**Table S4.**

Group-level HyDe results for hybridization tests among the five regional groups of *Obovalis*. P1 and P2 indicate the two parental groups specified in each HyDe triple, and "putative hybrid" indicates the group specified as the putative hybrid. Gamma indicates the estimated proportion of ancestry inherited from P1. The *p*-values reported as 0 indicate values below numerical precision in the HyDe output. Focused Shiga-as-hybrid and Kyushu-as-hybrid tests yielded no significant filtered triples with interpretable gamma values. KansaiChugoku corresponds to Kansai–Chugoku.

| Analysis set | P1 | Putative hybrid | P2 | *Z* -score | *p* -value | Gamma | Statistical inference |
|---|---|---|---|---|---|---|---|
| Focused Shiga-as-hybrid | | Shiga | | | | | No significant filtered triples; no HyDe support for the Shiga group as the putative hybrid. |
| Focused Kyushu-as-hybrid | | Kyushu | | | | | No significant filtered triples; no HyDe support for a recent hybrid origin of the Kyushu group, including O-38/O-39. |
| Within *O. omiensis* | Shiga | Tokai | KansaiChugoku | 5.044 | $2.28 \times 10^{-7}$ | 0.553 | Significant non-tree-like signal among regional groups within *O. omiensis*; the group specified as the putative hybrid is Tokai, not Shiga. |
| Within *O. omiensis* | KansaiChugoku | Tokai | Shiga | 5.044 | $2.28 \times 10^{-7}$ | 0.447 | Significant non-tree-like signal among regional groups within *O. omiensis*; the group specified as the putative hybrid is Tokai, not Shiga. |
| Interspecific-focused | Shiga | Tokai | Hokuriku | 5.921 | $1.60 \times 10^{-9}$ | 0.492 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | Hokuriku | Tokai | Shiga | 5.921 | $1.60 \times 10^{-9}$ | 0.508 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | Shiga | Tokai | Kyushu | 6.429 | $6.46 \times 10^{-11}$ | 0.882 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | Kyushu | Tokai | Shiga | 6.429 | $6.46 \times 10^{-11}$ | 0.118 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | KansaiChugoku | Tokai | Hokuriku | 4.48 | $3.73 \times 10^{-6}$ | 0.432 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | Hokuriku | Tokai | KansaiChugoku | 4.48 | $3.73 \times 10^{-6}$ | 0.568 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | KansaiChugoku | Tokai | Kyushu | 5.224 | $8.77 \times 10^{-8}$ | 0.896 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | Kyushu | Tokai | KansaiChugoku | 5.224 | $8.77 \times 10^{-8}$ | 0.104 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | Kyushu | Hokuriku | Shiga | 24.49 | 0 | 0.428 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | Shiga | Hokuriku | Kyushu | 24.49 | 0 | 0.572 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | Kyushu | Hokuriku | Tokai | 21.94 | 0 | 0.371 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | Tokai | Hokuriku | Kyushu | 21.94 | 0 | 0.629 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | Kyushu | Hokuriku | KansaiChugoku | 24.03 | 0 | 0.42 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |
| Interspecific-focused | KansaiChugoku | Hokuriku | Kyushu | 24.03 | 0 | 0.58 | Significant HyDe signal indicating complex allele sharing; strong recent introgression was not corroborated by Dsuite or f3 tests. |