

- Pipeline components:
 - minimap2 was used to align one assembly to another;
 - blat chain/net tools were used to process alignment results and build synteny chains/nets;
 - bcftools and GATK4 were used to call variants;
 - snpEff was used to evaluate variant effects on syntenic genes
- whole genome synteny plots
 - Mo17 vs B73
 - W22 vs B73
 - PH207 vs B73
 - PHB47 vs B73
- Table 1. Whole genome alignment statistics.

| | Mo17 vs B73 | | | | W22 vs B73 | | | | PH207 vs B73 | | | | PHB47 vs B73 | | | |
|-----------------------------------|---------------|--------|---------------|--------|---------------|--------|---------------|--------|---------------|--------|---------------|--------|---------------|--------|---------------|--------|
| | Mo17 | | B73 | | W22 | | B73 | | PH207 | | B73 | | PHB47 | | B73 | |
| | # | % | # | % | # | % | # | % | # | % | # | % | # | % | # | % |
| genome space | 2,204,525,176 | 100.0% | 2,137,643,061 | 100.0% | 2,133,882,028 | 100.0% | 2,137,643,061 | 100.0% | 2,372,587,326 | 100.0% | 2,137,643,061 | 100.0% | 2,164,788,649 | 100.0% | 2,137,643,061 | 100.0% |
| gap-free space | 2,147,450,341 | 97.4% | 2,104,350,193 | 98.4% | 2,093,255,169 | 98.1% | 2,104,350,193 | 98.4% | 1,714,072,453 | 72.2% | 2,104,350,193 | 98.4% | 2,126,513,527 | 98.2% | 2,104,350,193 | 98.4% |
| in synteny | 1,232,534,653 | 57.4% | 1,232,534,653 | 58.6% | 1,253,067,639 | 59.9% | 1,253,067,639 | 59.5% | 1,091,867,114 | 63.7% | 1,091,867,114 | 51.9% | 1,320,582,689 | 62.1% | 1,320,582,689 | 62.8% |
| genic space | 156,283,135 | 7.1% | 164,588,349 | 7.7% | 174,277,885 | 8.2% | 164,588,349 | 7.7% | 243,071,285 | 10.2% | 164,588,349 | 7.7% | 158,226,649 | 7.3% | 164,588,349 | 7.7% |
| genic space in synteny | 125,160,600 | 80.1% | 130,489,534 | 79.3% | 135,146,791 | 77.5% | 130,983,423 | 79.6% | 152,879,810 | 62.9% | 125,238,677 | 76.1% | 131,905,386 | 83.4% | 132,930,266 | 80.8% |
| total genes | 38,620 | | 46,117 | | 40,690 | | 46,117 | | 40,557 | | 46,117 | | 36,988 | | 46,117 | |
| genes w. >=75% covered in synteny | 30,621 | 79.3% | 35,959 | 78.0% | 31,861 | 78.3% | 36,093 | 78.3% | 28,803 | 71.0% | 33,429 | 72.5% | 30,231 | 81.7% | 36,675 | 79.5% |

- Table 2. Summary of variants called by synteny comparison.

| size | Mo17 vs B73 | | | | W22 vs B73 | | | | PH207 vs B73 | | | | PHB47 vs B73 | | | |
|------------------|-------------|---------|------------|--------|------------|---------|------------|--------|--------------|---------|-------------|--------|--------------|---------|------------|--------|
| | #events | %events | #bases | %bases | #events | %events | #bases | %bases | #events | %events | #bases | %bases | #events | %events | #bases | %bases |
| SNP | 9,162,131 | | 9,162,131 | | 8,528,915 | | 8,528,915 | | 7,951,915 | | 7,951,915 | | 7,978,260 | | 7,978,260 | |
| Insertion | 603,210 | | 743,374 | | 570,985 | | 740,415 | | 547,733 | | 754,883 | | 528,952 | | 650,232 | |
| 0-10bp | 509,418 | 84.5% | 509,418 | 68.5% | 464,973 | 81.4% | 464,973 | 62.8% | 415,587 | 75.9% | 415,587 | 55.1% | 447,793 | 84.7% | 447,793 | 68.9% |
| 10-100bp | 66,558 | 11.0% | 133,116 | 17.9% | 62,300 | 10.9% | 124,600 | 16.8% | 73,174 | 13.4% | 146,348 | 19.4% | 57,763 | 10.9% | 115,526 | 17.8% |
| 100bp-1kb | 15,404 | 2.6% | 46,212 | 6.2% | 30,275 | 5.3% | 90,825 | 12.3% | 48,637 | 8.9% | 145,911 | 19.3% | 13,089 | 2.5% | 39,267 | 6.0% |
| 1-5kb | 4,522 | 0.7% | 18,088 | 2.4% | 7,168 | 1.3% | 28,672 | 3.9% | 4,638 | 0.8% | 18,552 | 2.5% | 3,889 | 0.7% | 15,556 | 2.4% |
| 5-10kb | 7,308 | 1.2% | 36,540 | 4.9% | 6,269 | 1.1% | 31,345 | 4.2% | 5,697 | 1.0% | 28,485 | 3.8% | 6,418 | 1.2% | 32,090 | 4.9% |
| Deletion | 720,933 | | 856,324 | | 539,399 | | 672,667 | | 529,120 | | 700,874 | | 496,874 | | 614,928 | |
| 0-10bp | 629,897 | 87.4% | 629,897 | 73.6% | 449,716 | 83.4% | 449,716 | 66.9% | 412,161 | 77.9% | 412,161 | 58.8% | 417,715 | 84.1% | 417,715 | 67.9% |
| 10-100bp | 64,984 | 9.0% | 129,968 | 15.2% | 63,082 | 11.7% | 126,164 | 18.8% | 78,789 | 14.9% | 157,578 | 22.5% | 56,517 | 11.4% | 113,034 | 18.4% |
| 100bp-1kb | 14,788 | 2.1% | 44,364 | 5.2% | 16,087 | 3.0% | 48,261 | 7.2% | 27,415 | 5.2% | 82,245 | 11.7% | 12,657 | 2.5% | 37,971 | 6.2% |
| 1-5kb | 4,225 | 0.6% | 16,900 | 2.0% | 4,044 | 0.7% | 16,176 | 2.4% | 4,885 | 0.9% | 19,540 | 2.8% | 3,717 | 0.7% | 14,868 | 2.4% |
| 5-10kb | 7,039 | 1.0% | 35,195 | 4.1% | 6,470 | 1.2% | 32,350 | 4.8% | 5,870 | 1.1% | 29,350 | 4.2% | 6,268 | 1.3% | 31,340 | 5.1% |
| Mixed | 14,859 | | 28,129,289 | | 23,118 | | 35,050,545 | | 126,434 | | 153,928,948 | | 12,251 | | 22,605,984 | |

- plot of syteny content and variant density
 - Mo17 vs B73
 - W22 vs B73
 - PH207 vs B73
 - PHB47 vs B73
- Table 3. Summary of variant effects on syntenic genes.

| Impact | Effect | Mo17 vs B73 | | | | W22 vs B73 | | | | PH207 vs B73 | | | | PHB47 vs B73 | | | |
|------------------|--|-------------|-------|--------|-------|------------|-------|--------|-------|--------------|-------|-------|-------|--------------|-------|-------|-------|
| | | B73 | | Mo17 | | B73 | | W22 | | B73 | | PH207 | | B73 | | PHB47 | |
| | | # | % | # | % | # | % | # | % | # | % | # | % | # | % | # | % |
| high | exon_loss_variant | 44 | 0.1% | 56 | 0.1% | 57 | 0.1% | 89 | 0.2% | 77 | 0.2% | 206 | 0.5% | 42 | 0.1% | 32 | 0.1% |
| | frameshift_variant | 2,871 | 6.2% | 2,692 | 7.0% | 2,631 | 5.7% | 2,446 | 6.0% | 6,386 | 13.8% | 3,531 | 8.7% | 2,323 | 5.0% | 1,923 | 5.2% |
| | splice_acceptor_variant | 475 | 1.0% | 902 | 2.3% | 469 | 1.0% | 834 | 2.0% | 476 | 1.0% | 742 | 1.8% | 380 | 0.8% | 317 | 0.9% |
| | splice_donor_variant | 596 | 1.3% | 946 | 2.4% | 588 | 1.3% | 736 | 1.8% | 691 | 1.5% | 768 | 1.9% | 490 | 1.1% | 422 | 1.1% |
| | start_lost | 222 | 0.5% | 220 | 0.6% | 255 | 0.6% | 224 | 0.6% | 796 | 1.7% | 261 | 0.6% | 194 | 0.4% | 197 | 0.5% |
| | stop_gained | 675 | 1.5% | 536 | 1.4% | 684 | 1.5% | 1,395 | 3.4% | 758 | 1.6% | 558 | 1.4% | 540 | 1.2% | 360 | 1.0% |
| | stop_lost | 219 | 0.5% | 221 | 0.6% | 225 | 0.5% | 1,200 | 2.9% | 266 | 0.6% | 226 | 0.6% | 197 | 0.4% | 119 | 0.3% |
| | transcript_ablation | | | | | | | | | | | | | 2 | 0.0% | | |
| moderate | conservative_inframe_deletion | 346 | 0.8% | 320 | 0.8% | 330 | 0.7% | 290 | 0.7% | 247 | 0.5% | 401 | 1.0% | 286 | 0.6% | 305 | 0.8% |
| | conservative_inframe_insertion | 493 | 1.1% | 453 | 1.2% | 512 | 1.1% | 367 | 0.9% | 660 | 1.4% | 340 | 0.8% | 422 | 0.9% | 405 | 1.1% |
| | disruptive_inframe_deletion | 630 | 1.4% | 591 | 1.5% | 692 | 1.5% | 556 | 1.4% | 446 | 1.0% | 461 | 1.1% | 533 | 1.2% | 533 | 1.4% |
| | disruptive_inframe_insertion | 530 | 1.1% | 442 | 1.1% | 510 | 1.1% | 417 | 1.0% | 566 | 1.2% | 340 | 0.8% | 418 | 0.9% | 432 | 1.2% |
| | missense_variant | 11,946 | 25.9% | 10,754 | 27.8% | 11,734 | 25.4% | 10,521 | 25.9% | 8,286 | 18.0% | 8,959 | 22.1% | 10,094 | 21.9% | 9,817 | 26.5% |
| low | 5_prime_UTR_premature_start_codon_gain_variant | 62 | 0.1% | 99 | 0.3% | 65 | 0.1% | 80 | 0.2% | 36 | 0.1% | 35 | 0.1% | 51 | 0.1% | 69 | 0.2% |
| | splice_region_variant | 670 | 1.5% | 590 | 1.5% | 704 | 1.5% | 497 | 1.2% | 563 | 1.2% | 640 | 1.6% | 608 | 1.3% | 657 | 1.8% |
| | stop_retained_variant | 7 | 0.0% | 6 | 0.0% | 10 | 0.0% | 9 | 0.0% | 11 | 0.0% | 6 | 0.0% | 5 | 0.0% | 6 | 0.0% |
| | synonymous_variant | 2,016 | 4.4% | 1,873 | 4.8% | 2,068 | 4.5% | 1,529 | 3.8% | 1,428 | 3.1% | 1,726 | 4.3% | 1,819 | 3.9% | 1,807 | 4.9% |
| modifier | 3_prime_UTR_variant | 663 | 1.4% | 647 | 1.7% | 622 | 1.3% | 609 | 1.5% | 455 | 1.0% | 391 | 1.0% | 588 | 1.3% | 873 | 2.4% |
| | 5_prime_UTR_variant | 538 | 1.2% | 538 | 1.4% | 476 | 1.0% | 473 | 1.2% | 515 | 1.1% | 230 | 0.6% | 495 | 1.1% | 604 | 1.6% |
| | intragenic_variant | 1,089 | 2.4% | | | 1,049 | 2.3% | | | 975 | 2.1% | 1 | 0.0% | 913 | 2.0% | 1 | 0.0% |
| | intron_variant | 2,528 | 5.5% | 2,163 | 5.6% | 2,578 | 5.6% | 2,551 | 6.3% | 2,041 | 4.4% | 3,602 | 8.9% | 2,727 | 5.9% | 2,671 | 7.2% |
| | non_coding_transcript_exon_variant | 188 | 0.4% | | | 165 | 0.4% | | | 161 | 0.3% | | | 175 | 0.4% | | |
| no_change | | 9,151 | 19.8% | 6,572 | 17.0% | 9,669 | 21.0% | 7,037 | 17.3% | 7,589 | 16.5% | 5,379 | 13.3% | 13,373 | 29.0% | 8,681 | 23.5% |