

**Self-crossing leads to weak co-variation of the bacterial and fungal communities
in the rice rhizosphere**

Supplementary Material

Table S1. The key bacterial families with significant differences among different rice generations identified by LEfSe analysis.

Bacterial family	Correct P-values	Or abundance	Os abundance	F1 abundance	F2 abundance	F3 abundance	F4 abundance	LDA score
<i>Anaerolineaceae</i>	0.0003	1067700	1131200	1461400	1741300	2199000	1801500	5.75
<i>Nitrospiraceae</i>	0.0003	389490	1120100	101160	506460	112650	240670	5.71
<i>Hydrogenophilaceae</i>	0.0003	346430	853700	60175	594960	124510	384560	5.6
<i>Xanthobacteraceae</i>	0.0003	375590	88823	803350	323610	284550	608720	5.55
<i>Acidobacteriaceae Subgroup 1</i>	0.0003	388420	70546	465930	381380	85692	8990.8	5.36
<i>Bradyrhizobiaceae</i>	0.0007	298740	107660	296480	457550	230080	118480	5.24
<i>Archangiaceae</i>	0.0007	451710	169920	176960	135810	118270	134110	5.22
<i>Nocardioidaceae</i>	0.0003	280490	2922.3	22822	0	10408	36241	5.15
<i>Comamonadaceae</i>	0.0003	70292	247140	0	57143	34326	28629	5.09
<i>Mycobacteriaceae</i>	0.0003	288660	55654	201390	98992	94667	181810	5.07
<i>Geobacteraceae</i>	0.0003	111790	233750	2733.8	56331	25372	3860.5	5.06
<i>Gemmatimonadaceae</i>	0.0004	273450	55722	213170	139940	144750	115050	5.04
<i>Nitrosomonadaceae</i>	0.0003	221300	121390	77428	192730	17314	65540	5.01
<i>Burkholderiales Incertae Sedis</i>	0.0003	0	41066	0	0	182810	0	4.96
<i>Planctomycetaceae</i>	0.0020	75951	36132	62990	29993	71331	199500	4.93
<i>Syntrophaceae</i>	0.0006	59782	191500	39208	92952	37930	30226	4.91
<i>Nakamurellaceae</i>	0.0003	81448	25456	10965	141560	62642	3935.3	4.84
<i>Cellulomonadaceae</i>	0.0007	15611	16667	0	2557.1	138320	9345.8	4.84
<i>Kineosporiaceae</i>	0.0003	42651	10781	130360	72493	52505	16395	4.78
<i>Holophagaceae</i>	0.0003	40657	119120	0	23035	15153	1980.2	4.77
<i>Frankiaceae</i>	0.0006	25745	963.39	109390	7725.4	17230	19894	4.73
<i>Micromonosporaceae</i>	0.0005	55015	9811.1	115830	17974	36951	64740	4.72
<i>uncultured Aminicenantes</i>	0.0004	0	96573	0	6826.8	17168	4132.2	4.68
<i>Gallionellaceae</i>	0.0006	42951	98743	3643.7	2571.6	28455	16876	4.68
<i>Roseiflexaceae</i>	0.0003	0	3882	47340	14482	93718	73556	4.67
<i>Geodermatophilaceae</i>	0.0020	122040	54668	66559	45228	135760	94962	4.66
<i>Methylocystaceae</i>	0.0007	102990	140650	157670	87165	134260	173550	4.64
<i>uncultured Acidobacteria</i>	0.0004	12516	95652	33693	73349	44778	95313	4.62
<i>Caldilineaceae</i>	0.0004	84908	28476	1842.5	11995	9522.6	30692	4.62
<i>Haliangiaceae</i>	0.0007	49042	31219	47476	44465	89541	15673	4.57
<i>uncultured Chloroflexi</i>	0.0040	71787	71458	30092	72328	104770	61663	4.57
<i>Intrasporangiaceae</i>	0.0003	71817	1005.5	17282	0	37151	10820	4.56
<i>Clostridiaceae</i>	0.0003	77312	33274	61085	5977.4	35233	58391	4.55
<i>uncultured Caldilineae</i>	0.0003	4200.7	65538	0	28075	14317	19724	4.52
<i>Coriobacteriaceae</i>	0.0005	66770	40142	2737.2	2520.5	62459	66518	4.51
<i>Caulobacteraceae</i>	0.0005	64862	16540	15496	33271	2855.8	12559	4.49
<i>Rhodobiaceae</i>	0.0010	94217	38212	100310	44399	38653	54890	4.49
<i>Xanthomonadaceae</i>	0.0012	9285.3	61460	14585	17090	11280	0	4.49
<i>Roseiarcaceae</i>	0.0011	6243.8	8759.7	8208.1	58000	13280	0	4.46
<i>Bacillaceae</i>	0.0004	57483	22443	61066	5940.5	18823	23896	4.44
<i>Gaiellaceae</i>	0.0007	26111	17723	55611	862.81	20744	41438	4.44
<i>uncultured proteobacterium</i>	0.0004	54180	34136	3666.5	46227	977.52	5804.4	4.42
<i>Desulfarculaceae</i>	0.0005	7321.3	47752	0	22191	1889.4	7941.9	4.38
<i>Helicobacteraceae</i>	0.0005	29386	45936	0	8578.2	3778.8	1991.4	4.36
<i>Hyphomicrobiaceae</i>	0.0003	0	13719	0	40073	21886	0	4.3
<i>uncultured Anaerolineaceae</i>	0.0005	2028.4	14715	27381	38417	37058	10878	4.26
<i>Acidimicrobiaceae</i>	0.0007	37590	14640	20072	846.02	29516	28582	4.26
<i>Sporichthyaceae</i>	0.0010	36563	0	2741.4	2579.9	0	0	4.26
<i>Syntrophobacteraceae</i>	0.0007	12574	35187	0	11920	912.83	11788	4.25
<i>Streptomycetaceae</i>	0.0011	38543	3905.5	16387	4284.2	14388	23752	4.24
<i>Acetobacteraceae</i>	0.0005	5185.1	34251	10930	33354	13214	0	4.23
<i>Sphingomonadaceae</i>	0.0003	20997	32284	0	0	0	0	4.21

<i>Desulfobacteraceae</i>	0.0006	3086	31363	0	20473	8478.8	7954.3	4.2
<i>uncultured Gemmatimonadetes</i>	0.0003	8378.9	6866.3	0	1731.2	0	30987	4.19
<i>Rhodocyclaceae</i>	0.0006	29168	24367	0	0	1881.8	6931.2	4.16
<i>Xanthomonadales Incertae Sedis</i>	0.0018	12504	21486	13676	16248	2871	25699	4.06
<i>Fraxinus excelsior (European ash)</i>	0.0003	0	0	0	0	21876	8839.4	4.04
<i>Thermomonosporaceae</i>	0.0010	2085.4	985.71	20960	0	0	9675.5	4.02
<i>Rhizobiales Incertae Sedis</i>	0.0036	19831	6800.7	12757	17132	10230	0	4
<i>uncultured Bellilinea sp.</i>	0.0132	3093.4	959.69	20071	3456.9	2864.4	2998.7	3.98
<i>Syntrophorhabdaceae</i>	0.0004	2142.5	11730	913.24	17057	0	0	3.93
<i>Desulfovibrionaceae</i>	0.0005	15680	8814.4	0	846.02	0	0	3.89
<i>Beijerinckiaceae</i>	0.0010	8314.6	0	5466.7	0	917.85	14791	3.87
<i>Trebouxiophyceae sp.</i>	0.0007	14646	3908	0	0	13464	1980.2	3.86
<i>uncultured Parcubacteria group</i>	0.0081	5322.7	2011.1	2754.5	12795	0	0	3.81
<i>Draconibacteriaceae</i>	0.0034	0	8756	0	5906.2	0	2902.2	3.64
<i>uncultured Streptomyces sp.</i>	0.0027	0	0	8204.8	828.5	5612.9	1980.2	3.61
<i>Candidatus Falkowbacteria</i>	0.0069	0	5831.1	0	6898.4	2866	0	3.54
<i>Alcaligenaceae</i>	0.0341	1065	0	2738.5	0	6646.6	6037.7	3.52
Total abundance		6295143	6046846	5245158	5940885	5210559	5140345	
Selected bacteria/total bacteria		62.95%	60.47%	52.45%	59.41%	52.11%	51.40%	

Table S2. The key fungal families with significant differences among different rice generations identified by LEfSe analysis.

Fungal family	Correct <i>P</i> -value	Or abundance	Os abundance	F1 abundance	F2 abundance	F3 abundance	F4 abundance	LDA score
<i>Lasiosphaeriaceae</i>	0.0005	161730	3967400	725870	38932	82131	233930	6.29
<i>Pyronemataceae</i>	0.0005	281190	382390	151800	46742	190520	1013100	5.68
<i>Cordycipitaceae</i>	0.0006	315860	2947.8	647830	1395.2	3175	21917	5.51
<i>Mortierellaceae</i>	0.0008	777.65	625.49	527490	103.37	972.97	82161	5.42
<i>Boletaceae</i>	0.0005	103480	15887	517460	2378.2	7099.9	73922	5.41
<i>Cryphonectriaceae</i>	0.0005	1931	1213	444120	192.31	194.87	12029	5.35
<i>Trichocomaceae</i>	0.0008	76960	71583	118420	12966	52517	327170	5.2
<i>Chaetomiaceae</i>	0.0005	11250	33488	52542	5785.2	12430	280480	5.14
<i>Pleosporaceae</i>	0.0005	481.13	269200	292.88	3009.8	0	0	5.13
<i>Basidiobolaceae</i>	0.0008	97958	310210	42561	240440	283440	299430	5.13
<i>Sporormiaceae</i>	0.0005	51467	52326	230300	15463	126020	253950	5.08
<i>Mycosphaerellaceae</i>	0.0005	198.27	17745	6353.4	7286.9	226970	6934.4	5.05
<i>Ustilaginaceae</i>	0.0005	698.35	18672	11400	83867	216660	175160	5.03
<i>Nectriaceae</i>	0.0005	24624	46811	230950	17708	226060	140360	5.03
<i>Terramyctaceae</i>	0.0005	9806.2	202530	1643	2751.8	0	3428.2	5.01
<i>Claroideoglomeraceae</i>	0.0005	5012.7	190910	668.92	192.31	20764	4562.8	4.98
<i>Orbiliaceae</i>	0.0005	187.33	167590	1829.2	153320	1274.1	0	4.92
<i>Teloschistaceae</i>	0.0006	15368	916.12	133250	828.9	1275.7	8630.6	4.82
<i>Entolomataceae</i>	0.0015	0	204.16	189.47	0	499.44	129900	4.81
<i>Teratosphaeriaceae</i>	0.0005	18957	37152	3598.1	5819.6	123220	754.91	4.79
<i>Blastocladiaceae</i>	0.0005	948.52	12296	4432.8	807.15	57188	103160	4.71
<i>Hydnodontaceae</i>	0.0005	5447.6	30295	71560	12872	13695	106520	4.7
<i>Phallaceae</i>	0.0017	198.27	1120.1	0	97.532	84568	0	4.63
<i>Sebacinales Group B</i>	0.0005	6708.4	33194	50153	8095.5	24937	81200	4.57
<i>Kickxellaceae</i>	0.0005	3306.9	10198	23366	10005	4210	59136	4.45
<i>Lulworthiaceae</i>	0.0006	62315	52164	25737	67134	11444	29629	4.44
<i>Cucurbitariaceae</i>	0.0005	3532.6	56633	10698	15026	2942.6	9584.5	4.43
<i>Cortinariaceae</i>	0.0005	4689.1	23627	8607.4	1498.3	30759	46742	4.35
<i>Archaeosporaceae</i>	0.0008	43772	1038.4	195.26	0	0	1183.8	4.34
<i>Helotiaceae</i>	0.0005	0	3604.8	5180.7	14979	41906	9455.4	4.32
<i>Microthyriaceae</i>	0.0005	0	39999	0	0	0	2641.1	4.3
<i>Phaeosphaeriaceae</i>	0.0005	184.83	37916	6687.1	6897.1	8933.5	107.77	4.28
<i>Didymosphaeriaceae</i>	0.0006	1895.6	706.33	37885	1013.9	3028.5	20894	4.27
<i>Diversisporaceae</i>	0.0050	10815	2225.9	9605.7	9168.7	10518	39520	4.27
<i>Strophariaceae</i>	0.0005	713.24	4114	32026	838.17	3732.2	20873	4.19
<i>Gomphidiaceae</i>	0.0005	1502.3	9155	10826	3013.7	2349.2	32580	4.19
<i>Sebacinaceae</i>	0.0005	774.7	4576.6	0	391.72	2074	30574	4.18
<i>Sclerodermataceae</i>	0.0010	878.64	26591	1922.4	15532	10360	4815.9	4.11
<i>Pezizaceae</i>	0.0005	0	25380	2408.9	222.48	1083.5	14258	4.1
<i>Magnaporthaceae</i>	0.0023	25234	9320.3	13308	12234	12328	839.77	4.09
<i>Gigasporaceae</i>	0.0005	0	0	292.88	0	3357.9	24282	4.08
<i>Ophiocordycipitaceae</i>	0.0005	1179.2	3392.9	0	0	0	21239	4.03
<i>Clavulinaceae</i>	0.0022	1448.7	7828.5	11764	2521.9	5700.9	20142	3.97
<i>Pacisporaceae</i>	0.0008	108.29	6476.2	772.93	1222.7	602.42	15879	3.9
<i>Pseudeurotiaceae</i>	0.0007	14731	5788	9535.5	95.411	2473.7	13748	3.86
<i>Thelephoraceae</i>	0.0023	920.85	1007.7	2577.9	95.411	3108	14526	3.86
<i>Amanitaceae</i>	0.0005	8633	13052	97.666	0	3508.8	4066.5	3.81
<i>Heterogastridiaceae</i>	0.0024	664.37	4348.3	390.51	1139.7	3580	13132	3.8
<i>Ganodermataceae</i>	0.0005	508.51	2283.9	5072.2	578.83	1553.9	12308	3.77
<i>Clavariaceae</i>	0.0012	198.27	3610.5	3264.3	502.33	2151.9	12098	3.77
<i>Cantharellaceae</i>	0.0006	0	1327.1	7972.7	11446	965.08	0	3.76
<i>Meruliaceae</i>	0.0025	0	1246.7	1335.7	437.09	381.68	11332	3.75
<i>Niaceae</i>	0.0009	108.29	10643	1150.5	1551.3	98.624	6304.1	3.72

<i>Clavicipitaceae</i>	0.0005	10337	0	376.01	0	0	0	3.71
<i>Microascaceae</i>	0.0016	962.17	2749.2	4769.3	385.89	1878.9	10728	3.71
<i>Botryobasidiaceae</i>	0.0010	1094	5127.1	10038	3892.2	972.52	10904	3.7
<i>Tubeufiaceae</i>	0.0005	2117.5	0	0	8463.2	205.95	0	3.63
<i>Chaetosphaeriaceae</i>	0.0129	698.35	1229.9	773.89	1291.6	1465.3	9250.9	3.63
<i>Montagnulaceae</i>	0.0018	2560.3	8356.4	4391.4	703.97	591.66	913.71	3.59
<i>Endochytriaceae</i>	0.0025	597.18	524.72	0	589.78	0	7400.7	3.57
<i>Tetraplospheeriaceae</i>	0.0005	0	1883.7	1734.6	7304.3	0	0	3.56
<i>Inocybaceae</i>	0.0023	198.27	7142.3	2784.6	477.05	1881.2	2353	3.54
<i>Spizellomycetaceae</i>	0.0016	782.12	6237.2	0	1193.1	5946.3	5178	3.49
<i>Leotiaceae</i>	0.0008	0	202.85	6026.8	0	0	3938.1	3.48
<i>Rhizophydiaceae</i>	0.0006	0	5827.6	2212.8	0	886.79	1745.4	3.46
<i>Verrucariaceae</i>	0.0009	0	5763.9	97.666	0	492.21	0	3.46
<i>Hymenochaetaceae</i>	0.0010	0	2194.5	4794.7	111.24	1273.2	3650.2	3.38
<i>Oedogoniomycetaceae</i>	0.0007	0	513.46	95.138	0	0	4485.9	3.35
<i>Alphamycetaceae</i>	0.0005	0	4074.2	0	515.08	982.58	0	3.31
<i>Boliniaceae</i>	0.0018	484.73	0	290.06	0	0	3636.7	3.26
<i>Trichomonascaceae</i>	0.0005	0	0	2878.4	0	3215.3	0	3.21
<i>Ambisporaceae</i>	0.0025	0	933.64	0	0	0	3245	3.21
<i>Hydnaceae</i>	0.0016	0	297.81	3169.5	405.52	294.68	2296.7	3.2
<i>Dacrymycetaceae</i>	0.0033	93.664	733.63	1923.6	0	98.624	3125.3	3.19
<i>Coniochaetaceae</i>	0.0438	1054.5	302.31	1138.9	111.24	3125.5	2302.8	3.18
<i>Halosphaeriaceae</i>	0.0096	108.29	2500.9	2217	103.37	900.26	2569.4	3.09
<i>Bionectriaceae</i>	0.0049	0	1418.9	2385.4	1580.6	205.95	444.84	3.08
<i>Acaulosporaceae</i>	0.0006	2114.1	0	666.4	0	0	0	3.02
<i>Trichosporonaceae</i>	0.0238	0	706.71	851.14	0	0	2115	3.02
<i>Sordariaceae</i>	0.0325	920.85	1056.8	2013.6	1279.2	0	751.86	3
<i>Olpidiaceae</i>	0.0033	1963.2	1326.2	0	705.27	483.51	0	2.99
<i>Agaricaceae</i>	0.0024	0	201.54	1046.2	0	1584.2	1822.1	2.96
<i>Plectosphaerellaceae</i>	0.0035	0	201.54	663.13	95.411	0	1737.1	2.94
<i>Pseudoplagiostomataceae</i>	0.0016	0	0	0	1715.7	295.87	313.9	2.93
<i>Dipodascaceae</i>	0.0005	0	218.47	0	0	1175.4	1613.6	2.91
<i>Bolbitiaceae</i>	0.0011	0	0	670.8	95.411	0	1598.4	2.9
<i>Dothioraceae</i>	0.0005	0	1438.4	0	0	0	1186.4	2.86
<i>Apiosporaceae</i>	0.0008	1281.8	0	94.733	0	789.73	108.21	2.81
<i>Gnomoniaceae</i>	0.0032	0	0	0	1103.6	303.38	309.2	2.74
Total abundance		1406722	6298124	4265498	870721	1957812	3940315	
Selected bacteria/total bacteria		14.07%	62.98%	42.66%	8.71%	19.58%	39.40%	

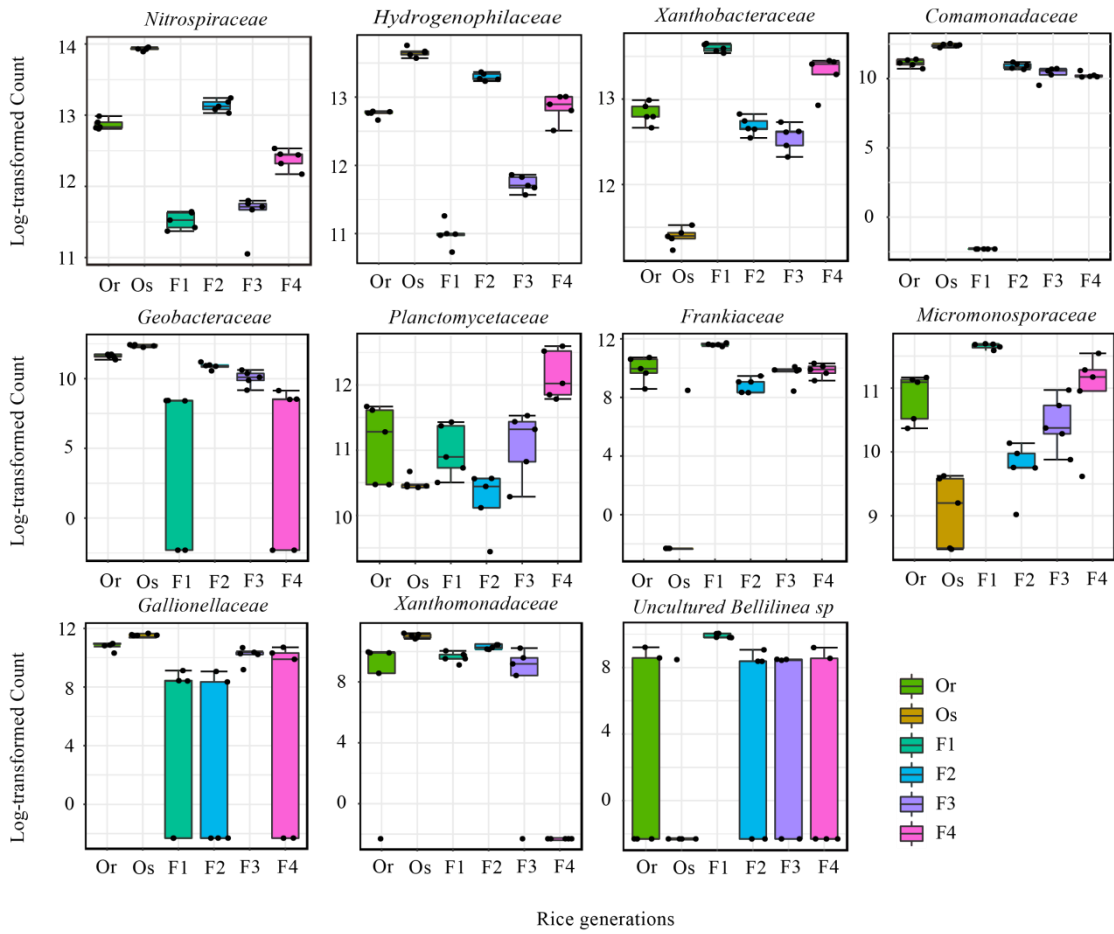


Figure S1. Rhizosphere bacterial communities (family level) affected by wild rice *Oryza rufipogon* (Or) female parent. Rhizosphere of parental wild rice *Oryza rufipogon* (Or), parental cultivated rice *Oryza sativa* (Os) and different hybrid generations of rice progenies (F1) obtained by self-crossing (F2, F3, F4).

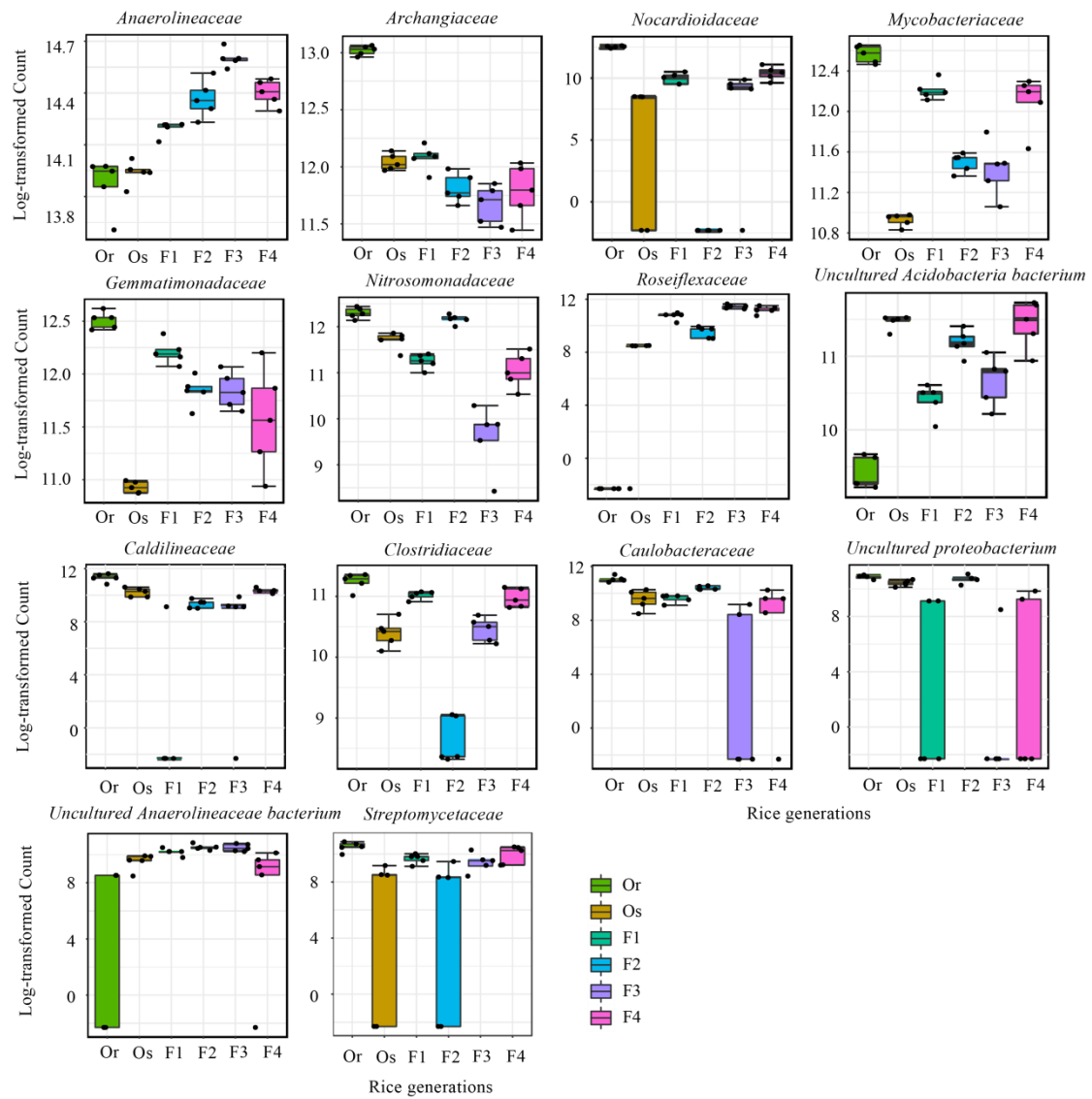


Figure S2. Rhizosphere bacterial communities (family level) affected by cultivated rice *Oryza sativa* (Os) male parent. Rhizosphere of parental wild rice *Oryza rufipogon* (Or), parental cultivated rice *Oryza sativa* (Os) and different hybrid generations of rice progenies (F1) obtained by self-crossing (F2, F3, F4).

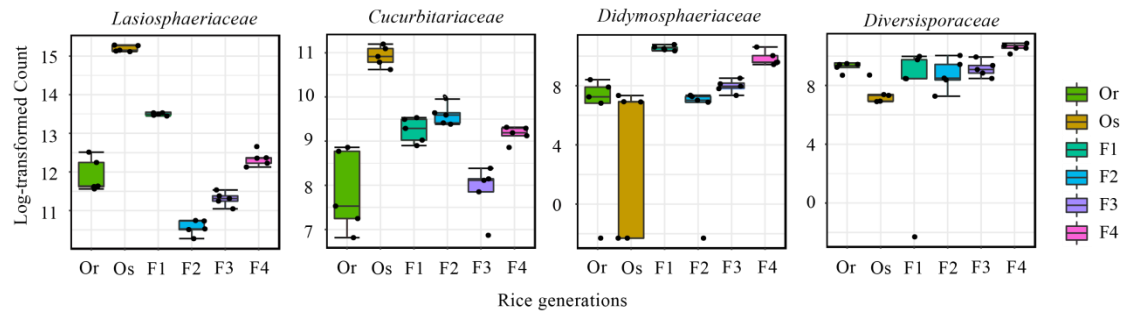


Figure S3. Rhizosphere fungal communities (family level) affected by parental wild rice *Oryza rufipogon* (Or). Rhizosphere of parental wild rice *Oryza rufipogon* (Or), parental cultivated rice *Oryza sativa* (Os) and different hybrid generations of rice progenies (F1) obtained by self-crossing (F2, F3, F4).

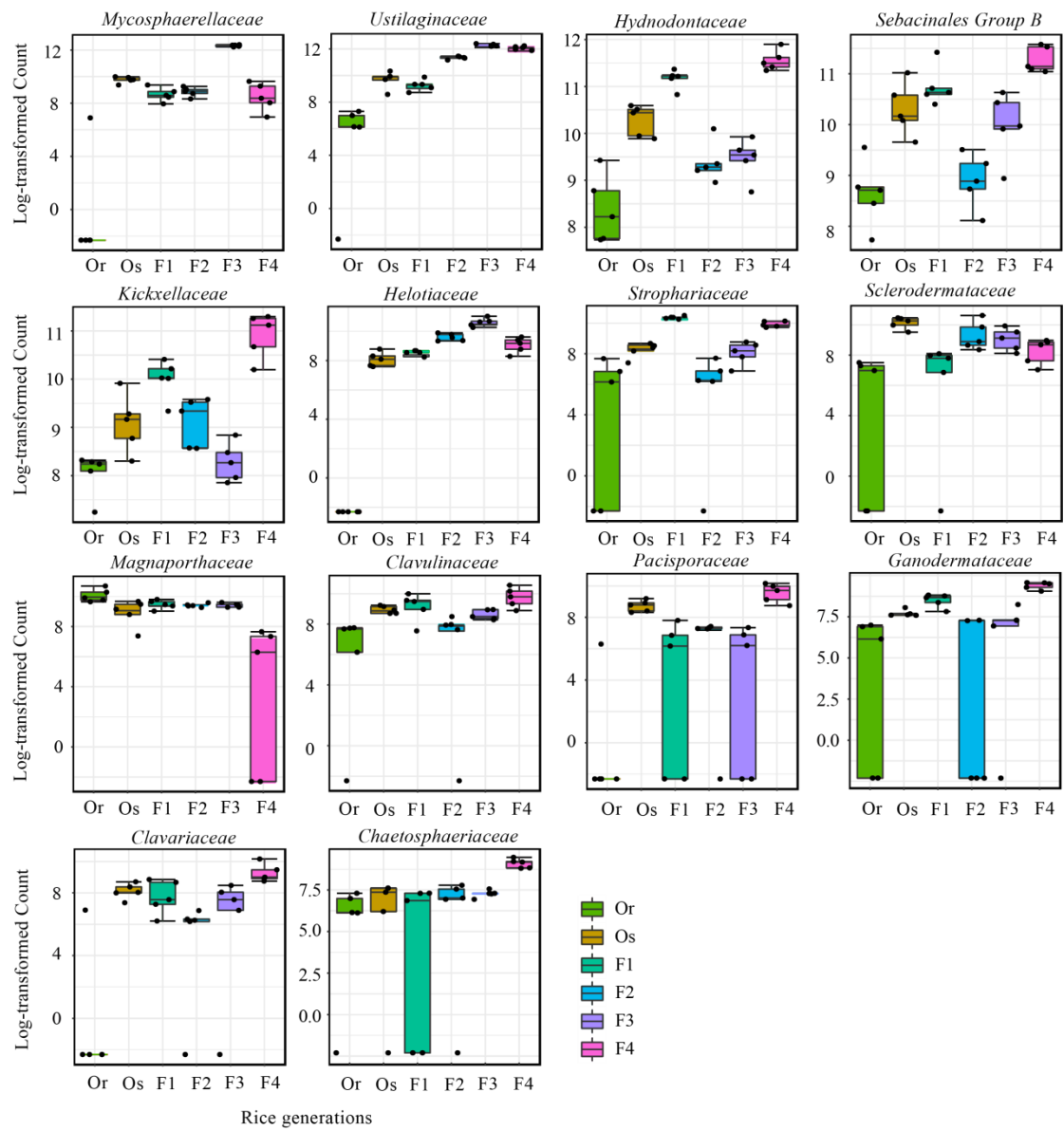


Figure S4. Rhizosphere fungal communities (family level) affected by parental cultivated rice *Oryza sativa* (Os). Rhizosphere of parental wild rice *Oryza rufipogon* (Or), parental cultivated rice *Oryza sativa* (Os) and different hybrid generations of rice progenies (F1) obtained by self-crossing (F2, F3, F4).

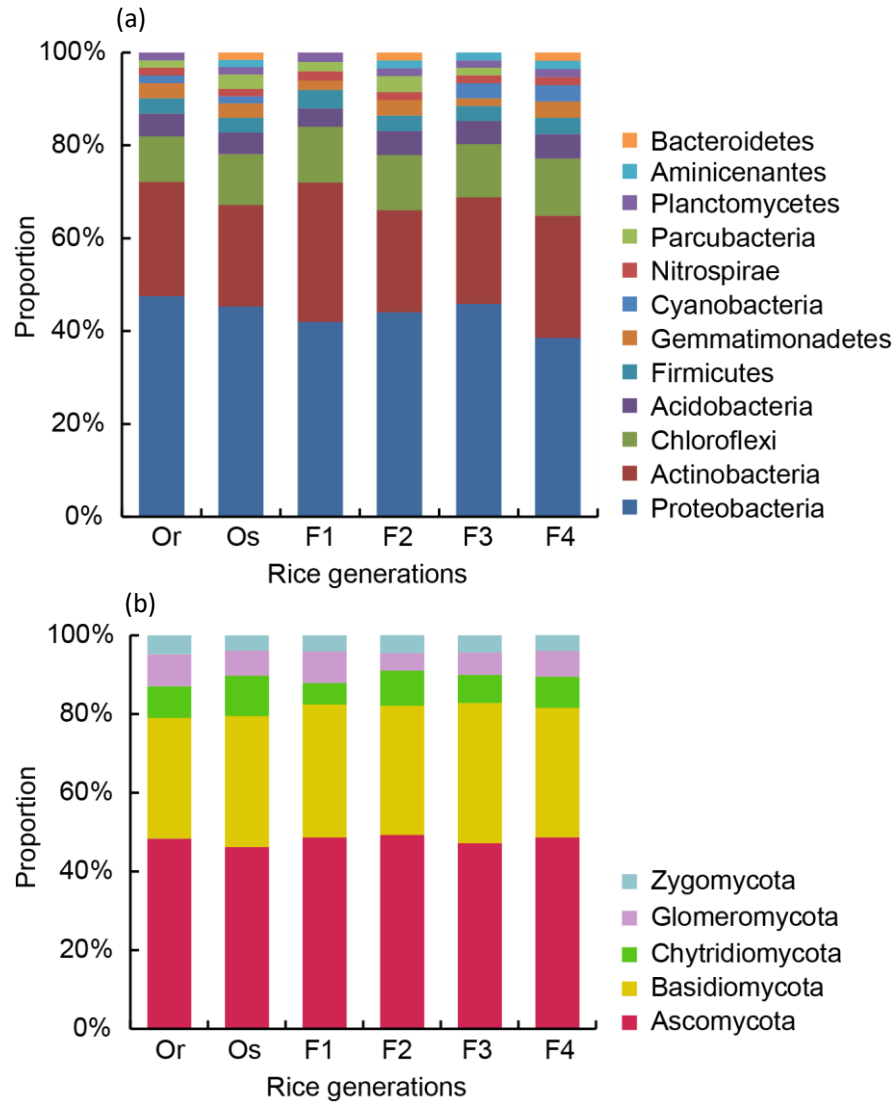


Figure S5. The proportion of the key bacteria family (a) and fungi family (b) affiliated to phylum. Rhizosphere of parental wild rice *Oryza rufipogon* (Or), parental cultivated rice *Oryza sativa* (Os) and different hybrid generations of rice progenies (F1) obtained by self-crossing (F2, F3, F4).