**Table S1 (a): Analysis of variance for seed yield and its contributing traits in a set of hybrids generated between *B. carinata* derived *B. juncea* ILs and respective genetic backgrounds along with respective parents in RCBD design**

| | Experiment 1a[#] | | | Coefficient of variation (%) | Experiment 1b[$] | | | Coefficient of variation (%) |
|---|---|---|---|---|---|---|---|---|
| Source | Replications | Treatments | Error | | Replications | Treatments | Error | |
| d.f. | 2 | 54 | 108 | | 2 | 26 | 52 | |
| Mean sum of squares | | | | | | | | |
| Siliqua length (cm) | 0.16 | 0.63** | 0.06 | 6.44 | 0.55** | 0.60** | 0.09 | 7.57 |
| Seeds/Siliqua | 2.83* | 6.02** | 0.74 | 6.43 | 0.25 | 3.04** | 0.56 | 5.67 |
| Total siliqua on main shoot | 187.78** | 52.63** | 15.77 | 7.99 | 1.25 | 85.72** | 11.18 | 6.64 |
| Total number of siliqua/plant | 7600.48* | 5197.65** | 1806.8 | 13.72 | 7570.36* | 8479.64** | 1754.37 | 12.28 |
| Oil content (%) | 28.18** | 13.38** | 1.3 | 3.19 | 28.75** | 6.19** | 0.91 | 2.73 |
| 1,000-seed weight (g) | 0.1 | 0.73** | 0.14 | 8.06 | 0.07 | 1.58** | 0.17 | 8.10 |
| Harvest index (%) | 9.73 | 22.34** | 7.66 | 11.86 | 12.78 | 11.34** | 5.26 | 9.67 |
| Seed yield (t/ha) | 0.1 | 1.37** | 0.09 | 11.91 | 0.02 | 0.58** | 0.08 | 11.33 |

# = including hybrids (D31_ILHs) generated between ILs of DRMRIJ 31 (D31_ILs) and DRMRIJ 31 along with parents

$ = including hybrids (PM30_ILHs) generated between ILs of Pusa Mustard 30 (PM30_ILs) and Pusa Mustard 30 along with parents

* significant at p = 0.1; ** significant at p = 0.05.

**Table S1 (b): Analysis of variance for seed yield and its contributing traits in a set of hybrids generated between *B. carinata* derived *B. juncea* ILs and common tester SEJ 8 along with respective parents in RCBD design**

| | Experiment 4b[#] | | | Coefficient of variation (%) | Experiment 4c[$] | | | Coefficient of variation (%) |
|---|---|---|---|---|---|---|---|---|
| Source | Replications | Treatments | Error | | Replications | Treatments | Error | |
| d.f. | 2 | 27 | 54 | | 2 | 13 | 26 | |
| Mean sum of squares | | | | | | | | |
| Siliqua length (cm) | 0.001 | 0.48** | 0.05 | 4.83 | 0.64** | 0.18** | 0.04 | 4.88 |
| Seeds/Siliqua | 2.41* | 2.95** | 0.54 | 4.93 | 1.69* | 1.27** | 0.35 | 3.99 |
| Total siliqua on main shoot | 6.87 | 40.26** | 10.47 | 5.90 | 35.12* | 39.14** | 6.58 | 5.00 |
| Total number of siliqua/plant | 3615.79 | 5762.89** | 1818.01 | 12.87 | 998.94 | 2612.85** | 835.62 | 9.84 |
| Oil content (%) | 11.77* | 7.78* | 1.76 | 3.39 | 0.69 | 3.18** | 0.781 | 2.32 |
| 1,000-seed weight (g) | 0.04 | 0.34** | 0.09 | 6.72 | 0.19 | 0.55** | 0.07 | 5.62 |
| Harvest index (%) | 9.73 | 14.81** | 5.94 | 11.90 | 17.18 | 7.32 | 6.92 | 10.22 |
| Seed yield (t/ha) | 0.36 | 0.34** | 0.11 | 11.28 | 0.04 | 0.29** | 0.09 | 11.26 |

# = including hybrids (D31_THs) generated between ILs of DRMRIJ 31 (D31_ILs) and SEJ 8 along with parents

$ = including hybrids (PM30_THs) generated between ILs of Pusa Mustard 30 (PM30_ILs) and SEJ 8 along with parents

* significant at p = 0.1; ** significant at p = 0.05.