

**Table S3.** The putative fast-evolving genes performed by branch model of PAML.

ID	LnI1	LnI2	LRT	w <sub>back</sub>	w <sub>fore</sub>	P <sub>value</sub>	P <sub>adjust</sub>
OG0011068	-3819.976557	-3827.3988	14.84439	0.05041	0.11394	0.0001168	0.000904851
OG0011073	-6114.919209	-6118.9017	7.965068	0.08226	0.0527	0.0047689	0.014492016
OG0011088	-2530.032932	-2532.8276	5.589416	0.02225	0.02017	0.0180693	0.039080157
OG0011106	-2179.26494	-2182.4261	6.322396	0.04867	0.02742	0.0119222	0.029345722
OG0011107	-6475.715447	-6478.6557	5.880474	0.08088	0.04847	0.0153097	0.035595053
OG0011113	-16259.53421	-16277.993	36.917906	0.0517	0.0567	1.00E-09	9.30E-08
OG0011125	-11190.51734	-11197.012	12.988554	0.0457	0.05339	0.0003134	0.001943086
OG0011132	-5450.853735	-5458.7744	15.841398	0.0279	0.02898	6.89E-05	0.000610071
OG0011136	-10413.32989	-10420.477	14.294406	0.06105	0.2037	0.0001563	0.001144379
OG0011138	-12830.49681	-12842.59	24.187048	0.12124	0.22935	8.74E-07	3.25E-05
OG0011153	-7364.151818	-7369.7203	11.137012	0.08605	0.09866	0.0008462	0.00374755
OG0011160	-10185.93402	-10189.536	7.204546	0.07353	0.05245	0.0072719	0.020808862
OG0011172	-1652.845827	-1657.0219	8.352078	0.03248	0.02868	0.0038525	0.012497988
OG0011177	-5764.9506	-5767.8765	5.85185	0.09741	0.0873	0.0155607	0.035707017
OG0011181	-7738.969222	-7749.6292	21.320052	0.05765	0.04281	3.89E-06	9.03E-05
OG0011200	-4915.891937	-4918.961	6.138178	0.17493	0.11949	0.0132294	0.031546926
OG0011204	-10319.38417	-10327.559	16.348842	0.0699	0.11325	5.27E-05	0.000544443
OG0011211	-5612.814653	-5618.9971	12.364882	0.06108	0.025	0.0004375	0.002489123
OG0011213	-11787.39353	-11795.12	15.45393	0.04467	0.05044	8.45E-05	0.000714756
OG0011223	-4384.224586	-4388.501	8.55274	0.09078	0.07556	0.00345	0.011667357
OG0011229	-7417.987626	-7420.7146	5.45386	0.05954	0.10023	0.0195251	0.041743403
OG0011231	-8476.17673	-8485.0559	17.758358	0.03881	0.05938	2.51E-05	0.000320094
OG0011232	-1391.475099	-1397.2747	11.599152	0.01575	1.00E-04	0.0006598	0.003068158
OG0011236	-7654.148211	-7660.0144	11.732416	0.06697	0.06875	0.0006142	0.003058511
OG0011237	-6126.452771	-6130.1515	7.39748	0.07245	0.11866	0.0065315	0.018982262
OG0011238	-2421.466388	-2425.2043	7.475766	0.08434	0.09026	0.0062535	0.0184627
OG0011267	-2813.034178	-2820.5751	15.081788	0.00945	0.01275	0.000103	0.000832568
OG0011269	-5402.756115	-5424.8948	44.277424	0.09547	0.04961	0	0
OG0011274	-2243.862463	-2247.4193	7.113752	0.06767	0.03146	0.0076495	0.021557637
OG0011286	-5427.852063	-5433.6667	11.629312	0.13104	0.21093	0.0006492	0.003068158
OG0011294	-4509.234013	-4517.7053	16.942672	0.04769	0.02357	3.85E-05	0.000421728
OG0011296	-1347.913374	-1351.2956	6.764442	0.04034	0.13244	0.0092992	0.024022933
OG0011300	-3402.914355	-3407.0799	8.331092	0.04357	0.03325	0.0038972	0.012497988
OG0011302	-11889.70225	-11895.552	11.700428	0.05011	0.06675	0.0006249	0.003058511
OG0011303	-9729.626834	-9737.5674	15.88109	0.07721	0.18724	6.74E-05	0.000610071
OG0011305	-4544.426931	-4553.2787	17.70357	0.07838	0.04056	2.58E-05	0.000320094
OG0011315	-9595.734241	-9599.0547	6.640932	0.06955	0.14738	0.0099662	0.025393275

OG0011347	-6267.760532	-6274.6414	13.761758	0.04706	0.0467	0.0002075	0.001378512
OG0011352	-12831.90084	-12842.788	21.774346	0.08735	0.10335	3.07E-06	8.15E-05
OG0011358	-3294.222576	-3301.2999	14.154736	0.1087	0.16498	0.0001684	0.001159903
OG0011362	-5963.028091	-5967.584	9.11173	0.34036	0.31249	0.0025398	0.009447892
OG0011365	-5151.62795	-5154.3114	5.366838	0.03339	0.03509	0.0205231	0.042604873
OG0011370	-5186.378507	-5189.8731	6.989096	0.12248	0.07118	0.0082008	0.02210644
OG0011376	-3844.570615	-3849.276	9.41069	0.07697	0.12462	0.0021572	0.00833228
OG0011380	-6376.466029	-6379.5543	6.176442	0.04032	0.02301	0.0129462	0.031272724
OG0011639	-5602.533647	-5609.6592	14.251104	0.05255	0.06021	0.00016	0.001144379
OG0011381	-3988.678579	-3993.0654	8.77362	0.07239	0.05238	0.0030562	0.010931732
OG0011385	-3729.520507	-3735.6663	12.291604	0.03881	0.05445	0.000455	0.002489123
OG0011388	-3480.906718	-3486.3661	10.91882	0.08166	0.04432	0.0009519	0.004117616
OG0011417	-8285.538685	-8288.3575	5.637632	0.03185	0.04468	0.0175789	0.038466844
OG0011420	-3856.448977	-3860.5003	8.102558	0.07403	0.0502	0.0044203	0.013702877
OG0011421	-2892.92339	-2896.8943	7.941764	0.08963	0.13281	0.0048307	0.014492016
OG0011422	-15323.8458	-15328.535	9.378824	0.09833	0.11019	0.0021951	0.00833228
OG0011423	-6747.852196	-6756.8195	17.93452	0.06657	0.06384	2.29E-05	0.000320094
OG0011428	-8812.660931	-8821.7768	18.231744	0.02747	0.08986	1.96E-05	0.000303165
OG0011433	-6170.750666	-6177.1701	12.838912	0.02122	0.0154	0.0003395	0.00203691
OG0011435	-1600.478433	-1603.2992	5.641556	0.01863	0.04527	0.0175396	0.038466844
OG0011439	-2875.78038	-2883.7952	16.029734	0.09161	0.03819	6.24E-05	0.000610071
OG0011454	-2753.862228	-2759.0421	10.359714	0.08917	0.08149	0.001288	0.005444524
OG0011467	-5513.958605	-5517.4566	6.996046	0.07424	0.10409	0.008169	0.02210644
OG0011471	-4467.885498	-4471.0416	6.31224	0.09546	0.10179	0.0119907	0.029345722
OG0011475	-4483.916446	-4486.8322	5.831488	0.05246	0.10513	0.0157418	0.035707017
OG0011480	-19687.14921	-19703.924	33.549712	0.0509	0.08109	7.00E-09	4.34E-07
OG0011484	-2194.626762	-2199.0738	8.894086	0.07249	0.06641	0.002861	0.010434082
OG0011489	-5299.605897	-5305.7548	12.297834	0.05726	0.04374	0.0004535	0.002489123
OG0011491	-1637.181572	-1640.1763	5.98947	0.01062	1.00E-04	0.0143915	0.033883846
OG0011499	-1522.155749	-1526.457	8.602468	0.03406	0.00738	0.0033571	0.011563269
OG0011505	-3360.510715	-3364.6902	8.358894	0.0726	0.03053	0.003838	0.012497988
OG0011510	-4140.094369	-4149.9752	19.761704	0.08868	0.10502	8.77E-06	0.000181288
OG0011530	-7318.386661	-7325.0458	13.318266	0.06253	0.06413	0.0002628	0.001685756
OG0011535	-1689.2322	-1692.4651	6.46571	0.0859	0.0151	0.0109976	0.027642538
OG0011538	-2536.995684	-2546.3227	18.65405	0.11501	0.08792	1.57E-05	0.000264982
OG0011539	-11307.02819	-11312.97	11.883286	0.04291	0.02728	0.0005664	0.002930709
OG0011540	-4294.142682	-4296.7554	5.225476	0.06936	0.02843	0.0222584	0.045000585
OG0011541	-1651.1743	-1655.2385	8.12836	0.04815	0.00609	0.0043578	0.013702877
OG0011546	-3268.832789	-3279.7878	21.910026	0.12425	0.02747	2.86E-06	8.15E-05
OG0011548	-2844.651975	-2847.3068	5.309678	0.0256	0.02088	0.0212073	0.04334674

OG0011550	-3156.402716	-3166.0528	19.300082	0.09809	0.0598	1.12E-05	0.000207762
OG0011551	-5286.699435	-5290.2317	7.064586	0.03364	0.05031	0.0078622	0.021826539
OG0011556	-4777.333663	-4782.0775	9.487752	0.06829	0.04255	0.0020685	0.008185904
OG0011562	-3260.896493	-3263.7594	5.725838	0.13525	0.02481	0.0167171	0.037462321
OG0011566	-6471.733617	-6477.6739	11.880544	0.11563	0.11267	0.0005672	0.002930709
OG0011570	-10645.04214	-10649.393	8.700824	0.05006	0.07449	0.0031807	0.011162323
OG0011577	-4703.609492	-4707.0398	6.86055	0.08454	0.03864	0.0088119	0.023084806
OG0011598	-1768.008444	-1770.7246	5.432376	0.05571	0.17887	0.0197668	0.04177976
OG0011599	-9113.757181	-9127.7487	27.982994	0.06855	0.03103	1.22E-07	5.67E-06
OG0011602	-5372.744988	-5375.4245	5.359028	0.07534	0.02692	0.0206153	0.042604873
OG0011617	-4866.270395	-4871.9259	11.310976	0.04805	0.11112	0.0007705	0.003495453
OG0011624	-5834.96282	-5840.1087	10.291776	0.0689	0.04741	0.0013362	0.005523142
OG0011626	-7524.055078	-7532.5259	16.9417	0.07146	0.04531	3.85E-05	0.000421728
OG0011628	-7172.743872	-7177.508	9.52835	0.05164	0.0694	0.0020232	0.008180842
OG0011638	-5217.239889	-5220.7173	6.954894	0.06161	0.04235	0.008359	0.022211124