAAAATGCC  
\*\*\*\*\* \*\*

Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_nad7  
PB235\_nad7  
BPM24\_nad7  
RRIC110\_nad7  
RRIM600\_nad7  
RRIT251\_nad7  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima  
Silene latifolia  
Lotus japonicus  
Millettia pinnata  
Oryza sativa Japonica

TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGCGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGCGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
TAGTGGCATGATCAAAGCCGATGATCGTAAGCTATGTCCTCCATCACGAT  
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Citrullus lanatus  
Cucurbita pepo

CTCGAATGAAACTATCCATGGAATCCTUAATTCACCATTTCGAACTTTAT  
CTCGAATGAAACTATCCATGGAATCCTUAATTCACCATTTCGAACTTTAT





BPM24\_nad9  
Millettia pinnata  
Millettia pinnata  
Lotus japonicus  
RRIC110\_nad9  
RRIT251\_nad9  
RRII105\_nad9  
RRIM600\_nad9  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

-----  
-----AACCGGCGATTTACAACAAAGAAGTCTTTCCTCAT  
-----AACCGGCGATTTACAACAAAGAAGTCTTTCCTCAT  
-----CCAACCGGCGATTTACAACAAACAAGTCTTTCCTCAT  
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-----TGGGATATTATAACTTTTCGTTGGTTCAGAGG

Arabidopsis thaliana  
Brassica napus  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
PB235\_nad9  
Citruillus lanatus  
Cucurbita pepo  
BPM24\_nad9  
Millettia pinnata  
Millettia pinnata  
Lotus japonicus  
RRIC110\_nad9  
RRIT251\_nad9  
RRII105\_nad9  
RRIM600\_nad9  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

TTGAA----GAGCAAG----AAGCGGAACTACAAGAAAGCTTTCTTTAT  
TTGAA----GAGCAAG----AAGCGGAACTACAAGAAAGCTTTCTTTAT  
TTTT----GAGCAAG----AAGCGGAACTACAAGAAAGCTTTCTTTCT  
TTTT----GAGCAAG----AAGCGGAACTACAAGAAAGCTTTCTTTCT  
-----AAGCGGAACTACAAGAAAGCTTTCTTTCT  
TTTA----GAGCAAG----AAGCGGAA----AAGAAAGCTTTCTTTAT  
GCTTA----GAGCAAG----AAGCGGAACCAAAATCAAGCTTTCTTTAT  
-----  
TGGTC----GAGCAAG----AAGCGGAACGACAAGAAAGCTTTCTTTAT  
TTTTC----GAGCAAG----AAGCGGAACTACAATCAAGCTTTCTTTAT  
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TTTTTTTTAGAGCAAGAAAAGAAGCGGAACTACAAGAAAGCTTTCTTTAT  
TTTTTTTTAGAGCAAGAAAAGAAGCGGAACTACAAGAAAGCTTTCTTTAT  
TTTTTT--AGAGCAAGAAAAGAAGCGGAACTACAAGAAAGCTTTCTTTAT  
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-----AT  
-----AT  
GTAGAACTACATCTTCCTTCATGAAGATATGTTAAAAAATACAATTAAT

Arabidopsis thaliana  
Brassica napus  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
PB235\_nad9  
Citruillus lanatus  
Cucurbita pepo  
BPM24\_nad9  
Millettia pinnata  
Millettia pinnata  
Lotus japonicus  
RRIC110\_nad9  
RRIT251\_nad9  
RRII105\_nad9  
RRIM600\_nad9  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

CTT----TATGGATAACCAATTCATTTTCAAATATAGTTGGGAGACTTTA  
CTT----TATGGATAACCAATUCATTTTCAAATATAGTTGGGAGACTTTA  
CTT----TATGGATAACCAATTCATTTTCAAATATAGTTGGGAGACTTTA  
CTT----TATGGATAACCAATTCATTTTCAAATATAGTTGGGAGACTTTA  
CTT----TATGGATAACCAATTCATTTTCAAATATAGTTGGGAGACTTTA  
CTT----TATGGATAACCAATTCATTTTAAAAATATAGTTGGGAGACTTTG  
TTTCATTTATGUAATAACCAATCCATTTTCAAATATAGTTGGGAGATTTTA  
-----ATGGATAACCAATCCATTTTCAAATATAGTTGGGAAACTCTC  
CCTTCCTTATGGATAACCAATUCTTTTTCAAATATAGTTGGGATACTCTC  
CTTT----ATGGATAACCAATUCATTTTCAAATATAGTTGGGAGACTCTC  
-----ATGGATAACCAATCCATTTTCAAATATAGTTGGGAAACTCTC  
-----ATGGATAACCAATUCATTTTCAAATATAGTTGGGAGACTTTA  
-----ATGGATAACCAATUCATTTTCAAATATAGTTGGGAGACTTTA  
-----ATGGATAACCAATUCATTTTCAAATATAGTTGGGAGACTTTA  
-----ATGGATAACCAATCCATTTTCAAATATAGTTGGGAAACTCTC  
-----ATGGATAACCAATCCATTTTCAAATATAGTTGGGAAACTCTC  
-----ATGGATAACCAATCCATTTTCAAATATAGTTGGGAAACTCTC  
-----ATGGATAACCAATCCATTTTCAAATATAGTTGGGAAACTCTC  
-----ATGGATAACCAATCCATTTTCAAATATAGTTGGGAAACTCTC  
GG-----ATA--AGC-AATTGTTTCTCAAATCTCTGATAGCTACTTTA  
GG-----ATA--AGC-AATTGTTTCTCAAATCTCTGATAGCTACTTTA  
TT-----AUG--AACCAATTGTTTTTCAAATTTATGAAAGCTACTTTA  
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Arabidopsis thaliana  
Brassica napus  
Beta macrocarpa

CCCAAGAAATGGGTCAAAAAAATGGAAAGATCGGAACATGGGAATAGATU  
CCCAAGAAATGGGTCAAAAAAATGGAAAGATCGGAACATGGGAATAGATU  
CCCAAGAAATGGGTCAAAAAAATAGAAAAATCGAACATGGGAATAGATU



Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
PB235\_nad9  
Citrullus lanatus  
Cucurbita pepo  
BPM24\_nad9  
Millettia pinnata  
Millettia pinnata  
Lotus japonicus  
RRIC110\_nad9  
RRIT251\_nad9  
RRII105\_nad9  
RRIM600\_nad9  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

CCCAAGAAATGGGTCAAAAAAATAGAAAAATCAGAACATGGGAATAGATU  
CCCAAGAAATGGGTCAAAAAAATAGAAAAATCAGAACATGGGAATAGATU  
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CCCAAGAAATGGGTACATAAAATGAAAAGATCGGAACATGGGAATAGATU  
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CC---GAAACGGATACATCAATTTAAAACATCGAAACATGAAAATATATT  
CC---TAAACGGATAAATCAATGTCAAACATCAAACAAGAAAATCTATT  
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Arabidopsis thaliana  
Brassica napus  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
PB235\_nad9  
Citrullus lanatus  
Cucurbita pepo  
BPM24\_nad9  
Millettia pinnata  
Millettia pinnata  
Lotus japonicus  
RRIC110\_nad9  
RRIT251\_nad9  
RRII105\_nad9  
RRIM600\_nad9  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

TGATACCAATACGGACTACCTATTTCAATTGTTGTGCTTTCTCAAATTGC  
TGATACCAATACGGACTACCTATTTCAATTGTTGTGCTTTCTCAAATTGC  
TGATACCAATACGGACTACCUATTTCAATTGTTGTGCTTTCTCAAATTGC  
TGATACCAATACGGACTACCUATTTCAATTGTTGTGCTTTCTCAAATTGC  
TGATACCAATACGGACTACCUATTTCAATTGTTGTGCTTTCTCAAATTGC  
TTATACCAATACTGACTACCUATTTCCATTGTTGTGCTTTCTAAAATGGC  
TGATACCAATTCGGATTACCTATTTCAATTGTTGTGCTTTCTCAAATTGC  
GGATACCAATACAGACTACCTATTTCAATTGTTGTGCTTTCTCAAATTGC  
GGATACCAATACGGACTACCTATTTCAATTGTTGTGCTTTCTCAAATTGC  
TGATACCAATTCGGATTACCTATTTCAATTGTTGTGCTTTCTCAAATTGC  
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TGATACCAAAAACGGACTACCTATTTCAATTGTTGTGCTTTCTCAAATTGC  
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ATATACCAATCCAGATTACCTGTTTGAATTAATGTTTCTGAAACATC  
ATATACCAATCCAGACTACCAATTCAATTATGTTTGTGAAATATC  
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Arabidopsis thaliana  
Brassica napus  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
PB235\_nad9  
Citrullus lanatus  
Cucurbita pepo  
BPM24\_nad9  
Millettia pinnata  
Millettia pinnata  
Lotus japonicus  
RRIC110\_nad9  
RRIT251\_nad9  
RRII105\_nad9  
RRIM600\_nad9  
Megaceros aenigmaticus

ATACCTATAAAGGGTTCAAGTTTUGATCGATATTTGCGGAGTTGATUAT  
ATACCTATAAAGGGTTCAAGTTTUGATCGATATTTGCGGAGTTGATUAT  
ATACCTATAAAGGGTTTCAAGTTTTGATCGATATTTGCGGAGTTGATTAT  
ATACCTATAAAGGGTTTCAAGTTTTGATCGATATTTGCGGAGTTGATTAT  
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ATACCTATAAAGGGTTTCAAGTTTTGATCGATATTTGCGGAGTTGATTAT  
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ATACCTATAAAGGGTTTCAAGTTTUGATCGATATTTGCGGAGTTGATTAT  
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ATACCTATAAAGGGTTTCAAGTTTUGATCGATATTTGCGGAGTTGATUAT  
ATACCTATAAAGGGTTTCAAGTTTUGATCGATATTTGCGGAGTTGATUAT  
ATACCTATAAAGGGTTTCAAGTTTNGATCGATATTTGCGGAGTTGATNAT  
ATACCAATACACGTTTTTCAAGTTTTGATTGATATTCGCGGAGTTGATTAT





Silene latifolia  
Oryza sativa Japonica  
PB235\_nad9  
Citrullus lanatus  
Cucurbita pepo  
BPM24\_nad9  
Millettia pinnata  
Millettia pinnata  
Lotus japonicus  
RRIC110\_nad9  
RRIT251\_nad9  
RRII105\_nad9  
RRIM600\_nad9  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

CTCTGAGTGGATATGTAGAAGTACGCTATGATGATCCAGAGAAACGTGTG  
CTCTGAGTGGATATGTGGAAGTACGCTATGATGATCCAGAGAAACGTGTG  
CTCTGAGTGGATATGTGGAAGTACGCTATGATGATCCAGAGAAACGTGTA  
CTCTGAGTGGATATGTGGAAGTACGCTATGATGATCCAGAGAAACGTGTG  
CTCTGAGTGGATATGTGGAAGTACGCTATGATGATCCAGAGAAACGTGTG  
CTCTGAGTGGATATGTGGAAGTACGCTATGATGATCCAGAGAAACGTGTA  
CTCTGAGCGGATATGTAGAAGTACGCTATGATGATCCGGAGAAACGTGTG  
CTCTGAGCGGATATGTAGAAGTACGCTATGATGATCCGGAGAAACGTGTG  
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CTTTAAGTGGATACTTCGAGGTACGCTATGATGATTCCGAAAAACGCGTG  
CTTTAAGTGGATATTTTCGAGGTACGTTATGATGATTCCGAGAAACGTGTG  
CTTTGAGTGGATATGTGGAAGTACGTTATGATGATTCCAGAGAAACGTGTG  
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Arabidopsis thaliana  
Brassica napus  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
PB235\_nad9  
Citrullus lanatus  
Cucurbita pepo  
BPM24\_nad9  
Millettia pinnata  
Millettia pinnata  
Lotus japonicus  
RRIC110\_nad9  
RRIT251\_nad9  
RRII105\_nad9  
RRIM600\_nad9  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

GTTTCTGAACCCATTGAGATGACCCAAGAATTTTCGCTATTTTCGATTTTGC  
GTTTCTGAACCCATTGAGATGACCCAAGAATTTTCGCTATTTTCGATTTTGC  
GTTTCTGAGCCATTGAGATGACCCAAGAATTTTCGCTATTTTCGATTTTGC  
GTTTCTGAGCCATTGAGATGACCCAAGAATTTTCGCTATTTTCGATTTTGC  
GTTTCTGAGCCATTGAGATGACCCAAGAATTTTCGCTATTTTCGATTTTGC  
GTTTCTGAGCCATTGAGATGACCCAAGAATTTTCGCTATTTTCGATTTTGC  
GTTTCTGAACCCATTGAGATGACCCAAGAATTTTCGCTATTTTCGATTTTGC  
GTTTCTGAACCCATTGAGATGACCCAAGAATTTTCGCTATTTTCGATTTTGC  
GTTTCTGAACCCATTGAGATGACCCAAGAATTTTCGCTATTTTCGATTTTGC  
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GTTTCTGAACCAATTGAGATGACTCAAGAATTTTCGCTATTTTTCGATTTTGC  
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Arabidopsis thaliana  
Brassica napus  
Beta macrocarpa  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Silene latifolia  
Oryza sativa Japonica  
PB235\_nad9  
Citrullus lanatus  
Cucurbita pepo  
BPM24\_nad9  
Millettia pinnata  
Millettia pinnata  
Lotus japonicus  
RRIC110\_nad9  
RRIT251\_nad9  
RRII105\_nad9  
RRIM600\_nad9  
Megaceros aenigmaticus  
Phaeoceros laevis  
Huperzia squarrosa

TAGTCCTTGGGAACACGCG-----TAGCGACGGATAATTCAGAATCAGAA  
TAGTCCTTGGGAACACGCG-----TAGCGACGGATAATTCAGAATCAGAA  
TAGTCCTTGGGAACAACGTAACGGTAACGGAAGGATAATTCGGAATCAGAA  
TAGTCCTTGGGAACAACGTAACGGTAACGGAAGGATAATTCGGAATCAGAA  
TAGTCCTTGGGAACAACGTAACGGTAACGACGGATAATTTGGAATCATAA  
TAGTCCTTGGGAACACGCG-----TAGCGACGGATAATTCGGAATCTACA  
TAGTCCTTGGGAACACGCG-----TAGCGACAGATAA-----  
TAGTCCTTGGGAACACGCG-----TAGCGACAGATAAATTAAGAAGAAGAA  
TAGTCCTTGGGAACACGCG-----TAGCGACAGATAAATTCAGAATCAGAA  
TAGTCCTTGGGAACACGCG-----TAGCGACAGATAA-----  
TAGTCCTTGGGAACACGCG-----TAGCGACGGATAATTCAGAATCAGAA  
TAGTCCTTGGGAACACGCG-----TAGCGACGGATAATTCAGAATCAGAA  
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TAGTCCTTGGGAACACGCG-----TAGCGACAGATAA-----  
TAGTCCTTGGGAACACGCG-----TAGCGACAGATAA-----  
TAGTCCTTGGGAACACGCG-----TAGCGACAGATAA-----  
CAGTCCTTGGGAA-----GTCGCGTCGTTACGAATCA--AATGA-----  
CAGTCCTTGGGAA-----ATCGCGTCGTTACGAATCA--AATGA-----  
TAGTCCTTGGGAUUAAATGTTGCTATGTGACGAATCA--AAAAACAAGTA

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Arabidopsis thaliana	TAGGTCCACC-----AGTCCAGGGGACAAATCAATAGGAAATGCTATAGG
Brassica napus	TAGGTCCACC-----AGTCCAGGGGACAAATCAATAGGAAATGCTATTTG
Beta macrocarpa	TAAGTCCA-----GTCCAGGGGACAAATCAATAGGAAATGCTATTTG
Beta vulgaris maritima	TAAGTCCA-----GTCCAGGGGACAAATCAATAGGAAATGCTATTTG
Beta vulgaris vulgaris	TAAGTCCA-----GTCCAGGGGACAAATCAATAGGAAATGCTATTTG
Silene latifolia	TAAGTCCA-----GTCCAGGGGACAAAGAAATAGGAAATGCTATTTG
Oryza sativa Japonica	TAAGTCCA-----GTCCAGGGGACAAAGAAATAGGAAATGCTATTTG
PB235_nad9	TAAGTCCA-----GTCCAGGGGACAAAGAAATAGGAAATGCTATTTG
Citrullus lanatus	TAGGTCCAGTCC----AG----GGGACAAATCAATAGGAAATGCTATTTG
Cucurbita pepo	TAGGTCCAGTCC----AGCCAGGGGACAAATCAATAGGAAATGCTATTTG
BPM24_nad9	TAGGTCCAGTCC----AGCCAGGGGACAAATCAATAGGAAATGCTATTTG
Millettia pinnata	TAGGTCC-----GGATAGGGGACAAATCAATAGGAAATGCTATTTG
Millettia pinnata	TAGGTCC-----GGATAGGGGACAAATCAATAGGAAATGCTATTTG
Lotus japonicus	TAGGTCCAGCTCTATAGGATAGGGGACAAATCAATAGGAAATGCTATTTG
RRIC110_nad9	-----
RRIT251_nad9	-----
RRII105_nad9	-----
RRIM600_nad9	-----
Megaceros aenigmaticus	-----
Phaeoceros laevis	-----
Huperzia squarrosa	TAAATAAAATTAT--AGAGGAAGGATTACTACATTGGATAAACAATCCC

Arabidopsis thaliana	AA---ATGCTATTTGC----TTTGTAAAGAAGACTTC-----
Brassica napus	CT---TTGTAAGAAGA----CTTCTATGAAAGTCTT-----
Beta macrocarpa	CT---TCGTAAGAAGA----CTTCTATGAAATGAAAGA--
Beta vulgaris maritima	CT---TCGTAAGAAGA----CTTCTATGAAATGAAAGA--
Beta vulgaris vulgaris	CT---TCGTAAGAAGA----CTTCTATGAAATGAAAGA--
Silene latifolia	CT---TCGTAAGAAGA----CTTCTATGAAATGAAAAAGT
Oryza sativa Japonica	CT---TCTTAAGAAGAAGAACTTTTTTTGAA-----
PB235_nad9	-----
Citrullus lanatus	CT---TTGTCAGAATA----AAAAGAAGAACTTGTA---
Cucurbita pepo	CTGCTTTGTCAGAATA----AAAAGAAGAA-----
BPM24_nad9	-----
Millettia pinnata	CT---TTGTAAGAAGA----AGAATAAACTTCTATGAAAT
Millettia pinnata	CT---TTGTAAGAAGA----AGAATAAACTTCTATGAAAT
Lotus japonicus	CT---TTGTAAGAAGA----AGAATAAACTT-----
RRIC110_nad9	-----
RRIT251_nad9	-----
RRII105_nad9	-----
RRIM600_nad9	-----
Megaceros aenigmaticus	-----
Phaeoceros laevis	-----
Huperzia squarrosa	AGA-----

#####

**rpl16 multiple sequence alignment**

Arabidopsis thaliana	-----TATATGTTTTTCUGGTCGATTAA
BPM24_rpl16	-----
RRII105_rpl16	-----
RRIC110_rpl16	-----
PB235_rpl16	-----
RRIT251_rpl16	-----
RRIM600_rpl16	-----
Oryza sativa Japonica	ATGCCAAAAGGGGTGGAGGGGATACGTATTTGTTGTTCTGGTCGATTAGG
Lotus japonicus	--GAAAAAAGGGGTTGAGGGGATCCGTATATGTTGTTCTAGGTAGATUAGA
Millettia pinnata	ATGAAAAAAGGGGTTGAGGGGATCCGTATATGTTGTTCTAGGTAGATUAAA
Citrullus lanatus	-----
Cucurbita pepo	-----

Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

AGACGCAGCAGAAAAAGCTCAAACCTAAATGCTATAAGCATAGAAAACTT  
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-----  
GGGTGCGG---AAATAGCTAGAACTGAATGCGGAAAAGTATGGAAAAACAT  
AGGCGCAG---AAATAGCTAGAACTGAATGCGGAAAAGTATGGAAAAACAT  
AGGCGCAG---AAATAGCTAGAACTGAATGCGGAAAAGTATGGAAAAACAT  
-----  
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Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

CTUGTAATGTATTTAACCATAAAAATCGATTATGCTCCTGUGGAAGTATUT  
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-----  
CTTGTAATGTATTTAACCAGAAAATCGATTATGCTUTTGCGGAAGTATCC  
CTUGTAATGTATTTAACCAGAAAATCGATTATGCTTCTGCGGAAGTATCT  
CTUGTAATGTATTTAACCAGAAAATCGATTATGCTTCTGCGGAAGTATCT  
-----CT  
-----TATCT

Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

ACTCGTTACGGAATCTUAGGTGTCAAAGTGTGGATTTTCATATAGTCAAAA  
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-----  
ACTCGTAACGGAATTTUAGGTGTCAAAGTUGGATCTCATATAGTCAAAA  
ACTCGTTACGGAATCTUAGGTGTCAAAGTGTGGATTTTCATATAGTCAAAA  
ACTCGTTACGGAATCTUAGGTGTCAAAGTGTGGATTTTCATATAGTAAAAA  
ACTCGTTATGGAATCTCAGGTGTCAAAGTGTGGATTTTCATATAAAAAAAA  
ACTCGTTATGGAATCTTAGGTGTCAAAGTGTGGATTTTCATATAAAAAACA

Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

AAAAAGGGGACGTGCTATATCCGAAACGTACGAAATATAGTAAATATCGT  
-----ATGCTATATCCGAAACGTACGAAATATAGTAAATATCGT  
-----ATGCTATATCCGAAACGTACGAAATATAGTAAATATCGT  
-----ATGCTATATCCGAAACGTACGAAATATAGTAAATATCGT  
-----ATGCTATATCCGAAACGTACGAAATATAGTAAATATCGT  
-----ATGCTATATCCGAAACGTACGAAATATAGTAAATATCGT  
-----ATGCTATATCCGAAACGTACGAAATATAGTAAATATAGT  
AAAAAGGGGACGTGCTATATCCGAAACGTACGAAATTTAGTAAATATCGT  
AAAAAGGGGACGTGCTATATCCGAAACGTACGAAATTTAGTAAATATCGT  
AAAAAGGGAACGTGTTATATCCGAAACGTACGAAATATAGTAAATATCGT  
AAAAAGGGAACGTGTTATATCCGAAACGTACGAAATATAGTAAATATCGT  
AAAAAGGGAACGTGTTATATCCGAAACGTACGAAATATAGTAAATATCGT  
\*\* \*\*\*\*\* \*\*

Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16

AAAGGCAGATGTAGTAGGGGTTGCAAACCGGATGGTACAAAACCTGGGTTT  
AAAGGCAGATGTAGTAGGGGTTGCAAACCTGGACGGTACACAACCTGGGTTT  
AAAGGCAGATGTAGTAGGGGTTGCAAACCTGGACGGTACACAACCTGGGTTT  
AAAGGCAGATGTAGTAGGGGTTGCAAACCTGGACGGTACACAACCTGGGTTT

PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

AAAGGCAGATGTAGTAGGGGTTGCAAACCTGGACGGTACACAACCTTGGTTT  
AAAGGCAGATGTAGTAGGGGTTGCAAACCTGGACGGTACACAACCTTGGTTT  
AAAGGCAGATGTAGTAGGGGTTGCAAACCTGGACGGTACACAACCTTGGTTT  
AAATGCAGATGTAGTAGGGGTTGCGAACCGGATGGTACACAACCTTGGTTT  
AAAGGCAGATGTAGTAGGGGTTGCAAACCGACCGGAACAAAACCTTGGTTT  
AAAGGCAGATGTAGTAGGGGTTGCAAACCGACCGGAACAAAACCTTGGTTT  
AAAGGCAGATGTAGTAGGGGTTGCAAACCGGACGGTACACAACCTTGGTTT  
AAAGGCAGATGTAGTAGGGGTTGCAAACCGGACGGTACACAACCTTGGTTT  
\*\*\* \*\*\*\*\* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \*

Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

TGGAAGATATGGCAUTAAAAGTTGTAAGCTGGTUGTCTTTTCATATCGAG  
TGGAAGATATGGCAUTAAAAGTTGTAAGCTGGTTCGTCTTTTCATATCGAG  
TGGAAGATATGGCAUTAAAAGTTGTAAGCTGGTTCGTCTTTTCATATCGAG  
TGGAAGATATGGCAUTAAAAGTTGTAAGCTGGTTCGTCTTTTCATATCGAG  
TGGAAGATATGGCAUTAAAAGTTGTAAGCTGGTTCGTCTTTTCATATCGAG  
TGGAAGATATGGCAUTAAAAGTTGTAAGCTGGTTCGTCTTTTCATATCGAG  
TGGAAGATATGGUAAUAAAAGTTGTAGAGCTGGTTCGTCTTTTCATATCGAG  
TGGAAGATATGGCAUTCAAAGTTGTAGAGCTGGTTCGTCTTTTCATATCGAG  
TGGAAGATATGGCAUTCAAAGTTGTAGAGCTGGTTCGTCTTTTCATATCGAG  
TGGAAGATATGGCAUTCAAAGTTGTAGAGCTGGTTCGTCTTTTCATATCGAG  
TGGAAGATATGGCAUTCAAAGTTGTAGAGCTGGTTCGTCTTTTCATATCGAG  
TGGAAGATATGGCAUTCAAAGTTGTAGAGCTGGTTCGTCTTTTCATATCGAG  
\*\*\*\*\* \*\* \*\*\*\*\* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \*

Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

CCATTGAAGCAGCGCGTCGGGCTATAATCGGACACTTTCATCGTGCTATG  
CCATTGAAGCAGCGCGTCGGGCTATAATAGGACAATCCATCGTGCTATG  
CCATTGAAGCAGCGCGTCGGGCTATAATAGGACAATCCATCGTGCTATG  
CCATTGAAGCAGCGCGTCGGGCTATAATAGGACAATCCATCGTGCTATG  
CCATTGAAGCAGCGCGTCGGGCTATAATAGGACAATCCATCGTGCTATG  
CCATTGAAGCAGCGCGTCGGGCTATAATAGGACAATCCATCGTGCTATG  
CCATTGAAGCAGCGCGTCGGGCTATAATAGGACAATCCATCGTGCTATG  
CCATTGAAGCAGCGCGTCGGGCTATAATAGGACAATCCATCGTGCTATG  
CCATTGAAGCAGCGCGTCGGGCTATAATCGGACACTTCCATCGTGCTATG  
CCATTGAAGCAGCGCGTCGGGCTATAATCGGACACTTCCATCGTGCTATG  
CCATTGAAGCAGCGCGTCGGGCTATAATCGGACACTTCCATCGTGCTATG  
CCATTGAAGCAGCGCGTCGGGCTATAATCGGACAATCC-----  
CCATTGAAGCAGCGCGTAGGGCTATAATCGGACAATCCATCGTGCTATG  
\*\*\*\*\* \*\*\*\*\* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \* \*\* \*

Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

AGCGGACAATCCGAAGAAATGGTAAGATATGGGTAAGAGTTTTTCGCGGA  
AGCGGACAATCCGAAGAAATGGTAAGATATGGGTAAGAGTTUTCGCAGA  
AGCGGACAATCCGAAGAAATGGTAAGATATGGGTAAGAGTTUTCGCAGA  
AGCGGACAATCCGAAGAAATGGTAAGATATGGGTAAGAGTTUTCGCAGA  
AGCGGACAATCCGAAGAAATGGTAAGATATGGGTAAGAGTTUTCGCAGA  
AGCGGACAATCCGAAGAAATGGTAAGATATGGGTAAGAGTTUTCGCAGA  
AGCGGACAATCCGAAGAAATGGTAAGATATGGGTAAGAGTTUTCGCAGA  
AGCGGACAATCCGAAGAAATGGTAAGATATGGGTAAGAGTTUTCGCAGA  
AGCGGACAATCCGAAGAAATGGTAAGATATGGGTAAGAGTTUTCGCAGA  
-----GAAGAAATGGTAAATATGGGTAAGAGTTUTCGCAGA  
AGCGGACAATCCGAAGAAATGGTCAAATATGGGTCAGAGTTUTAGCAGA  
\*\*\* \*\*\*\* \* \* \*\*\*\*\* \*\* \* \*\* \* \*\* \*

Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata

TCTCCCTATTACCGGAAACCCACAGAAGTAAGAATGGGAAGAGGAAAAG  
TCTCCCTATTACCGGAAACCTACAGAAGTAAGAATGGGAAGAGGAAAAG  
TCTCCCTATTACCGGAAACCTACAGAAGTAAGAATGGGAAGAGGAAAAG  
TCTCCCTATTACCGGAAACCTACAGAAGTAAGAATGGGAAGAGGAAAAG  
TCTCCCTATTACCGGAAACCTACAGAAGTAAGAATGGGAAGAGGAAAAG  
TCTCCCTATTACCGGAAACCTACAGAAGTAAGAATGGGAAGAGGAAAAG  
TCTCCCTATTACCGGAAACCTACAGAAGTAAGAATGGGAAGAGGAAAAG  
TCTCCCTATTACCGGAAACCCGAGAAGTTCGAATGGGAAGAGGAAAAG  
TATCCCTATTACCGGAAACCTACAGAAGTAAGAATGGGAAGAGGAAAAG  
TATCCCTATTACCGGAAACCTACAGAAGTAAGAATGGGAAGAGGAAAAG

Citrullus lanatus  
Cucurbita pepo

TCTCCCTATTACCGGAAACCTACAGAAGTCAGAATGGGAAGAGGAAAAG  
TCTCCCCATTACCGGAAACCTACAGAAGTCAGAATGGGAAGAGGAAAAG  
\* \* \*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\*

Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

GAAATCCTACGGGTTGGATTGCTCGTGTGTCCACGGGACAAATCCUATTT  
GAAATCCTACGGGTTGGATTGCTCGTGTGTCTACGGGACAAATCCUATTT  
GAAATCCTACGGGTTGGATTGCTCGTGTGTCTACGGGACAAATCCUATTT  
GAAATCCTACGGGTTGGATTGCTCGTGTGTCTACGGGACAAATCCUATTT  
GAAATCCTACGGGTTGGATTGCTCGTGTGTCTACGGGACAAATCCUATTT  
GAAATCCTACGGGTTGGATTGCTCGTGTGTCTACGGGACAAATCCUATTT  
GAAATCCTACGGGTTGGATTGCTCGTGTGTCTACGGGACAAATCCUATTT  
GAAATCCTACGGGTTGGATTGCTCGTGTGTCTACGGGACAAATCCUATTT  
GAAATCCTACGGGTTGGATTGCTCGTGTGTCTACGGGACAAATCCUATTT  
GAAATCCTACGGGTTGGATTGCTCGTGTGTCTACGGGACAAATCCUATTT  
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Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

GAAATGGATGGTGTGAGTTTGGCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
GAAATGGATGGTGTGAGTTTGTCAAATGCTCGACAAGCCGCTACATTAGC  
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Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

GGCTCATAAACUATGTTUGTCAACCAAGTTTGTTCAGTGGTCGTAUUGTA  
GGCGCATAAACUATGTTUGTCAACCAAGTTTGTTCATGGTTCGTA----  
GGCGCATAAACUATGTTUGTCAACCAAGTTTGTTCATGGTTCGTA----  
GGCGCATAAACUATGTTUGTCAACCAAGTTTGTTCATGGTTCGTA----  
GGCGCATAAACUATGTTUGTCAACCAAGTTTGTTCATGGTTCGTA----  
GGCGCATAAACUATGTTUGTCAACCAAGTTTGTTCATGGTTCGTA----  
GGCGCATAAACUATGTTUGTCAACCAAGTTTGTTCATGGTTCGTAACGTA  
GGCGCATAAACUATGTTUGTCAACCAAGTTTGTTCAGTGGTTCGTAACGTA  
GGCGCATAAACUATGTTUGTCAACCAAGTTTGTTCAGTGGTTCGTAACGTA  
GGCGCATAAACUATGTTUGTCAACCAAGTTTGTTCAGTGGTTCGTAACGTA  
GGCGCATAAACUATGTTUGTCAACCAAGTTTGTTCAGTGGTTCGTAACCTC  
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Arabidopsis thaliana  
BPM24\_rpl16  
RRII105\_rpl16  
RRIC110\_rpl16  
PB235\_rpl16  
RRIT251\_rpl16  
RRIM600\_rpl16  
Oryza sativa Japonica  
Lotus japonicus  
Millettia pinnata  
Citrullus lanatus  
Cucurbita pepo

ATT---GGTTAGTGGGGATAAAGCGGGCCGAGAATCTTATGTCAAAGT  
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ATT---GGTTAGTGGGGAAAAACCGGGCCGGGACTCA----AAAGAAT  
ATT---GGTTAGTGGGGAAAAACCGGGCCGGGATTCA----AAATAAT  
ATT---GGTTAGTGGGGAAAAACCGGGCCGGGATTCA----AAAGATT  
ATTAATTGTTAGTGGGGATAAAGCGGGCCGGGATTCA----AAAGAAT  
ATTTATTGTTAGTGGGGATAAAGCGGGCCGGGATTCA----AAAGAAT

Arabidopsis thaliana  
BPM24\_rpl16

AAGGACCAAGGATAATCTTTTUGGAAAGGAG-----  
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RRII105_rpl16 -----
RRIC110_rpl16 -----
PB235_rpl16 -----
RRIT251_rpl16 -----
RRIM600_rpl16 -----
Oryza sativa Japonica TTGGCGAAGTGTTCCTGAACGAGGGAAGTGGAAA--
Lotus japonicus TAGGCGAAGGGTTTGTTCCTGAACGAGGGAAGTGGAAAAGA
Millettia pinnata TAGGCGAAGGGTTTGTTCCTGAACGAGGGAAGTGGAAA--
Citrullus lanatus TGGGCGAAGTGT-----
Cucurbita pepo TGGGCGAAGTGTTCG-----

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**rpl5 multiple sequence alignment**

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Citrullus lanatus -----TTTCCGTTTCATTCAACCAACTATCTTTTTGAAGCAGATAGTT
Cucurbita pepo -----AATCAGTCTCATTCAACCAACTATCTTTTTGAAGCAGATAGTT
Arabidopsis thaliana ATGTCAAAGGACCAAGGATGATCTTTTCGGAA---AGGAGGAGTAGGAG
Brassica napus ATGTCAAAGGACCAAGGATGATCTTTTCGGAA---AGGAGGAGTAGGAG
RRII105_rpl5 -----
Lotus japonicus -----ATCCCTCTATAGTTCTTCACTACTCCGTGCAGGAAAGACTCTCT
Millettia pinnata ----ACATCTAACTTTTCTTCACTACTCCGTGCAGGAAAGACTCTCT
RRIM600_rpl5 -----
RRIC110_rpl5 -----
Beta vulgaris maritima ----GAAAAAACCAACTATAAATATCCTACAAGTCTTTTTTTCATTTCTC
Beta vulgaris vulgaris ----GAAAAAACCAACTATAAATATCCTACAAGTCTTTTTTTCATTTCTC
Beta macrocarpa ----GAAAAAACCAACTATAAATATCCTACAAGTCTTTTTTTCATTTCTC
Silene latifolia -----TAGAGACCTCCCTTGATCTGTGCGGGATCTATCAGCAGCGGCAT
RRIT251_rpl5 -----
PB235_rpl5 -----
BPM24_rpl5 -----
Oryza sativa Japonica ----ACGTTGGTTTCGGTTCGATCAACTATCCTTTTTGAAGCGGATAGTT

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Citrullus lanatus CACAGTGCTCATTCTATAGATACTGTGTAAAAAAGCCAACTC-ATGTTTT
Cucurbita pepo CACAGTGCTCATTCTATAGATACTGTGTAAAAAAGCCAACTC-ATGTTTT
Arabidopsis thaliana GAGTCAGCTTATTCTATAGATACTG----TAAAAGCCAACTC-ATGTTTC
Brassica napus GAGTCAGCTTATTCTATAGATACTG----TAAAAGCCAACTC-ATGTTTC
RRII105_rpl5 -----ATGTTTC
Lotus japonicus TTCTGTCTGTATGGAGGGAATTTTT---CTCAATCAATCACTATGTTTC
Millettia pinnata TTCTGTATGGAGGGAATTTTGATTT---ATCAATCAATCACTATGTTTC
RRIM600_rpl5 -----ATGTTTC
RRIC110_rpl5 -----ATGTTTC
Beta vulgaris maritima GAGAGAGCAGTCAAAGAATGAATAA----GAAAAGCCAACTC-ATGTTTC
Beta vulgaris vulgaris GAGAGAGCAGTCAAAGAATGAATAA----GAAAAGCCAACTC-ATGTTTC
Beta macrocarpa GAGAGAGCAGTCAAAGAATGAATAA----GAAAAGCCAACTC-ATGTTTC
Silene latifolia TCTCCTCTATACTCTTTTTTGAAAC----GAAAAGCCAACTC-ATGTTTC
RRIT251_rpl5 -----ATGTTTC
PB235_rpl5 -----ATGTTTC
BPM24_rpl5 -----ATGTTTC
Oryza sativa Japonica CACAGTGCTCATTCTCAAAAAAAGCG--GAAAAGCCA--TGATGTTTC

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Citrullus lanatus CACTCGATTTTCATTACGAAGATGTATUACGTCAGGATCUU GTTGCTCAA
Cucurbita pepo CACTCGATTTTCATTACGAAGATGTATUACGTCAGGATCUU GTTGCTCAA
Arabidopsis thaliana CACTCAATTTTCATTACGAAGATGTATUACGTCAGGATCUU GTTGCTCAA
Brassica napus CACTCAATTTTCATTACGAAGATGTATUACGTCAGGATCUU GTTGCTCAA
RRII105_rpl5 CACTCTATTTTCATTACGAAGATGTATCACGTCAGGATCCGTTGCTCAA
Lotus japonicus CACTCAATTTTCATTACGAAGATGTATUACGTCAGGATCUU GTTGCTCAA
Millettia pinnata CACTCCATTTTCATTACGAAGATGTATUACGTCAGGATCUU GTTGCTCAA
RRIM600_rpl5 CACTCTATTTTCATTACGAAGATGTATCACGTCAGGATCCGTTGCTCAA
RRIC110_rpl5 CACTCTATTTTCATTACGAAGATGTATCACGTCAGGATCCGTTGCTCAA
Beta vulgaris maritima CCCTCCATTTTCATTACGAAGATGTTTCACGTCAGGATCUU GTTGCTCAA

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BPM24\_rpl5  
Oryza sativa Japonica

--GCTATGGAGATTUCATGCGGTTCAGAAATTCATACAGACACAAAGGGGT  
--GCTATGGAGATTTGTGCGGTTCAGAGATTCATACAGACACAAAGGGGC  
\*\*\*\*\* \*\*

Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_rpl5  
Lotus japonicus  
Millettia pinnata  
RRIM600\_rpl5  
RRIC110\_rpl5  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Silene latifolia  
RRIT251\_rpl5  
PB235\_rpl5  
BPM24\_rpl5  
Oryza sativa Japonica

TC-----GACAGGAAAGTCGTTTCGATCCAATCCATTCTTGGAGTC  
TC-----GACAGGAAAGTCCTTTCGATCCAATCCATTCTTGGAGTC  
TC-----GACAGGAAAGTCCTTTCGATCTAATCCATTCTTGGGGTC  
TC-----GACAGGAAAGTCCTTTCGATCTAATCCATTCTTGGGGTC  
TC-----GACAGGAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
TC-----GACAGGAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
TC-----GACAGGAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
TC-----GATAGGAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
TC-----GATAGGAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
TC-----GATAGGAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
TC-----GATAGTAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
TC-----GACAGGAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
TC-----GACAGGAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
TC-----GACAGGAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
TC-----GACAGGAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
CCTTATTTTAAAGCAGGAAAGTCGTTTCGATCCAATCCATTCTTGGGGTC  
\* \*\*

Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_rpl5  
Lotus japonicus  
Millettia pinnata  
RRIM600\_rpl5  
RRIC110\_rpl5  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Silene latifolia  
RRIT251\_rpl5  
PB235\_rpl5  
BPM24\_rpl5  
Oryza sativa Japonica

AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCCGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTAAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTAAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAAAAAGGATATGTUAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAAAAAGGATATGTUAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
AAATAAAGACAAA--GGATATGTCAGTGACCTAGCACGACAAAGCACTC  
CGAAAAAGCACT--GGATATGTCAGTGACCTTAGCACGACAAAGCGTTC  
\* \*\*

Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_rpl5  
Lotus japonicus  
Millettia pinnata  
RRIM600\_rpl5  
RRIC110\_rpl5  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Silene latifolia  
RRIT251\_rpl5  
PB235\_rpl5  
BPM24\_rpl5  
Oryza sativa Japonica

TCCGAGGGCATGGAATGTCGAATTTTTUGGTCAGAATCTUGACAGTAATG  
TCCGAGGGCATGGAATGTCGAATTTTTUGGTCAGAATCTCCACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTUGGTCAGAATCTUGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTUGGTCAGAATCTUGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTCGGTCAGAATCTUGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTUGGTCAGAATCTCGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTUGGTCAGAATCTCGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTCGGTCAGAATCTNGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTCGGTCAGAATCTUGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTCGGTCAGAATCTUGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTCGGTCAGAATCTUGACAGTAATG  
TCCGAGGGCATGGAATGTTTCATTTTTGGTCAGAATCTCGACAGTAATG  
TCCGAGGGCATGGAATGTTTCATTTTTGGTCAGAATCTCGACAGTAATG  
TCCGAGGGCATGGAATGTTTCATTTTTGGTCAGAATCTCGACAGTAATG  
TCCGAGGGCATGGAATGTTTCATTTTTGGTCAGAATCTCGACAGTAATG  
TCCGAGGGCATGGAATGTTTCATTTTTGGTAAAGAACTUGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTCGGTCAGAATCTUGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTCGGTCAGAATCTUGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTCGGTCAGAATCTUGACAGTAATG  
TCCGAGGGCATGGAATGTCTAATTTTTCGGTCAGAATCTUGACAGTAATG  
TCCGAGGGCATGGAATGTACCATTTTTGGTCAGAATCTTGGACAGTAATG  
\*\*\*\*\* \*\*

Citrullus lanatus

TCTCTTAGATTCTCCGGTTCGAAATACGGGAAAACCTCCATTCAATTCTC

Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_rpl5  
Lotus japonicus  
Millettia pinnata  
RRIM600\_rpl5  
RRIC110\_rpl5  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Silene latifolia  
RRIT251\_rpl5  
PB235\_rpl5  
BPM24\_rpl5  
Oryza sativa Japonica

TCTCTTTAGATTCTCCGGTCGAAATACGGGAAAACTCCATGCAATTCTC  
TCTCTATTAGATTTTTCCGGTCGAAATACGGAAAACTCCATTCAATTCTC  
TCTCTGTTAGATTTTTCCGGTCGAAATACGGAAAACTCCATTCAATTCTC  
TCTCTTTAGATTCTCCGGTCGAAATACGGGAAAACTCCATTCAATTCTC  
TCTCTGTTAGATTCTCTGGTCGAAATACGGGAAAACTCCATTCAATTCTC  
TCTCTGTTAGATTCTCCGGTCGAAATACGGGAAAACTCCATTCAATTCTC  
TCTCTTTAGATTCTCCGGTCGAAATACGGGAAAACTCCATTCAATTCTC  
TCTCTTTAGATTCTCTGGTCGAAATACGGGAAAACTCCATTCAATTCTC  
TCTCTTTAGATTCTCTGGTCGAAATACGGGAAAACTCCATTCAATTCTC  
TCTCTTTAGATTCTCTGGTCGAAATACGGGAAAACTCCATTCAATTCTC  
TCTCTTTAGATTCTCCGGTCGAAATACGGGAAAACTCCATTCAATTCTC  
TCTCTTTAGATTCTCCGGTCGAAATACGGGAAAACTCCATTCAATTCTC  
TCTCTTTAGATTCTCCGGTCGAAATACGGGAAAACTCCATTCAATTCTC  
TCTCTTTAGATTCTCCGGTCGAAATACGGGAAAACTCCATTCAATTCTC  
TCTATGTTAGATTCTCCGGTCGAAATATGGGAAAACTCCATCAAATTCTT  
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Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_rpl5  
Lotus japonicus  
Millettia pinnata  
RRIM600\_rpl5  
RRIC110\_rpl5  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Silene latifolia  
RRIT251\_rpl5  
PB235\_rpl5  
BPM24\_rpl5  
Oryza sativa Japonica

GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACAGAGTTTTGCTCATTCTCCCGGAACTAGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
GATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
TATGGAAACGGAGTTTTGCGAATTCTCCCGGAACTGGAAGATCATTTCG  
\*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\*

Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_rpl5  
Lotus japonicus  
Millettia pinnata  
RRIM600\_rpl5  
RRIC110\_rpl5  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Silene latifolia  
RRIT251\_rpl5  
PB235\_rpl5  
BPM24\_rpl5  
Oryza sativa Japonica

AGATCTTCGAACATATTCTAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTATAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTAGAGGGTTCAATGTGACTATTATCACCTCGGCC  
AGATCTTCGAACATATTAGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAACATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
AGATCTTCGAGCATATTGAGGGTTCAATGTGACTATTGTCACCTCGGCC  
\* \*\* \* \*\* \* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\*

Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_rpl5  
Lotus japonicus

AACACACAAGATGAGACTTTACUACUGTGGAGCGGCTTTTTGCAAAAAGA  
AACACACAAGATGAGACTTTACUACUGTGGAGCGGCTTTTTGCAAAAAGA  
AACACACAAGATGAGACTTTACUACTGTGGAGCGGCTTTTTGCAAAAAGA  
AACACACAAGATGAGACTTTACUACTGTGGAGCGGCTTTTTGCAAAAAGA  
AACACACAAGATGAGACTTTACUACUGTGGAGCGGCTTTTTGCAAAAAGA  
AACACACAAGATGAGACTTTACUACUGTGGAGCGGCTTTTTGCAAAAAGA

Milletia pinnata  
RRIM600\_rpl5  
RRIC110\_rpl5  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Silene latifolia  
RRIT251\_rpl5  
PB235\_rpl5  
BPM24\_rpl5  
Oryza sativa Japonica

AACACACAAGATGAGACTTTACUACUGTGGAGCGGCTTTTTGCAAAAAGA  
AACACACAAGATGAGACTTTACNACNGTGGAGCGGCTTTTTTCAAAAAGA  
AACACACAAGATGAGACTTTACUACUGTGGAGCGGCTTTTTTCAAAAAGA  
AACACACAAGATGAGACTTTACTACUGTGGAGCGGCTTTTTGCAAAAAGA  
AACACACAAGATGAGACTTTACTACUGTGGAGCGGCTTTTTGCAAAAAGA  
AACACACAAGATGAGACTTTACTACUGTGGAGCGGCTTTTTGCAAAAAGA  
AACACACAAGATGAGACTTTACTATUGTGGAGCGGCTTTTTGCAAAAAGA  
AACACACAAGATGAGACTTTACNACNGTGGAGCGGCTTTTTTCAAAAAGA  
AACACACAAGATGAGACTTTACUACUGTGGAGCGGCTTTTTTCAAAAAGA  
AACACACAAGATGAGACTTTACUACUGTGGAGCGGCTTTTTTCAAAAAGA  
AATACAAAAGATGAGACTTTACTACTGTGGAGCGGCTTTTTGCTAAAAGA  
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Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_rpl5  
Lotus japonicus  
Milletia pinnata  
RRIM600\_rpl5  
RRIC110\_rpl5  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Silene latifolia  
RRIT251\_rpl5  
PB235\_rpl5  
BPM24\_rpl5  
Oryza sativa Japonica

TGAGGGGGAAACTCAGTAAGAT--GTTGGAGAAGCGAAATATAC--GAGA  
TGAGGGGGAAACTCAGTAAGA-----GGAGAAGCTAAATATACACGAGA  
TGAGGGGGAAACTCAGTAAGA--TGTCGTAGAAGCAAATAGTA--GAGA  
TGAGGGGGAAACTCAGTAAGA--TGTCGGAGAAGCAAATAGTA--GAGA  
TGAGGGGGAAAGTCAGTAA-----  
TGAGGGGAGAAACTCAGTAAGAGATGTCGGAGAAGCGAAATATAC--GAGA  
TGAGGGGAGAAACTCAGTAAGAGATGTCGGAGAAGCGAAATATAC--GAGA  
TGAGGGGGAAAGTCAGTAA-----  
TGAGGGGGAAAGTCAGTAA-----  
TGAGGGGAGAAACTCAGTAAGA--TGTCGGAAAATCGAAATATAC--GAGA  
TGAGGGGAGAAACTCAGTAAGA--TGTCGGAAAATCGAAATATAC--GAGA  
TGAGGGGAGAAACTCAGTAAGA--TGTCGGAAAATCGAAATATAC--GAGA  
TGAGGG-----TCAGTAAGA--TGTCGGAAAAGCTAAATATAC--GAGA  
TGAGGGGGAAAGTCAGTAA-----  
TGAGGGGGAAAGTCAGTAA-----  
TGAGGGGGAAAGTCAGTAA-----  
TGAGGGGGAAACTAAGTAAGA--TGTCGGAGAAGCGAAATATAC--GAGA  
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Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_rpl5  
Lotus japonicus  
Milletia pinnata  
RRIM600\_rpl5  
RRIC110\_rpl5  
Beta vulgaris maritima  
Beta vulgaris vulgaris  
Beta macrocarpa  
Silene latifolia  
RRIT251\_rpl5  
PB235\_rpl5  
BPM24\_rpl5  
Oryza sativa Japonica

TCACAAACGTAGATTGCTCGCGGCTAAATATGAATTGAGAC-GAAAGCTT  
TCACAAACGTAGATTGCTCGCGGCTAAATATGAATTGAGAC-GAAAGCTT  
TCACAAACGTAGATTGCTCGCGGCTAAATTTGAATTGAGAC-GAAAGCTT  
TCACAAACGTAGATTGCTCGCGGCTAAATTTGAATTGAGAC-GAAAGCTT  
-----  
TCACAAACGCAGATTGCTCGCGGCTAAATATGAATTGAGAC-GAAAGCTT  
TCACAAACGCAGATTGCTCGCGGCTAAATATGAATTGAGAC-GAAAGCTT  
-----  
TCACAAA----CATTGCTCGCAGCTAAAAGTAAAAGACGTTAGAAAAGCTT  
TCACAAA----CATTGCTCGCAGCTAAAAGTAAAAGACGTTAGAAAAGCTT  
TCACAAA----CATTGCTCGCAGCTAAAAGTAAAAGACGTTAGAAAAGCTT  
TCACGTA----GATTGCTCGCAGCTAAAAGTAAAAGACGAAAAGCTTGCTT  
-----  
-----  
-----  
TCACAAACGTAGATTGCTCGCGGCTAAATATGAATTGAGAC-GAAAGCTT

Citrullus lanatus  
Cucurbita pepo  
Arabidopsis thaliana  
Brassica napus  
RRII105\_rpl5  
Lotus japonicus  
Milletia pinnata  
RRIM600\_rpl5  
RRIC110\_rpl5  
Beta vulgaris maritima  
Beta vulgaris vulgaris

TATTTAT-----  
GATTTAGAT---  
TATAAAG-----  
TATAAAG-----  
-----  
TATAAAG-----  
TATAA-----  
-----  
-----  
TTTGTAAGATC  
TTTGTAAGATC

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Beta macrocarpa          TTTGTAAAGATC
Silene latifolia        TCTAAAGCCTT-
RRIT251_rpl5           -----
PB235_rpl5             -----
BPM24_rpl5             -----
Oryza sativa Japonica  TAGAATTTTT--

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**rps12 multiple sequence alignment**

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Arabidopsis thaliana  - - - - ATU GGGAGTAA - - - - AGTGATAGGGCACAAAATGGGGGGA - - AAA
Brassica napus       - - - - ATU GGGAGTAA - - - - AGTGATAGGGCAAAAAATGGGGGGGGGAAA
RRIC110_rps12       -----
Oryza sativa Japonica - CGGATU GGGAGTAACCACTAGTGAAAGGGCAAA - - - - GGGGGGA - - AGG
Zea mays mays        - - - - GATU GGGAGTAACCACTAGTGAAAGGGCTAA - - - - GGGGGGA - - AGG
PB235_rps12         -----
Beta macrocarpa     - - - - - TU GGGAGTAATCACTAGTGATAGGGCAAAATAGGGGGGA - - AGG
Beta vulgaris maritima - - - - - TU GGGAGTAATCACTAGTGATAGGGCAAAATAGGGGGGA - - AGG
Beta vulgaris vulgaris - - - - - TU GGGAGTAATCACTAGTGATAGGGCAAAATAGGGGGGA - - AGG
Citrullus lanatus   - - - - - CGGGAGTAATTACTAGTGAGAGGGCAAAAGAGGGGGGA - - AGG
Cucurbita pepo     - - - - - GAGTAATCACTAACTAGTGAGAGGGCAAAAGAGGGGGGA - - AGG
Lotus japonicus     - - - - - TU GGGAGTAATCACTAGTGATAGGGCAAAATAGGGAGGA - - AGG
Millettia pinnata   - - - - - TU GGGAGTAATCACTAGTGATAGGGCAAAATAGGGAGGA - - AGG
RRII105_rps12      -----
RRIT251_rps12      -----
BPM24_rps12        -----
Cycas taitungensis TCGGATTGGGAGTAACC - - - - - TGATAGGGCAACAATCGGGGGGG - - - - A
RRIM600_rps12      -----
Huperzia squarrosa - - - - - - - - - AAGCCA - - ATTCATGGGCGATTCTATTGGCCAACGGCCAAA

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Arabidopsis thaliana  AGAAAGGAAAGAGAATAATGCCACGTTTAAATCAATTGATTCGTCATGGT
Brassica napus       AGAAAGGAAAGAGAATAATGCCTACGTTTAAATCAATTGATTCGTCATGGT
RRIC110_rps12       - - - - - ATGCCTACATTAAATCAATTGATTCGTCATGGT
Oryza sativa Japonica ACATAGGAAAGAG - - GGATGCCTACAAAAATCAATTGATTCGTCATGGT
Zea mays mays        ACATAGGAAAGAG - - GGATGCCTACAAAAATCAATTGATTCGTCATGGT
PB235_rps12         - - - - - ATGCCTACATTAAATCAATTGATTCGTCATGGT
Beta macrocarpa     ACAAAGGAAAGAG - - CGATGCCTACAATAAATCAATTGATTCGTCATGGT
Beta vulgaris maritima ACAAAGGAAAGAG - - CGATGCCTACAATAAATCAATTGATTCGTCATGGT
Beta vulgaris vulgaris ACAAAGGAAAGAG - - CGATGCCTACAATAAATCAATTGATTCGTCATGGT
Citrullus lanatus   ACAAAGGAAAGAG - - CGATGCCTACATTAAATCAATTGATTCGTCATGGT
Cucurbita pepo     ACAAAGGAAAGAG - - CGATGCCACATTAAATCAATTGATTCGTCATGGT
Lotus japonicus     ACAAAGGAAAGAG - - CGATGCCTACATTAAATCAATTGATTCGTCATGGT
Millettia pinnata   ACAAAGGAAAGAG - - CGATGCCTACATTAAATCAATTGATTCGTCATGGT
RRII105_rps12      - - - - - ATGCCTACATTAAATCAATTGATTCGTCATGGT
RRIT251_rps12      - - - - - ATGCCTACATTAAATCAATTGATTCGTCATGGT
BPM24_rps12        - - - - - ATGCCTACATTAAATCAATTGATTCGTCATGGT
Cycas taitungensis AGGACGGAAAGAG - - CGATGCCTACATCGAATCAATCGATTCGTCATGGT
RRIM600_rps12      - - - - - ATGCCTACATTAAATCAATTGATTCGTCATGGT
Huperzia squarrosa  AATAAAGTAAGTGAAATATGCCTACAATTAATCAAATTATACGTAATGGT

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Arabidopsis thaliana  AGAGAAGAAAAACGGCGCACGGACCGTACTCGAGCTTTGGATAAATGTCC
Brassica napus       AGAGAAGAAAAACGGCGCACGGACCGTACTCGAGCTTTGGATAAATGTCC
RRIC110_rps12       AGAGAAGAAAAACGGCGCACGGACCGTACTCGAGCTTUGGATCAATGTCC
Oryza sativa Japonica AGAGAAGAAAAACAGCGCACGGACCGTACTCGAGCTTCCGGATCAATGTCC
Zea mays mays        AGAGAAGAAAAACGGCGCACGGACCGTACTCGAGCTTUGGATCAATGTCC
PB235_rps12         AGAGAAGAAAAACGGCGCACGGACCGTACTCGAGCTTUGGATCAATGTCC
Beta macrocarpa     AGAGAAGAAAAACGGCGCACGGACCGTACTCGAGCTTUGGATCAATGTCC
Beta vulgaris maritima AGAGAAGAAAAACGGCGCACGGACCGTACTCGAGCTTUGGATCAATGTCC
Beta vulgaris vulgaris AGAGAAGAAAAACGGCGCACGGACCGTACTCGAGCTTUGGATCAATGTCC
Citrullus lanatus   AGAGAAGAAAAACGACGCACTGACCGTACTCGAGCTTUGGATCAATGTCC

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Beta vulgaris vulgaris	AGAGGCAGATCAAAATATGGTGCAGAAAAACCCAA--ATCGA-TATGAAT
Citrullus lanatus	AGAGGCAGATCTAAATATGGTGCAGAAAAACCCAA--ATAGA-GAGGAAT
Cucurbita pepo	AGAGGAAGATCTAAATATGGTGCAGAAAAACCTAA--ATCGA-TATGAAT
Lotus japonicus	AGAGGCAGATCAAAATATGGTGCAGAAAAACCCAA--ATCGA-TATGAAT
Millettia pinnata	AGAGGCAGATCCAAATATGGTGCAGAAAAACCCAA--ATCGA-TATGAAT
RRII105_rps12	AGAGGCAGATCAAAATATGGTGCAGAAAAACCCAA--ATCGA-TATGA--
RRIT251_rps12	AGAGGCAGATCAAAATATGGTGCAGAAAAACCCAA--ATCGA-TATGA--
BPM24_rps12	AGAGGCAGATCAAAATATGGTGCAGAAAAACCCAA--ATCGA-TATGA--
Cycas taitungensis	AGGGGCAGATCTAAATATGGTGCAGAAAGAGACCCAA--ATCGA-TAU <sup>U</sup> GAAT
RRIM600_rps12	AGAGGCAGATCAAAATATGGTGCAGAAAAACCCAA--ATCGA-TATGA--
Huperzia squarrosa	CGAGGCAGATCTAAATATGGTACGAAAAACCCAAAGGATCAAATATGAAT

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Arabidopsis thaliana	GGA-AGATGCCTCTGGAAC TAGT---ATCGGT CAGTCGGT GGAACAATCA
Brassica napus	GGA-AGATGCCTCTGGAAC TAGTT--ATCGGTAAGTCTTTT-AGTAAGCG
RRIC110_rps12	-----
Oryza sativa Japonica	GGA-AGATGCCTCTGGAAC TTTTTGGTTATTTTGGGT---CCAGATGAAC
Zea mays mays	GGA-AGATGCCTCTGGAAC TTATTGGTTATTTTGGGGGGCGATATGGAA
PB235_rps12	-----
Beta macrocarpa	GGA-AGATGCCTCTT----CTCTT---TGTCTTGGTCCAGGGAACC
Beta vulgaris maritima	GGA-AGATGCCTCTT----CTCTT---TGTCTTGGTCCAGGGAACC
Beta vulgaris vulgaris	GGA-AGATGCCTCTT----CTCTT---TGTCTTGGTCCAGGGAACC
Citrullus lanatus	GGA-AGATGCCTCTTTCACTTGT---TTTCTCGTCCAGGGAACA
Cucurbita pepo	GGA-AGATGCCTCTTTCACTTCTT---TTTCTCGGTCAGTCCAGGGAAG
Lotus japonicus	GGA-GGATGCCTCTGGAAC TTCTT---TTTCTCGTCCAGGAGAGGTACGA
Millettia pinnata	GGA-GGATGCCTCTGGAAC TTCTT---TTTCTCGTCCAGGAGAGGTACGA
RRII105_rps12	-----
RRIT251_rps12	-----
BPM24_rps12	-----
Cycas taitungensis	GAA-AGACGAAAAACCAAAGATTCTAATAAATACTTGATCTTAATCAATG
RRIM600_rps12	-----
Huperzia squarrosa	TCATGGGTAAAATCATCGAATTTACGCTGTGTTTTGGTTCATACTTTGA

Arabidopsis thaliana	CAACGTTACG---
Brassica napus	TA-TATAAA----
RRIC110_rps12	-----
Oryza sativa Japonica	GCAAGTCG-----
Zea mays mays	GCAGCTA-----
PB235_rps12	-----
Beta macrocarpa	CGCGTTAGGCCA-
Beta vulgaris maritima	CGCGTTAGGCCA-
Beta vulgaris vulgaris	-GCGTTAGGCCAA
Citrullus lanatus	A-----
Cucurbita pepo	GGAACAAC-----
Lotus japonicus	AGTCACTC-----
Millettia pinnata	AGTCACTC-----
RRII105_rps12	-----
RRIT251_rps12	-----
BPM24_rps12	-----
Cycas taitungensis	TGAATAT-----
RRIM600_rps12	-----
Huperzia squarrosa	TGGGTT-----

#####  
**rps13 multiple sequence alignment**

Beta macrocarpa	---AGACAGGCCATTTATGATTCCAGCCTAGAAGACTAGTTAAAGGA--A
Beta vulgaris maritima	---AGACAGGCCATTTATGATTCCAGCCTAGAAGACTAGTTAAAGGA--A
Beta vulgaris vulgaris	-----ACAGGCCATTTATGATTCCAGCCTAGAAGACTAGTTAAAGGA--A
Citrullus lanatus	---AGACAACCTCATTTATGATTCCAGCCGAGAAGACTAGTAAAAGGA--A
Cucurbita pepo	-----AACTAATTTCTTATTCCAGCCTAGAAGACTAGTAAAAGGAGAA





Citrullus lanatus	TTACGCGGTCAACGAACTCATACTAATGCTAGGACTTGTTCGCAAG---
Cucurbita pepo	TTACGCGGTCAACGAACTCATACTAATGCTAGGACTTGTTCGCAAG---
RRII105_rps13	TTACGCGGTCAACGAACTCATACTAATGCTAGAACTTGTTCGCAAG---
RRIT251_rps13	TTACGCGGTCAACGAACTCATACTAATGCTAGAACTTGTTCGCAAG---
Oryza sativa Japonica	TTACGCGGTCAACGAACTCATACTAATGCAAGGACTGCTTCGCAAG---
Zea mays mays	TTACGCGGTCAACGAACTCATACTAATGCAAGGACTGCTTCGCAAG---
RRIC110_rps13	TTACGCGGTCAACGAACTCATACTAATGCTAGAACTTGTTCGCAAG---
RRIM600_rps13	TTACGCGGTCAACGAACTCATACTAATGCTAGAACTTGTTCGCAAG---
PB235_rps13	TTACGCGGTCAACGAACTCATACTAATGCTAGAACTTGTTCGCAAG---
BPM24_rps13	TTACGCGGTCAACGAACTCATACTAATGCTAGAACTTGTTCGCAAG---
Megaceros aenigmaticus	TTACGTGGTCAACGAACTCATACTAATGCTAAGACTTGTTCGCAAG---
Phaeoceros laevis	TTACGTGGTCAACGAACTCATACTAATGCTAAGACTTGTTCGCAAG---
Huperzia squarrosa	TTACGCGGTCAACGAACTCATACTAATGCTAAGACTTGTTCGCAAG---

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Beta macrocarpa	AA----TTCGAAATGAAAGAAGTCTACCGAA--GCCCTTGGTACTTGT
Beta vulgaris maritima	AA----TTCGAAATGAAAGAAGTCTACCGAA--GCCCTTGGTACTTGT
Beta vulgaris vulgaris	AA----TTCGAAATGAAAGAAGTCTACCGAA--GCCCTTGGTACTTGT
Citrullus lanatus	AA----TTCGAAATGAAATCAGTCTACCGAAA--GCCCTTGGTACTTGT
Cucurbita pepo	AA----TTCGAAATGAAATCAGTCTACCGAAAAAGCCCTTGGTACTTGT
RRII105_rps13	AA----TTCGAAATGA-----
RRIT251_rps13	AA----TTCGAAATGA-----
Oryza sativa Japonica	AA----TTCGAAATGAAAGAAGGCTACCGAAAGAAC---AAGCAACGGA
Zea mays mays	AA----TTCGAAATGAAAGAAGGCTACCGAAAGAAC---AAGCAACGGA
RRIC110_rps13	AA----TTCGAAATGA-----
RRIM600_rps13	AA----TTCGAAATGA-----
PB235_rps13	AA----TTCGAAATGA-----
BPM24_rps13	AA----TTCGAAATGA-----
Megaceros aenigmaticus	AAACGTTTTCGATCAATCAAC-----GAAGTTGATTGATGGTTACA
Phaeoceros laevis	AAACGTTTTCGATCAATCAAC-----GAAGTTGATTGATGGTTCA
Huperzia squarrosa	AAGGGTTTTCGATCAAAAAACTAAAAAAUGAGGTTGATTGATGGTTGCA

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Beta macrocarpa	CTGATCAATCATACTGATAGC-----
Beta vulgaris maritima	CTGATCAATCATACTGATAGC-----
Beta vulgaris vulgaris	CTGATCAATCATACTGATAGCTT-----
Citrullus lanatus	CGGATCAATCACACTGATAGC-----
Cucurbita pepo	CGGATCAATCACACAGATAGC-----
RRII105_rps13	-----
RRIT251_rps13	-----
Oryza sativa Japonica	TTTCGCGCTCATCCCTTGCGCCTG-----
Zea mays mays	TTGAGCGCTCATCCCTTGCGCC-----
RRIC110_rps13	-----
RRIM600_rps13	-----
PB235_rps13	-----
BPM24_rps13	-----
Megaceros aenigmaticus	AGAATTCATCATCCACAATAATCGAAGCGCAAAGCAATGTGTT
Phaeoceros laevis	ACAATTCATCATCCATCATAATCGAAGCGCAAAGCAATGTGTT
Huperzia squarrosa	ACGATTCATCATTCGCAATAATGAAGG---AAAGCGAAG---

#####  
**rps1 multiple sequence alignment**

RRII105_rps1	-----
PB235_rps1	-----
RRII105_rps1	-----
BPM24_rps1	-----
RRIM600_rps1	-----
RRIT251_rps1	-----
Citrullus lanatus	CAGCAGCTTAGCTTAGTAGCTCAACTCTT--TCGACTGGCGTGACGCTGC
Cucurbita pepo	CAACA-CTTAGCTTAGTAGCTCAACTCTT--TCGACTGGCGTGACGCTGC
Millettia pinnata	-----CTGGATGAGAACTCCACTACTTAATCTACTGGCGTGCTACT

Oryza sativa Japonica

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-----AT
RRIC110_rps1 -----AT
PB235_rps1 -----AT
RRII105_rps1 -----AT
BPM24_rps1 -----AT
RRIM600_rps1 -----AT
RRIT251_rps1 -----AT
Citrullus lanatus TGGATGCTTCTGATCAATAG - - - - GAAGAGGAGGAAAAAAAAAGCTTAT
Cucurbita pepo TGGATGCTTCTGATCAATAG - - - - GAAGAGGAGGCAAAACAA - GCTTAT
Millettia pinnata TGGATGCTTCTGATCAATAGAACAGGAAGAGGAGGAAAAAAAA - GCTTAT
Oryza sativa Japonica -----

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RRIC110_rps1 GACGAGCATCTATTTGAATCGATCATTTCCAAGAGCTAATTCCAGTTTTT
PB235_rps1 GACGAGCATCTATTTGAATCGATCATTTCCAAGAGCTAATTCCAGTTTTT
RRII105_rps1 GACGAGCATCTATTTGAATCGATCATTTCCAAGAGCTAATTCCAGTTTTT
BPM24_rps1 GACGAGCATCTATTTGAATCGATCATTTCCAAGAGCTAATTCCAGTTTTT
RRIM600_rps1 GACGAGCATCTATTTGAATCGATCATTTCCAAGAGCTAATTCCAGTTTTT
RRIT251_rps1 GACGAGCATCTATTTGAATCGATCATTTCCAAGAGCTAATTCCAGTTTTT
Citrullus lanatus GATGAGCATCTATTTGAGTCGATCATTTCCAAGATCTAATTCCAGTTTTT
Cucurbita pepo GATGAGCATCTATTTGAGTCGATCATTTCCAAGATCTAATTCTAGTTTTT
Millettia pinnata GATGAGCATCTATTTGAGTCGATCATTTCCAAGATCTAATTCCAGTTTCT
Oryza sativa Japonica -----GATCTAATTCTAGTTTTCT
** ***** ** ** *

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RRIC110_rps1 CCTTATTCCGAGGTAACGCCTTACAATCTTCAGTCTTACGCTTA-----
PB235_rps1 CCTTATTCCGAGGTAACGCCTTACAATCTTCAGTCTTACGCTTA-----
RRII105_rps1 CCTTATTCCGAGGTAACGCCTTACAATCTTCAGTCTTACGCTTA-----
BPM24_rps1 CCTTATTCCGAGGTAACGCCTTACAATCTTCAGTCTTACGCTTA-----
RRIM600_rps1 CCTTATTCCGAGGTAACGCCTTACAATCTTCAGTCTTACGCTTA-----
RRIT251_rps1 CCTTATTCCGAGGTAACGCCTTACAATCTTCAGTCTTACGCTTA-----
Citrullus lanatus TCTTATGTAGTGGAAACGCCTTACAATCTGAAGTTTTACGCTTA-----
Cucurbita pepo TCTTACGTAGTGGAAACGCCTTACAATCTTCAGTTTTACGCTTA-----
Millettia pinnata TCTTATGTAGTGGAAAGGCCTTACAATCTGAAGTTTTACGCTTA-----
Oryza sativa Japonica TATTATGTAGTGGAAACGCCTCACAATCTTCAGTTTTACGTTACGCTTA
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RRIC110_rps1 AGGGGTA AAAATGTTCTTGTTGGATGCAGGACTTGGGACCCCATCATTTG
PB235_rps1 AGGGGTA AAAATGTTCTTGTTGGATGCAGGACTTGGGACCCCATCATTTG
RRII105_rps1 AGGGGTA AAAATGTTCTTGTTGGATGCAGGACTTGGGACCCCATCATTTG
BPM24_rps1 AGGGGTA AAAATGTTCTTGTTGGATGCAGGACTTGGGACCCCATCATTTG
RRIM600_rps1 AGGGGTA AAAATGTTCTTGTTGGATGCAGGACTTGGGACCCCATCATTTG
RRIT251_rps1 AGGGGTA AAAATGTTCTTGTTGGATGCAGGACTTGGGACCCCATCATTTG
Citrullus lanatus AGGGAAGAAATGTTCTTGTTGGATGCAGGACCTGGGACCCCAAGATTTG
Cucurbita pepo AGGGAAGAAATGTTCTTGTTGGATGCAGGACCTGGGACCCCAAGATTTG
Millettia pinnata GGGGAAGAAATGTTCTTGTTGGATGCAGGACU TGGGACCCCAAGATTTG
Oryza sativa Japonica AGGGAAGAAATGTTCTTGTTGGATGCAGGCC TTGGTACCCCAAAATTTG
*** ***** ** * ** * ** * ** * ** *

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RRIC110_rps1 TATGCAAGATGAGCTTACAGGAGTGCCAAAAAACCGAGCCACCAGGTTTTG
PB235_rps1 TATGCAAGATGAGCTTACAGGAGTGCCAAAAAACCGAGCCACCAGGTTTTG
RRII105_rps1 TATGCAAGATGAGCTTACAGGAGTGCCAAAAAACCGAGCCACCAGGTTTTG
BPM24_rps1 TATGCAAGATGAGCTTACAGGAGTGCCAAAAAACCGAGCCACCAGGTTTTG
RRIM600_rps1 TATGCAAGATGAGCTTACAGGAGTGCCAAAAAACCGAGCCACCAGGTTTTG
RRIT251_rps1 TATGCAAGATGAGCTTACAGGAGTGCCAAAAAACCGAGCCACCAGGTTTTG
Citrullus lanatus TATGCAAGATGAGCCTACAGGAGTGCCAATCAACCGAGCCACCAGGTTTTG
Cucurbita pepo TATGCAAGATGAGCCTACAGGAGTGCCAATCAACCGAGCCGCCAGGTTTTG
Millettia pinnata TATGCAAGATGAGCCTACAGGAGTGCCAATCAACCGAGCCACCAGGTTTTG
Oryza sativa Japonica TATGCAAGATGAGCTTACAGGACTGCCAATCAAGCGAGCCACCAGGTTTTG
***** ** * ** * ** * ** * ** *

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RRIC110\_rps1 AGAATAAAGTGGGTTUCCTGGGTAAATCAATGATCAAAGAGCGAGCAGCC  
PB235\_rps1 AGAATAAAGTGGGTTUCCTGGGTAAATCAATGATCAAAGAGCGAGCAGCC  
RRII105\_rps1 AGAATAAAGTGGGTTUCCTGGGTAAATCAATGATCAAAGAGCGAGCAGCC  
BPM24\_rps1 AGAATAAAGTGGGTTUCCTGGGTAAATCAATGATCAAAGAGCGAGCAGCC  
RRIM600\_rps1 AGAATAAAGTGGGTTNCCTGGGTAAATCAATGATCAAAGAGCGAGCAGCC  
RRIT251\_rps1 AGAATAAAGTGGGTTUCCTGGGTAAATCAATGATCAAAGAGCGAGCAGCC  
Citrullus lanatus AGAATAAGGTGGGATUCCTGG-----  
Cucurbita pepo AGAATAAGGTGGGATUCCTGG-----  
Millettia pinnata AGAATAAGGTGGGATCCCTGG-----  
Oryza sativa Japonica AGAATAAGGTGGGATCCAAGA-----  
\*\*\*\*\* \*\*\*\*\* \* \* \*

RRIC110\_rps1 GCCAGGTTGAAGAAAAAGGATGTCGCCTGGTATTTTAAGAATAAAGTGAC  
PB235\_rps1 GCCAGGTTGAAGAAAAAGGATGTCGCCTGGTATTTTAAGAATAAAGTGAC  
RRII105\_rps1 GCCAGGTTGAAGAAAAAGGATGTCGCCTGGTATTTTAAGAATAAAGTGAC  
BPM24\_rps1 GCCAGGTTGAAGAAAAAGGATGTCGCCTGGTATTTTAAGAATAAAGTGAC  
RRIM600\_rps1 GCCAGGTTGAAGAAAAAGGATGTCGCCTGGTATTTTAAGAATAAAGTGAC  
RRIT251\_rps1 GCCAGGTTGAAGAAAAAGGATGTCGCCTGGTATTTTAAGAATAAAGTGAC  
Citrullus lanatus -----  
Cucurbita pepo -----  
Millettia pinnata -----  
Oryza sativa Japonica -----

RRIC110\_rps1 CGCCTGCTTTTTTAAGAATAAAGTGGCCGGTGAATCAATGATCAAAGAGC  
PB235\_rps1 CGCCTGCTTTTTTAAGAATAAAGTGGCCGGTGAATCAATGATCAAAGAGC  
RRII105\_rps1 CGCCTGCTTTTTTAAGAATAAAGTGGCCGGTGAATCAATGATCAAAGAGC  
BPM24\_rps1 CGCCTGCTTTTTTAAGAATAAAGTGGCCGGTGAATCAATGATCAAAGAGC  
RRIM600\_rps1 CGCCTGCTTTTTTAAGAATAAAGTGGCCGGTGAATCAATGATCAAAGAGC  
RRIT251\_rps1 CGCCTGCTTTTTTAAGAATAAAGTGGCCGGTGAATCAATGATCAAAGAGC  
Citrullus lanatus -----ATCTAGTGGCCGGTGAATCACTGATCAAAGATC  
Cucurbita pepo -----ATCTAGTGGCCGGTGAATCACTGATCAAAGAGC  
Millettia pinnata -----ATCTAGTGGCCGGTGAATCACTGATCAAAAAGA  
Oryza sativa Japonica -----ATGTAGTGGCTGGTGAATCACTGATCAAAAAGC  
\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\*

RRIC110\_rps1 ATATTTTGAGAGATTCTTCATCGATCTAGTGGCCGGTGAATCAATGATC  
PB235\_rps1 ATATTTTGAGAGATTCTTCATCGATCTAGTGGCCGGTGAATCAATGATC  
RRII105\_rps1 ATATTTTGAGAGATTCTTCATCGATCTAGTGGCCGGTGAATCAATGATC  
BPM24\_rps1 ATATTTTGAGAGATTCTTCATCGATCTAGTGGCCGGTGAATCAATGATC  
RRIM600\_rps1 ATATTTTGAGAGATTCTTCATCGATCTAGTGGCCGGTGAATCAATGATC  
RRIT251\_rps1 ATATTTTGAGAGATTCTTCATCGATCTAGTGGCCGGTGAATCAATGATC  
Citrullus lanatus AAATTTTGAGAGATTCTTCATCGATCTAGTGGCCGGTGAATCACTGATC  
Cucurbita pepo CTATTTTGAGAGATTCTTCATCGATCTAGTGGCCGGTGAATCACTGATC  
Millettia pinnata AGATTTTGAGAGATTCTTCATCGATCTAGTGGCCGGTGAATCACTGATC  
Oryza sativa Japonica GGATTTGAGAGATTCTTCATCGATCTAGTGGCCGGTGAATCACTGATC  
\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\*

RRIC110\_rps1 AAAGAGCGAGCAGCCGCCAGGTTTAATGATTTGGTGGGATCCACAGATGT  
PB235\_rps1 AAAGAGCGAGCAGCCGCCAGGTTTAATGATTTGGTGGGATCCACAGATGT  
RRII105\_rps1 AAAGAGCGAGCAGCCGCCAGGTTTAATGATTTGGTGGGATCCACAGATGT  
BPM24\_rps1 AAAGAGCGAGCAGCCGCCAGGTTTAATGATTTGGTGGGATCCACAGATGT  
RRIM600\_rps1 AAAGAGCGAGCAGCCGCCAGGTTTAATGATTTGGTGGGATCCACAGATGT  
RRIT251\_rps1 AAAGAGCGAGCAGCCGCCAGGTTTAATGATTTGGTGGGATCCACAGATGT  
Citrullus lanatus AAAGAGCGAGCTGCCGCCAGGTTTAATGATTTGGTGGGATCCACAGATGT  
Cucurbita pepo AAAGAGCGAGCAGCCGCCGGTTTAATGATTTGGTGGGATCCACAGATGT  
Millettia pinnata AAAGAGCGAGCAGCCGCCAGGTTTAATGATTTGGTGGGATCCACAGATGT  
Oryza sativa Japonica AAAGAGCGAGCAGCCGCCAGGTTTAATGATTTTGTGGGATUCCTGGATGT  
\*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*

RRIC110\_rps1 AGTGGCTGGTGAACCGC---TTCTTCTCCACGAAGATTCATACAAATCC

PB235\_rps1  
RRII105\_rps1  
BPM24\_rps1  
RRIM600\_rps1  
RRIT251\_rps1  
Citrullus lanatus  
Cucurbita pepo  
Millettia pinnata  
Oryza sativa Japonica

AGTGGCTGGTGAACCGC --- TTCTTCTTCCACGAAGATTCATACAAATCC  
AGTGGCTGGTGAACCGC --- TTCTTCTTCCACGAAGATTCATACAAATCC  
AGTGGCTGGTGAACCGC --- TTCTTCTTCCACGAAGATTCATACAAATCC  
AGTGGCTGGTGAACCGC --- TTCTTCTTCCACGAAGATTCATACAAATCC  
AGTGGCTGGTGAACCGC --- TTCTTCTTCCACGAAGATTCATACAAATCC  
AGTGGCTGGTGAACCGCTTTTTTCTTCTTCCACGAAGATTCAGACAAAACC  
AGTGGCTGGTGAACCGCTTTTTTATTCTTCCACGAAGATTCAGACAAAACC  
AGTGGCTGGTGAACCGCTTCTTCTTCTTCCACGAAGATTCAGACAAAACC  
AGCGGCTGGCGAACCGC --- TTCTTCTTCCACAAAGATTCAGACAAAACC  
\*\* \*\*\*\*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*

RRIC110\_rps1  
PB235\_rps1  
RRII105\_rps1  
BPM24\_rps1  
RRIM600\_rps1  
RRIT251\_rps1  
Citrullus lanatus  
Cucurbita pepo  
Millettia pinnata  
Oryza sativa Japonica

GAGCTTGGATGGAACGTATAAAGATTTGGCGAACGAAAAAAAAAGGTCAAA  
GAGCTTGGATGGAACGTATAAAGATTTGGCGAACGAAAAAAAAAGGTCAAA  
GAGCTTGGATGGAACGTATAAAGATTTGGCGAACGAAAAAAAAAGGTCAAA  
GAGCTTGGATGGAACGTATAAAGATTTGGCGAACGAAAAAAAAAGGTCAAA  
GAGCTTGGATGGAACGTATAAAGATTTGGCGAACGAAAAAAAAAGGTCAAA  
GAGCTTGGATGGAACGTATAAAGATTTGGCGAACGAAAAAAAAAGGTCAAA  
GAGCTTGGATGGAACGTAAACAAGATTTGGCAAACGAATACAAAAGTCAAA  
GAGCTTGGATGGAACGTAAACAAGATTTGGCAAACGAATACAAAAGTCAAA  
GAGCTTGGATGGAACGTAAACAAGATTTGGCAAACGAATACAAAAGTCAAA  
GAGCTTGGATGGAACGTAAACAAGATTTGGCAAACGAATACAAAAGTCAAA  
GAGCTTGGATAGAACTGAAGAAGATTTGGCAAACGAAGAAAAAGGTCAAA  
\*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \* \*\* \* \*\* \* \*\*

RRIC110\_rps1  
PB235\_rps1  
RRII105\_rps1  
BPM24\_rps1  
RRIM600\_rps1  
RRIT251\_rps1  
Citrullus lanatus  
Cucurbita pepo  
Millettia pinnata  
Oryza sativa Japonica

GGCTTTTATATTAAGAAAATCAAGGGAGGTTATTCAGTAGCCATCGCAGG  
GGCTTTTATATTAAGAAAATCAAGGGAGGTTATTCAGTAGCCATCGCAGG  
GGCTTTTATATTAAGAAAATCAAGGGAGGTTATTCAGTAGCCATCGCAGG  
GGCTTTTATATTAAGAAAATCAAGGGAGGTTATTCAGTAGCCATCGCAGG  
GGCTTTTATATTAAGAAAATCAAGGGAGGTTATTCAGTAGCCATCGCAGG  
GGCTTTTATATTAAGAAAATCAAGGGAGGTTATTCAGTAGCCATCGCAGG  
GGCTTTATTATTGAGAAAGTCAAAGGAGGTTATTCAGTAGCCATCGCGGG  
GGCTTTATTATTGAGAAAGTCAAAGGAGGTTATTCAGTAGCCATCGCGGG  
GGCTTTATTCTTAATAAAGTAAAAGGAGGTTATTUAGTAGCCATCGCGGG  
GGGTTTCGTATTAATAAAGTCAAAGGAGGTTATTUAGTAGCCATCGCAGG  
\*\* \*\* \* \*\* \* \*\* \* \*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\*

RRIC110\_rps1  
PB235\_rps1  
RRII105\_rps1  
BPM24\_rps1  
RRIM600\_rps1  
RRIT251\_rps1  
Citrullus lanatus  
Cucurbita pepo  
Millettia pinnata  
Oryza sativa Japonica

TTTCATTACTTTTCTTCCATTCCGTCCTCTCAA ----- AAGGAAAG  
TTTCATTACTTTTCTTCCATTCCGTCCTCTCAA ----- AAGGAAAG  
TTTCATTACTTTTCTTCCATTCCGTCCTCTCAA ----- AAGGAAAG  
TTTCATTACTTTTCTTCCATTCCGTCCTCTCAA ----- AAGGAAAG  
TTTCATTACTTTTCTTCCATTCCGTCCTCTCAA ----- AAGGAAAG  
TTTCATTACTTTTCTTCCATTCCGTCCTCTCAT ----- AAGGAAAA  
TTTCATTACTTTTCTTCCATTCCGTCCTCTCAT ----- AAGTCAAA  
TTTCATTACTTTTCTTCCATTCCGTTCTCACAAGAAAAGAAGGAAAA  
TTTCATTACTTTTCTTCCATTCCG --- CTAAAAA ----- AAAAAAAA  
\*\*\*\*\* \*\*\*\*\* \*\* \* \*\* \*\*

RRIC110\_rps1  
PB235\_rps1  
RRII105\_rps1  
BPM24\_rps1  
RRIM600\_rps1  
RRIT251\_rps1  
Citrullus lanatus  
Cucurbita pepo  
Millettia pinnata  
Oryza sativa Japonica

GAACATGGAAAAAG - GAATCGCGAAGGCGATGGCGAAAGATAATGGAAG  
GAACATGGAAAAAG - GAATCGCGAAGGCGATGGCGAAAGATAATGGAAG  
GAACATGGAAAAAG - GAATCGCGAAGGCGATGGCGAAAGATAATGGAAG  
GAACATGGAAAAAG - GAATCGCGAAGGCGATGGCGAAAGATAATGGAAG  
GAACATGGAAAAAG - GAATCGCGAAGGCGATGGCGAAAGATAATGGAAG  
GAACATGGAAAAAG - GAATCGCGAAGGCGATGGCGAAAGATAATGGAAG  
GGATATCGAATGATCGATTACCATTGAGAGGGGAGAGCATTAAACCC  
GGATATCGAATGAGAGATTACCATTGAGAGCATTAAAC --- CCAAAAAC  
AGATATCGAATGATCGATTACCATTGAGAGCATTAAAC --- CCCAAAAG  
GGATAGCGAATGATCGATTACCATTGATAGCTTTAAAC --- CCTAAAAG  
\* \* \*\* \* \*\* \* \* \* \* \*

RRIC110\_rps1  
PB235\_rps1  
RRII105\_rps1

GCGAAGGCAAATGGAAATGCAAAGGCGAGC - GC - TATTGAATGGTGCATT  
GCGAAGGCAAATGGAAATGCAAAGGCGAGC - GC - TATTGAATGGTGCATT  
GCGAAGGCAAATGGAAATGCAAAGGCGAGC - GC - TATTGAATGGTGCATT

BPM24_rps1	GCGAAGGCAAATGGAAATGCAAAGGCGAGC - GC - TATTGAATGGTCGATT
RRIM600_rps1	GCGAAGGCAAATGGAAATGCAAAGGCGAGC - GC - TATTGAATGGTCGATT
RRIT251_rps1	GCGAAGGCAAATGGAAATGCAAAGGCGAGC - GC - TATTGAATGGTCGATT
Citrullus lanatus	AACGAATATTGTGGTGTCTAAGAGTG - - - - GCAGATCAAACAAGAACTT
Cucurbita pepo	AACGAATATTGTGGTGTCTAAGAGTGAGTGGCGGATCAAACAAGAACTT
Millettia pinnata	GACGAATATTGTGGTGTCTAATCTTTTGT - GCATCTTTCTCCCATGCTT
Oryza sativa Japonica	GAGGGATATTGTGAT - - - - AATAGCG - - - - GCAGATCAAACAAGAACTT
	* * * * *

RRIC110_rps1	CAACATCGAGCGCTATGATC - - CCAAATGGATGAATATTGTGGTGTGCGCT
PB235_rps1	CAACATCGAGCGCTATGATC - - CCAAATGGATGAATATTGTGGTGTGCGCT
RRII105_rps1	CAACATCGAGCGCTATGATC - - CCAAATGGATGAATATTGTGGTGTGCGCT
BPM24_rps1	CAACATCGAGCGCTATGATC - - CCAAATGGATGAATATTGTGGTGTGCGCT
RRIM600_rps1	CAACATCGAGCGCTATGATC - - CCAAATGGATGAATATTGTGGTGTGCGCT
RRIT251_rps1	CAACATCGAGCGCTATGATC - - CCAAATGGATGAATATTGTGGTGTGCGCT
Citrullus lanatus	GATGAGCGAAATCCGCTGACGAAAAAAAAAAGAGCTTTTTTTTAAACAGC
Cucurbita pepo	GTCGGTCGAG - - CTGCTGA - - GCTCCGGAACCCATTTCTTCTTCACTGT
Millettia pinnata	TTCTTTGGTCAACAACCAA - - - - - GCACAACCTATTTATAATGAATTCAT
Oryza sativa Japonica	GATGAAAAAAAA - TAATAAATTATTAATAATCCGAAGCCCACCTTAATCCA

RRIC110_rps1	AUCAGCGGAAGATCAAAGAAGAAGAACTTGA - - - - -
PB235_rps1	AUCAGCGGAAGATCAAAGAAGAAGAACTTGA - - - - -
RRII105_rps1	AUCAGCGGAAGATCAAAGAAGAAGAACTTGA - - - - -
BPM24_rps1	AUCAGCGGAAGATCAAAGAAGAAGAACTTGA - - - - -
RRIM600_rps1	AUCAGCGGAAGATCAAAGAAGAAGAACTTGA - - - - -
RRIT251_rps1	ANCAGCGGAAGATCAAAGAAGAAGAACTTGA - - - - -
Citrullus lanatus	TCCTCTCCCTATCGGTGCGAGCTGCTTTGTTCTCTCCCTATCGGTCTGA
Cucurbita pepo	AACTGTAAACGAAGAA - - - - -
Millettia pinnata	CACTATAAAGGAGAAGTGAA - - - - -
Oryza sativa Japonica	TTTTGTTGAGGATCTTGCACTTATTCCGGCCC - - - - -

#####  
**rps4 multiple sequence alignment**

Arabidopsis thaliana	- - - - - GGACTTAGAAAAGTCCTAAAATATCTTTCTGACCATGG
Brassica napus	- - - - - GGGACTTAGAAAAGTCCTCAAATCTTTCTGACCATGG
Oryza sativa Japonica	- - - - - ACGATATGT
RRIM600_rps4	- - - - -
Citrullus lanatus	- - - - - CTTTGGCATAAAGATACCT
Cucurbita pepo	- - - - - AAGGAAGGATCTTTGGCATAAAGATACCA
PB235_rps4	- - - - -
RRIC110_rps4	- - - - -
Lotus japonicus	- - - - - TCTGTCTCCAAGACATCTCTCATGCCGTGC - - CAAGGCAGCG
Millettia pinnata	CTAAAGCGCTAACGCGCCTTATATTTTTAATTTTTTTTAGTAAAGCAAAG
BPM24_rps4	- - - - -
RRIT251_rps4	- - - - -
RRII105_rps4	- - - - -
Beta macrocarpa	- - - - -
Beta vulgaris vulgaris	- - - - -
Beta vulgaris maritima	- - - - -

Arabidopsis thaliana	TGTCAATAGCCCATACTTTTCAGTCTTTTTTTAAAAAGACAACGTGAAGAG
Brassica napus	TGTCAATAGCCCATACTTTTCAGTCTTTTTT - AAAAAGACAACGTGAAGAG
Oryza sativa Japonica	AGTAGCTCATCCTAATTGAAGTATTTCTTCTGGCGAGCGTTCCTTTCTT
RRIM600_rps4	- - - - -
Citrullus lanatus	TCTTATTATTATTAGAGAAAGGGGCAAGCCAAAACCAACTCCTAAAAAGT
Cucurbita pepo	GATTATTA - - GAGAGAGAAAGGGGCAAGGCAAAAACCAACTCCTAAAAAGT
PB235_rps4	- - - - -
RRIC110_rps4	- - - - -
Lotus japonicus	AAACCTTTCGCCCGCGAAAGCGGTAATCTCTTTCCCGTTCCCGGCTTTT



Millettia pinnata CAACCTTTCGCCGGGCGAAAGCGGGAATCTCTTCCCGTTCCCGGCTTTT  
BPM24\_rps4 -----  
RRIT251\_rps4 -----  
RRII105\_rps4 -----  
Beta macrocarpa -----TCAATATCTGATCAGTCTCTGTTAGCAGCTTCAGTAGGAT  
Beta vulgaris vulgaris -----TCAATATCTGATCAGTCTCTGTTAGCAGCTTCAGTAGGAT  
Beta vulgaris maritima -----TCAATATCTGATCAGTCTCTGTTAGCAGCTTCAGTAGGAT

Arabidopsis thaliana GAATAGATCAACAAAACAAAGAAAGGACAGGAACAGGGGTT----GTTGC  
Brassica napus GAATAGATCAACAAAACAAAGAAAGGACAGGAACAGGGGTT----GTTGC  
Oryza sativa Japonica T-----TCGGCGGCATCCTTCCGCATTGGCGGCGAGTGGA  
RRIM600\_rps4 -----  
Citrullus lanatus GGCTGGATCGAAGTATCTCGAACATTCCCCATCCGCCGCCAGCTGC  
Cucurbita pepo GG---AAT--AAGTATCTCGAAGATTCTCCATACGCCCGC---CAGCTGC  
PB235\_rps4 -----  
RRIC110\_rps4 -----  
Lotus japonicus TAAGCTGTTAAACCAGCTTAGGAAAGATGAGAACTC-----GCAGC  
Millettia pinnata T-----TTTAA---GCTTAGGAAAGATGAGAACTC-----GCAGC  
BPM24\_rps4 -----  
RRIT251\_rps4 -----  
RRII105\_rps4 -----  
Beta macrocarpa TCAGGTCTTTTCTTTCTTTAAATAGAGGGGTCGCGG-----AA  
Beta vulgaris vulgaris TCAGGTCTTTTCTTTCTTTAAATAGAGGGGTCGCGG-----AA  
Beta vulgaris maritima TCAGGTCTTTTCTTTCTTTAAATAGAGGGGTCGCGG-----AA

Arabidopsis thaliana AGAATTGGGTTTCGAGTCCCAG-GGACGCAATGTGGCTGCTTAAAAAACTG  
Brassica napus AGAATTGGGTTTCGAGTCCCAG-GGACGCAATGTGGCTGCTTAAAAAACTG  
Oryza sativa Japonica AGAGTTGGGTTTCGATTCCCTTTTATACGCGATGTGGCGA---AAAAGACTG  
RRIM600\_rps4 -----  
Citrullus lanatus AGAGG-GGGTTTCGATTCCCGTTATACGCGATGTGGCGA---AAAAGACTG  
Cucurbita pepo AGAGG-GGGTTTCGATTCCCGTTATACGCGATGTGGC-A---AAAAACGG  
PB235\_rps4 -----  
RRIC110\_rps4 -----  
Lotus japonicus AGAGG-GGGTTTCGATTCCCTTTTATACGCGATGTGGCGA---ATCAGACTG  
Millettia pinnata AGAGG-GGCTTCGATTCCCGTTTATACGCGATGTGGCGA---ATCAGACTG  
BPM24\_rps4 -----ACGA  
RRIT251\_rps4 -----ACGA  
RRII105\_rps4 -----  
Beta macrocarpa AGAATTGGGTTTCGAGTCCCAT-AGCCCCGATGTGGCGA---AAAAGACTG  
Beta vulgaris vulgaris AGAATTGGGTTTCGAGTCCCAT-AGCCCCGATGTGGCGA---AAAAGACTG  
Beta vulgaris maritima AGAATTGGGTTTCGAGTCCCAT-AGCCCCGATGTGGCGA---AAAAGACTG

Arabidopsis thaliana ATTCAA-CGA-GATATAGATTTGTCCCCATTAAGATTTCAAACCTTGTCGT  
Brassica napus ATTUAA-CGA-GATATAGATATGTCCCCATTAAGATTTCAAACCTTGTCGT  
Oryza sativa Japonica ATTCAA-CGA-AATAT-GCCATGCCTGCATTAAGATTTAAAACCTTGTCGT  
RRIM600\_rps4 -----A-CGA-GATAT-GCCTTGCTGCATTAAGATTTAAAACCTTGTCGT  
Citrullus lanatus ATTCAA-CAA-GATAT-GCCTTGCTGCATTAAGATTTCAAACCTTGTCGT  
Cucurbita pepo ATTCAA-CAA-GATAT-GCCTTGCTGCATTAAGATTTAAAACCTTGTCGT  
PB235\_rps4 -----A-CGA-GATAT-GCCTTGCTGCATTAAGATTTAAAACCTTGTCGT  
RRIC110\_rps4 -----A-CGA-GATAT-GCCTTGCTGCATTAAGATTTAAAACCTTGTCGT  
Lotus japonicus ATTCAA-CGACGACGA-GATATG-----GATTTAAAACCTTGTCGT  
Millettia pinnata ATTCAA-CGACGACGA-GATATG-----GATTTAAAACCTTGTCGT  
BPM24\_rps4 GATATG-CCTTGCTG-CAT-TAA-----GATTTAAAACCTTGTCGT  
RRIT251\_rps4 GATATG-CCTTGCTG-CAT-TAA-----GATTTAAAACCTTGTCGT  
RRII105\_rps4 -----A-CGA-GATAT-GCCTTGCTGCATTAAGATTTAAAACCTTGTCGT  
Beta macrocarpa ACTGATTCAAACAATAG-ATAATGACTGCATTAAGATTTAAAACCTTGTCGT  
Beta vulgaris vulgaris ACTGATTCAAACAATAG-ATAATGACTGCATTAAGATTTAAAACCTTGTCGT  
Beta vulgaris maritima ACTGATTCAAACAATAG-ATAATGACTGCATTAAGATTTAAAACCTTGTCGT

\* \* \* \* \*

Arabidopsis thaliana  
Brassica napus  
Oryza sativa Japonica  
RRIM600\_rps4  
Citrullus lanatus  
Cucurbita pepo  
PB235\_rps4  
RRIC110\_rps4  
Lotus japonicus  
Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

CTACTTTCAGGAAATGTTU GGAACAGAGAACTGACAATAATACAACGCCG  
CTACTTTCUAGGAAATGTTU GGAACAGAGAACTGACAATAATACAACGTCCG  
CTACTTTCUAGGAAATGTTU GGAACAGAGAACTTTCTAATCCAACGCCG  
CTACTTTCAGGAAATGTTU CGGAAGAGAGAACTTACAATAATACAACGCCG  
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CTACTTTCAGGAAATGTTU GGAACAGAGAACTTACAATAATACAACGCCG  
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CTACTTTCAGGAAATGTTU GGAACAGAGAACTTACAATAATACAACGCCG  
CTACTTTCAGGAAATGTTU GGAACAGAGAACTTACAATAATACAACGCCG  
CTACTTTCAGGAAATGTTU GGAACAGAGAACTTACAATAATACAACGCCG  
CTACTTTCAGGAAATGTTU GGAACAGAGAACTTACAATAATACAACGCCG  
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CTAGTTTCAGGAAATGTTU GGAATAAAGAACTTACTACTATCGCAACGCAT  
CTAGTTTCAGGAAATGTTU GGAATAAAGAACTTACTACTATCGCAACGCAT  
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Arabidopsis thaliana  
Brassica napus  
Oryza sativa Japonica  
RRIM600\_rps4  
Citrullus lanatus  
Cucurbita pepo  
PB235\_rps4  
RRIC110\_rps4  
Lotus japonicus  
Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

CATTCTCCGAAGATTGAGGAACAGGAAGAGATCTATTAAGAAGAGAAAGA  
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CATTCTCCGAAGATTGAGGAACAAGAGAAAGATATTAAGA --- GAAAGA  
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CGCTCTCCGAAAATGGAGAATGAAGAAAAATCTATTAAGA --- AAAAGA  
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Arabidopsis thaliana  
Brassica napus  
Oryza sativa Japonica  
RRIM600\_rps4  
Citrullus lanatus  
Cucurbita pepo  
PB235\_rps4  
RRIC110\_rps4  
Lotus japonicus  
Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

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TGTATUCGAGAAAAAATCGTAACAGTTACATACAATTACGAACTACACGA  
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Arabidopsis thaliana  
Brassica napus  
Oryza sativa Japonica  
RRIM600\_rps4  
Citrullus lanatus  
Cucurbita pepo  
PB235\_rps4

AAGTTGCCCU TTTT UATGGGGATTTACCCATCACAGAGATGCACAGAGG  
AAGTTGUC CCTTTTT UATGGGGATTTACCCATCACAGAGATGCACAGAGG  
AAGTTGTCCCTTTATTATGGGGATTTACCCATAAGGGAGATGCACAGAGG  
AAGTTGCCCTTTTTCATGGGGATTTACCCATCACAGAGATGCACAGAGG  
AAGTTGUCCTTAAATUATGGGGATTTACCCATCACAGAGATGCACAGAGG  
AAGTTGUCCTTTTTUATGGGGATTTACCCATCACAGAGATGCACAGAGG  
AAGTTGCCCTTTTTCATGGGGATTTACCCATCACAGAGATGCACAGAGG

RRIC110\_rps4  
Lotus japonicus  
Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

AAGTTGCCCTTTTTCATGGGGATTTACCCATCACAGAGATGCACAGAGG  
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AAGTTGUCCCTTTTTUATGGGGATTTACCCATCACAGAGATGCACAGAGG  
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AAGTTGTCCCTTTTTUATGGGAATTTACCCATCACAAAGATGCACAGAAG  
AAGTTGTCCCTTTTTUATGGGAATTTACCCATCACAAAGATGCACAGAAG  
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Arabidopsis thaliana  
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RRIM600\_rps4  
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Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

AACAAAACGAACTTCATATATCCCTTTTCUACTCAATCUAGAAACAAGAT  
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Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

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UGGACGTGATTCUGGTTTCGTCTCCATTTTGTGAACTCTTCCTCAAGCA  
CGGACGTTATTCGCTTCGTCTCCATTTTGTGAACTATTCCTCAAGCA  
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CGGACGTTATTCGCTTCGTCTCCATTTTGTGAACTATTCCTCAAGCA  
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TGGACGTTATTCGTGTTTCGTCTACATTTTGTGAACTATTCCTCAAGCA  
TGGACGTTATTCGTGTTTCGTCTACATTTTGTGAACTATTCCTCAAGCA  
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Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris

AGGCAGCUGATAAGTCATCGAAGGGTTTGTGTGAATAAAGGAATGGTAAG  
AGGCAGCUGATAAGTCATCGAAGGGTTTGTGTGAATAAAGGAATGGTAAG  
AGGCAGCUGATAAGTCATCGAAGGGTTTGTGTGAATAAAGGAATGGTAAC  
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Beta vulgaris maritima

AGGCAGCUGATAAGTCATCGAAAAGTGTGTGTGAATAATGGAATAGTAAA  
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Arabidopsis thaliana  
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Oryza sativa Japonica  
RRIM600\_rps4  
Citrullus lanatus  
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PB235\_rps4  
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Lotus japonicus  
Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

CATTACTCATTTTAAACTTTCCCACGGTGATATAATATCTTTTCAAGAAA  
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CATTAGTCATTTTAAAGTTTCCCACGGTGATATAATATCTTTTCAAGAAA  
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Arabidopsis thaliana  
Brassica napus  
Oryza sativa Japonica  
RRIM600\_rps4  
Citrullus lanatus  
Cucurbita pepo  
PB235\_rps4  
RRIC110\_rps4  
Lotus japonicus  
Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

ATAACGCGATAATACGCGGTGAAGAAAATAAGGAGATCTTTCTATAAAGAA  
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ATGACGCGAGAACCCGCGGTGAAGAAAATAAGGAGATCTTTCTATATCGAC  
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ATTACGCGAGAACCCGCGGTGAAGAAAATAAGGAAATTTTTUTATATCAA  
ATTACGCGAGAACCCGCGGTGAAGAAAATAAGGAAATTTTTUTATATCAA  
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Arabidopsis thaliana  
Brassica napus  
Oryza sativa Japonica  
RRIM600\_rps4  
Citrullus lanatus  
Cucurbita pepo  
PB235\_rps4  
RRIC110\_rps4  
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Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

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Arabidopsis thaliana  
Brassica napus  
Oryza sativa Japonica  
RRIM600\_rps4  
Citrullus lanatus

-----TAAGAATGTGGAGAA  
-----TAAGAATGTGGAGAA  
-----TCAGAATCTGGAGAA  
-----TAAGAATGTGGAGAA  
-----TAAGAATGTGGAGAA



Beta macrocarpa  
 Beta vulgaris vulgaris  
 Beta vulgaris maritima

AGAACAAGACTTAGAAAGAACAAGAAAGTT---TGGATCCGA-----  
 AGAACAAGACTTAGAAAGAACAAGAAAGTT---TGGATCCGA-----  
 AGAACAAGACTTAGAAAGAACAAGAAAGTT---TGGATCCGA-----  
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Arabidopsis thaliana  
 Brassica napus  
 Oryza sativa Japonica  
 RRIM600\_rps4  
 Citrullus lanatus  
 Cucurbita pepo  
 PB235\_rps4  
 RRIC110\_rps4  
 Lotus japonicus  
 Millettia pinnata  
 BPM24\_rps4  
 RRIT251\_rps4  
 RRII105\_rps4  
 Beta macrocarpa  
 Beta vulgaris vulgaris  
 Beta vulgaris maritima

GCTTAGGAAGTTCCTTCGCTGAGCACAAAGAGAATGAAGAGGAATTTGT--  
 GCTTAGGAAGTTCCTTCGCTGAGCACAAAGAGAATGAAGAGGAATTTGT--  
 GCTTAGGCAGTTCCTTCGCTGAGCACAAACAGAATGAAGAGGAATTTGTTT  
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 -----CGCTGAGCACAAACAGAATGAAGAGGAATTTTCT  
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Arabidopsis thaliana  
 Brassica napus  
 Oryza sativa Japonica  
 RRIM600\_rps4  
 Citrullus lanatus  
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 PB235\_rps4  
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 Lotus japonicus  
 Millettia pinnata  
 BPM24\_rps4  
 RRIT251\_rps4  
 RRII105\_rps4  
 Beta macrocarpa  
 Beta vulgaris vulgaris  
 Beta vulgaris maritima

---TAAATCCCTATTCTTATCGAAGAGAAGGAAGGATAAA---AACC  
 ---TAAATCCCTATTCTTATCGAAGAGAAGGAAGGAGAAA---AACC  
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 CATTTCGAAATCCCTATTCTTATCGAAGAAAAGGAACGAGAAA---AACC  
 CACTCCGTGACCTTATTCTTATCGAA-----  
 CACTCCGTGACCTTATTCTTATCGAA-----  
 CACTCCGTGACCTTATTCTTATCGAA-----  
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Arabidopsis thaliana  
 Brassica napus  
 Oryza sativa Japonica  
 RRIM600\_rps4  
 Citrullus lanatus  
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 PB235\_rps4  
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 Lotus japonicus  
 Millettia pinnata  
 BPM24\_rps4  
 RRIT251\_rps4  
 RRII105\_rps4  
 Beta macrocarpa  
 Beta vulgaris vulgaris  
 Beta vulgaris maritima

TAA-----ATCTTCCTACTCGAACAATCAGTCCTA  
 TAA-----ATCTTCCTACTCGAACAATCAGTCCTA  
 GATAAGAACAATAGGGGAAGCGGAAAACCGAAAAAGAGCAATAAGTCCTT  
 GA-----AATCTTCCTACTCGAATAAGAAGTCCTA  
 GAA-----ATCTTCCTACTCGAACAAGAAGTCCTA  
 GAA-----ATCTTCCTACTCGAAGAATCAGTCCTA  
 GAA-----ATCTTCCTACTCGAATAAGAAGTCCTA  
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 GAT-----ATCTTCCTACTCGAACAAGAAGTCCTA  
 GAT-----ATCTTCCTACTCGAACAAGAAGTCCTA  
 GAA-----ATCTTCCTACTCGAATAAGAAGTCCTA  
 GAA-----ATCTTCCTACTCGAATAAGAAGTCCTA  
 GAA-----ATCTTCCTACTCGAATAAGAAGTCCTA  
 GAA-----ATCTTCCTACTCGAATAAGAAGTCCTA  
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Arabidopsis thaliana  
 Brassica napus  
 Oryza sativa Japonica

TAGTTTACAACCTTTCTTTATCTTTATATAGTAATTCGACCTATTGCTTC  
 TAGTTTACAACCTTTCTTTATCTTTATATAGTAATTCGACCTATTGCTTC  
 TTGTTTACAAGTCTTTCTTTAT-----ATAGAAATTCGACCTATTGCTCU

RRIM600\_rps4  
Citrullus lanatus  
Cucurbita pepo  
PB235\_rps4  
RRIC110\_rps4  
Lotus japonicus  
Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

TAGTTTACAACCTCTTCTTTAT-----ATAGTAATTCGATCTATTGCTCC  
TAGTTTACAACCTCTTCTTTAT-----ATAGTAATTCGACCTATTGCTCC  
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TAGTTTACAACCTCTTCTTTAT-----ATAGTAATTCGATCTATTGCTCC  
TAGTTTACAACCTCTTCTTTAT-----ATAGTAATTCGATCTATTGCTCC  
TAGTTTACAACCTCTTCTTTAT-----ATAGTAATTCGATCTATTGCTCC  
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BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

GCATCCCCCATAAGTTGACTATGAAGAGAAGAATCAAAGGATCGAACT  
GCATCCCCCATAAGTTGACTATGAAGAGAAGAATCAAAGGATUGAACT  
GGATCCCC-----GTTTACTAGGAAGATAAGAATCAAAGGATUGAACT  
GCATCCCCCTATCAGTTTACTATGAAGAGAAGAATCAAAGGATCGAACT  
GCATCCCCCATCAGTTTACTATGAAGAGCAAATCAAAGGATCGAACT  
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GCATCCCCCTATCAGTTTACTATGAAGAGAAGAATCAAAGGATCGAACT  
GCATCCCCCTATCAGTTTACTATGAAGAGAAGAATCAAAGGATCGAACT  
TCATCCCCCATCAGTTTACTATGAAGAGAAGAATUAAAAGGATCGAACT  
TCATCCCCCATCAGTTTACTATGAAGAGAAGAATUAAAAGGATCGAACT  
GCATCCCCCTATCAGTTTACTATGAAGAGAAGAATCAAAGGATCGAACT  
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-----GAAGAGAAGAATCAAAGGATAGAACT  
-----GAAGAGAAGAATCAAAGGATAGAACT  
-----GAAGAGAAGAATCAAAGGATAGAACT  
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Arabidopsis thaliana  
Brassica napus  
Oryza sativa Japonica  
RRIM600\_rps4  
Citrullus lanatus  
Cucurbita pepo  
PB235\_rps4  
RRIC110\_rps4  
Lotus japonicus  
Millettia pinnata  
BPM24\_rps4  
RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

ACCTACTCATTATTUGGAGGTGAATUATAGAACACCAAAGCTGTGGTAT  
ACCTACTCATTATTUGGAGGTGAATUATAGAACACCAAAGCTGTGGTAT  
ACCTACTCATTATTUGGAGGTGAATUATAGAACACTAAAAGCTGTGGTAT  
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ACCTACTCATTATTTCGGAGGTCAATCATAGAACACTAAAAGCTGTGGTAT  
\*\*\*\*\* \*\*\*\*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\*\*\*\* \*\*\*\*\*

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BPM24\_rps4

UTTATGGACCTAACATAGGTCATATCCCTCACGACATAAGATTAAAAGAT  
UTTATGGACCTAACATAGGTCATATCCCTCACGACATAAGATTAAAAGAT  
UTTATGGACCTAACATAGGTCACATCCCTCACGACATAAGATTGAAAGAT  
CTTATGGACCGAACATAGGTCATATCCCTCACGACATAAGATTGAAAGAT  
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TTTATGGACCTAACATAGGTCACATCCCTCACGACATAAGATTGAAAGAT  
CTTATGGACCGAACATAGGTCATATCCCTCACGACATAAGATTGAAAGAT

RRIT251\_rps4  
RRII105\_rps4  
Beta macrocarpa  
Beta vulgaris vulgaris  
Beta vulgaris maritima

CTTATGGACCGAACATAGGTCATATCCCTCACGACATAAGATTGAAAGAT  
CTTATGGACCGAACATAGGTCATATCCCTCACGACATAAGATTGAAAGAT  
UTTATGGACCTAACATAGATCACATCCCTCACGACATAAGATTGAAAGAT  
UTTATGGACCTAACATAGATCACATCCCTCACGACATAAGATTGAAAGAT  
UTTATGGACCTAACATAGATCACATCCCTCACGACATAAGATTGAAAGAT  
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UUAAACCTTCUTCTTUGGAGCAGAAACGGACGTGGCCAAAACATATAAA-  
UUAAACCTTCUTCTTUGGAGCAGAAACGGACGTGGCCAAAACATATAAA-  
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CUAAACCTTCUTCTTUGGAGCGAAACGGACGTGGCCAAAACATATAAA-  
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TTAAACCTTCUTCTTUGGAGCGAAACGGACGTGGCCAAAACATATAAA-  
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CUAAACCTTCUTCTTUGGAGCGAAAGGGACGTGGCCAAAACACATAAA-  
CUAAACCTTCUTCTTUGGAGCGAAAGGGACGTGGCCAAAACACATAAA-  
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---GATCGGCGTAGTCACTCATAGGGACATCTCTATCCGGATAGAGGATA  
---GATCGGCGTAGTCACTCGTAGTAGGA-----GTCAAGATATTGCGTA  
AAAGATCGGCCTAGTCGCTCATAGGGACATATCTATCCGGATAGAGGATA  
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---GATCGGCGTAGTCGCTCATAGGGACATATCTATCCGTCTCGAGTCTC  
---GATCGGC-----TCGCTC-----GGACATATCTATCCGTCTCGAGTCTC  
-----  
---GATCGGCGTAGTCGCTCATAGGGACATATCTATCCGGATAGAGGATA  
---GATCGGCGTAGTCGCTCATAGGGACATATCTATCCGGATAGAGGATA  
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---GATCGGCGTAGTCGCTCATAGGGACATATCTATCCGGATAGAGATAA  
---GATCGGCGTAGTCGCTCATAGGGACATATCTATCCGGATAGAGATAA  
---GATCGGCGTAGTCGCTCATAGGGACATATCTATCCGGATAGAGATAA

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GTCTAGATCGATTCATAGATGGATTTT--TTCATCTAGATAGGTATC-CC  
---TAAATATATATAAAGAGAGAGTCT--CTTGAGCGGCCGAGAATC-TT  
GTCTAGATCAATTTATTGATAAATCTCTCTATATAGATAGGTATCTCT  
-----  
GTCTAGATCGATTCATAGATCGATTTCTATCCATATGTATCGGTATCTCC  
GTGACGATCGATTCATAGATCGATTTCTATCCATATGTAGCGGTATCGCC  
-----  
-----  
GTCTAGATCGATTCATAGATAGATTTCTATCCATATAGATAGGTATCTCC  
GTCTAGATCGATTCATAGATAG-----CCATATAGATAGGTATCTCC  
-----  
-----  
GGACAGGGATCCATCTAGAAAAAAT--ATTGAACCGGTTTCATTTTTTTT  
GGACAGGGATCCATCTAGAAAAAAT--ATTGAACCGGTTTCATTTTTTTT  
GGACAGGGATCCATCTAGAAAAAAT--ATTGAACCGGTTTCATTTTTTTT

Arabidopsis thaliana

GTGGATAGAGAGAAAGATAGGGATCCATCTAGATCTT--GATTCACTATT



Brassica napus	ATGT - CAAAAGGACCAAGGACGATCTTTTCGGAAAGGAGGAGTCAGTCTT
Oryza sativa Japonica	GTGGATAGAGATAAAGATAGGGATCCCTATAAATC - -GAAAAGTGCACTT
RRIM600_rps4	-----
Citrullus lanatus	GTGGATAGAGATAAAGATAGGGATCCATCTAGATCTTGATTCACTATTT-
Cucurbita pepo	GTGGATAGAGATAAAGATAGGGATCCATCTAGATCTTGATTCACTATTTG
PB235_rps4	-----
RRIC110_rps4	-----
Lotus japonicus	GTGGATAGAGATAAAGATAGGGATCCATCTAGATCTTGCTTGATTCACTA
Millettia pinnata	GTGGATAGAGATAAAGATAGGGATCCATCTAGATCTTGCTTGATTCACTA
BPM24_rps4	-----
RRIT251_rps4	-----
RRII105_rps4	-----
Beta macrocarpa	TTTTCTTGATTCTGATTGATTGCCTTTTTTTTGACGACAAGTTTTAA----
Beta vulgaris vulgaris	TTTTCTTGATTCTGATTGATTGCCTTTTTTTTGACGACAAGTTTTAA----
Beta vulgaris maritima	TTTTCTTGATTCTGATTGATTGCCTTTTTTTTGACGACAAGTTTTAA----

Arabidopsis thaliana	TCC---ATTTTTTTTTACTTAGTC----
Brassica napus	CTTTGAAGATCGAGGCGGTAGCGGACA
Oryza sativa Japonica	TTTGACTACT-----
RRIM600_rps4	-----
Citrullus lanatus	-----CCATTTTTTTGA-----
Cucurbita pepo	ATTGATTGCCTTTTTCAACAAG-----
PB235_rps4	-----
RRIC110_rps4	-----
Lotus japonicus	TTT--CCATTTTTTTC-----
Millettia pinnata	TTT--CCATTTTTTTTTCTTGATT----
BPM24_rps4	-----
RRIT251_rps4	-----
RRII105_rps4	-----
Beta macrocarpa	-----
Beta vulgaris vulgaris	-----
Beta vulgaris maritima	-----