

**Additional file 1 for “Retrotranspositions in orthologous regions of closely related grass species” by Du et al. BMC Evolutionary Biology #4916306119647011.**

LTR retrotransposons, estimated distances ( $k$ ) between pairs of LTRs, and times of insertion (mya).

| <i>orp1/2</i> region                 |                              |                              |
|--------------------------------------|------------------------------|------------------------------|
| LTRs                                 | $k$ ( $\pm$ SE) <sup>a</sup> | Time (95% C.I.) <sup>b</sup> |
| maize chromosome 4S ( <i>orp1</i> )  |                              |                              |
| <i>Cinful-1</i>                      | 0.009 ( $\pm$ 0.004)         | 0.346 ( $\pm$ 0.300)         |
| <i>Cinful-2</i>                      | 0.023 ( $\pm$ 0.006)         | 0.885 ( $\pm$ 0.450)         |
| <i>Cinful-3</i>                      | 0.060 ( $\pm$ 0.010)         | 2.308 ( $\pm$ 0.750)         |
| <i>Huck-1</i>                        | 0.046 ( $\pm$ 0.006)         | 1.769 ( $\pm$ 0.450)         |
| <i>Huck-2</i>                        | 0.028 ( $\pm$ 0.004)         | 1.077 ( $\pm$ 0.300)         |
| <i>Huck-3</i>                        | 0.030 ( $\pm$ 0.005)         | 1.154 ( $\pm$ 0.375)         |
| <i>Ji-1</i>                          | 0.020 ( $\pm$ 0.006)         | 0.769 ( $\pm$ 0.450)         |
| <i>Ji-2</i>                          | 0.003 ( $\pm$ 0.002)         | 0.115 ( $\pm$ 0.150)         |
| <i>Ji-3</i>                          | 0.002 ( $\pm$ 0.001)         | 0.077 ( $\pm$ 0.075)         |
| <i>Ji-4</i>                          | 0.003 ( $\pm$ 0.002)         | 0.115 ( $\pm$ 0.150)         |
| <i>Opie-1</i>                        | 0.005 ( $\pm$ 0.002)         | 0.192 ( $\pm$ 0.150)         |
| <i>Opie-2</i>                        | 0.007 ( $\pm$ 0.003)         | 0.269 ( $\pm$ 0.225)         |
| <i>Opie-3</i>                        | 0.017 ( $\pm$ 0.004)         | 0.654 ( $\pm$ 0.300)         |
| <i>Grande</i>                        | 0.019 ( $\pm$ 0.006)         | 0.731 ( $\pm$ 0.450)         |
| <i>Milt</i>                          | 0.047 ( $\pm$ 0.000)         | 1.808 ( $\pm$ 0.000)         |
| <i>Prem-1-1</i>                      | 0.119 ( $\pm$ 0.012)         | 4.577 ( $\pm$ 0.900)         |
| <i>Prem-1-2</i>                      | 0.013 ( $\pm$ 0.004)         | 0.500 ( $\pm$ 0.300)         |
| <i>Zeon-1</i>                        | 0.021 ( $\pm$ 0.006)         | 0.808 ( $\pm$ 0.450)         |
| maize chromosome 10S ( <i>orp2</i> ) |                              |                              |
| <i>Ji-3</i>                          | 0.065 ( $\pm$ 0.008)         | 2.500 ( $\pm$ 0.600)         |
| <i>Milt-1</i>                        | 0.010 ( $\pm$ 0.004)         | 0.385 ( $\pm$ 0.300)         |
| <i>Opie</i>                          | 0.008 ( $\pm$ 0.003)         | 0.308 ( $\pm$ 0.225)         |
| <i>Prem-1</i>                        | 0.005 ( $\pm$ 0.002)         | 0.192 ( $\pm$ 0.150)         |
| <i>Ji-4</i>                          | 0.007 ( $\pm$ 0.002)         | 0.269 ( $\pm$ 0.150)         |
|                                      | 0.004 ( $\pm$ 0.000)         | 0.154 ( $\pm$ 0.000)         |
| <i>Huck-2</i>                        | 0.051 ( $\pm$ 0.000)         | 1.962 ( $\pm$ 0.000)         |
| <i>Milt-2</i>                        | 0.082 ( $\pm$ 0.010)         | 3.154 ( $\pm$ 0.750)         |
| rice chromosome 8                    |                              |                              |
| unclassified                         | 0.007 ( $\pm$ 0.003)         | 0.269 ( $\pm$ 0.225)         |
| <i>Ty1-copia-like</i>                | 0.007 ( $\pm$ 0.003)         | 0.269 ( $\pm$ 0.225)         |
| <i>OLDISREP</i>                      | 0.031 ( $\pm$ 0.005)         | 1.192 ( $\pm$ 0.375)         |
| <i>Dagul</i>                         | 0.099 ( $\pm$ 0.011)         | 3.808 ( $\pm$ 0.825)         |
| <i>Ty2-gypsy-like</i>                | 0.002 ( $\pm$ 0.002)         | 0.077 ( $\pm$ 0.150)         |

|                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| <i>Ty2-gypsy-like</i> | 0.002 ( $\pm 0.002$ ) | 0.077 ( $\pm 0.150$ ) |
|-----------------------|-----------------------|-----------------------|

| <i>rl/bl</i> region                |                       |                       |
|------------------------------------|-----------------------|-----------------------|
| LTRs                               | k ( $\pm$ SE)         | Time (95% C.I.)       |
| maize chromosome 10L ( <i>rl</i> ) |                       |                       |
| <i>Opie-3</i>                      | 0.005 ( $\pm 0.002$ ) | 0.188 ( $\pm 0.150$ ) |
| <i>Ji-7</i>                        | 0.017 ( $\pm 0.004$ ) | 0.662 ( $\pm 0.278$ ) |
| <i>Ji-5</i>                        | 0.000 ( $\pm 0.000$ ) | 0.000 ( $\pm 0.000$ ) |
| <i>Ji-6</i>                        | 0.023 ( $\pm 0.005$ ) | 0.892 ( $\pm 0.338$ ) |
| <i>Opie-2</i>                      | 0.022 ( $\pm 0.005$ ) | 0.831 ( $\pm 0.368$ ) |
| <i>Huck-2</i>                      | 0.032 ( $\pm 0.004$ ) | 1.215 ( $\pm 0.323$ ) |
| <i>Ji-4</i>                        | 0.017 ( $\pm 0.004$ ) | 0.650 ( $\pm 0.278$ ) |
| <i>Ji-3</i>                        | 0.002 ( $\pm 0.001$ ) | 0.088 ( $\pm 0.098$ ) |
| <i>Tekay-like</i>                  | 0.023 ( $\pm 0.003$ ) | 0.885 ( $\pm 0.218$ ) |
| <i>Fasu</i>                        | 0.000 ( $\pm 0.000$ ) | 0.000 ( $\pm 0.000$ ) |
| <i>TIM</i>                         | 0.070 ( $\pm 0.017$ ) | 2.688 ( $\pm 1.305$ ) |
| <i>Opie-1</i>                      | 0.023 ( $\pm 0.005$ ) | 0.885 ( $\pm 0.338$ ) |
| <i>Ji-2</i>                        | 0.001 ( $\pm 0.001$ ) | 0.023 ( $\pm 0.045$ ) |
| <i>Fourf</i>                       | 0.009 ( $\pm 0.003$ ) | 0.362 ( $\pm 0.218$ ) |
| maize chromosome 2S ( <i>bl</i> )  |                       |                       |
| <i>Huck-3</i>                      | 0.014 ( $\pm 0.003$ ) | 0.523 ( $\pm 0.210$ ) |
| <i>Huck-5</i>                      | 0.008 ( $\pm 0.002$ ) | 0.292 ( $\pm 0.173$ ) |
| <i>Huck-4</i>                      | 0.011 ( $\pm 0.003$ ) | 0.423 ( $\pm 0.188$ ) |
| <i>Ji-9</i>                        | 0.019 ( $\pm 0.004$ ) | 0.738 ( $\pm 0.270$ ) |
| <i>Ji-10</i>                       | 0.009 ( $\pm 0.003$ ) | 0.331 ( $\pm 0.195$ ) |
| <i>Opie-4</i>                      | 0.053 ( $\pm 0.007$ ) | 2.046 ( $\pm 0.495$ ) |
| <i>Huck-7</i>                      | 0.008 ( $\pm 0.002$ ) | 0.312 ( $\pm 0.165$ ) |
| <i>Milt</i>                        | 0.043 ( $\pm 0.008$ ) | 1.662 ( $\pm 0.608$ ) |
| rice chromosome 4                  |                       |                       |
| <i>Huck</i>                        | 0.006 ( $\pm 0.002$ ) | 0.231 ( $\pm 0.150$ ) |
| <i>Tekay</i>                       | 0.021 ( $\pm 0.002$ ) | 0.808 ( $\pm 0.150$ ) |

***c1/pl1* region**

| LTRs                               | k ( $\pm$ SE)        | Time (95% C.I.)      |
|------------------------------------|----------------------|----------------------|
| maize chromosome 9S ( <i>c1</i> )  |                      |                      |
| <i>Huck-1</i>                      | 0.028 ( $\pm$ 0.005) | 1.077 ( $\pm$ 0.375) |
| <i>Opie-1</i>                      | 0.023 ( $\pm$ 0.004) | 0.885 ( $\pm$ 0.300) |
| <i>Prem-1</i>                      | 0.000 ( $\pm$ 0.000) | 0.000 ( $\pm$ 0.000) |
| <i>Opie-2</i>                      | 0.023 ( $\pm$ 0.004) | 0.885 ( $\pm$ 0.300) |
| <i>Huck-2</i>                      | 0.013 ( $\pm$ 0.003) | 0.500 ( $\pm$ 0.225) |
| <i>Giepum</i>                      | 0.009 ( $\pm$ 0.002) | 0.346 ( $\pm$ 0.150) |
| <i>Opie-3</i>                      | 0.015 ( $\pm$ 0.004) | 0.577 ( $\pm$ 0.300) |
| <i>Huck 3</i>                      | 0.010 ( $\pm$ 0.003) | 0.385 ( $\pm$ 0.225) |
| <i>Cinful</i>                      | 0.009 ( $\pm$ 0.002) | 0.346 ( $\pm$ 0.150) |
| <i>Opie-4</i>                      | 0.001 ( $\pm$ 0.001) | 0.038 ( $\pm$ 0.075) |
| <i>Ji</i>                          | 0.000 ( $\pm$ 0.000) | 0.000 ( $\pm$ 0.000) |
| maize chromosome 6L ( <i>pl1</i> ) |                      |                      |
| <i>Ji-1</i>                        | 0.031 ( $\pm$ 0.006) | 1.192 ( $\pm$ 0.450) |
| <i>Huck</i>                        | 0.030 ( $\pm$ 0.004) | 1.154 ( $\pm$ 0.300) |
| <i>Dagaf</i>                       | 0.022 ( $\pm$ 0.003) | 0.846 ( $\pm$ 0.225) |
| <i>Ji-2</i>                        | 0.010 ( $\pm$ 0.003) | 0.385 ( $\pm$ 0.225) |
| <i>Ji-3</i>                        | 0.039 ( $\pm$ 0.006) | 1.500 ( $\pm$ 0.450) |
| <i>Ji-4</i>                        | 0.003 ( $\pm$ 0.002) | 0.115 ( $\pm$ 0.150) |
| <i>Ji-5</i>                        | 0.017 ( $\pm$ 0.005) | 0.654 ( $\pm$ 0.375) |
| <i>Fourf</i>                       | 0.017 ( $\pm$ 0.004) | 0.654 ( $\pm$ 0.300) |
| <i>Opie</i>                        | 0.003 ( $\pm$ 0.002) | 0.115 ( $\pm$ 0.150) |
| sorghum                            |                      |                      |
| <i>Kuheob</i>                      | 0.008 ( $\pm$ 0.004) | 0.308 ( $\pm$ 0.300) |
| <i>Deiho</i>                       | 0.017 ( $\pm$ 0.004) | 0.654 ( $\pm$ 0.300) |

| <b><i>tb</i> region</b>            |                      |                      |
|------------------------------------|----------------------|----------------------|
| LTRs                               | k ( $\pm$ SE)        | Time (95% C.I.)      |
| maize chromosome 1L ( <i>tb1</i> ) |                      |                      |
| <i>Eninu</i>                       | 0.004 ( $\pm$ 0.002) | 0.154 ( $\pm$ 0.150) |
| <i>Grande</i>                      | 0.002 ( $\pm$ 0.002) | 0.077 ( $\pm$ 0.150) |
| <i>Hopscotch</i>                   | 0.009 ( $\pm$ 0.006) | 0.346 ( $\pm$ 0.450) |
| <i>Huck</i>                        | 0.035 ( $\pm$ 0.005) | 1.346 ( $\pm$ 0.375) |
| <i>Ji</i>                          | 0.003 ( $\pm$ 0.002) | 0.115 ( $\pm$ 0.150) |
| <i>Milt</i>                        | 0.020 ( $\pm$ 0.005) | 0.769 ( $\pm$ 0.375) |
| <i>Yemi</i>                        | 0.000 ( $\pm$ 0.000) | 0.000 ( $\pm$ 0.000) |
| <i>Zeon-1</i>                      | 0.001 ( $\pm$ 0.001) | 0.038 ( $\pm$ 0.075) |
| <i>Zeon-2</i>                      | 0.077 ( $\pm$ 0.012) | 2.962 ( $\pm$ 0.900) |
| maize chromosome 5S ( <i>tb2</i> ) |                      |                      |
| <i>Bogu</i>                        | 0.002 ( $\pm$ 0.002) | 0.077 ( $\pm$ 0.150) |
| <i>Cinful</i>                      | 0.006 ( $\pm$ 0.003) | 0.231 ( $\pm$ 0.225) |
| <i>Ovamef</i>                      | 0.015 ( $\pm$ 0.007) | 0.577 ( $\pm$ 0.525) |
| <i>Prem-1</i>                      | 0.013 ( $\pm$ 0.003) | 0.500 ( $\pm$ 0.225) |
| <i>Zeon</i>                        | 0.005 ( $\pm$ 0.003) | 0.192 ( $\pm$ 0.225) |
| sorghum                            |                      |                      |
| <i>Grande</i>                      | 0.007 ( $\pm$ 0.004) | 0.269 ( $\pm$ 0.300) |

| <i>tbp</i> region                   |                      |                      |
|-------------------------------------|----------------------|----------------------|
| LTRs                                | k ( $\pm$ SE)        | Time (95% C.I.)      |
| maize chromosome 1L ( <i>tbp1</i> ) |                      |                      |
| <i>Huck-1</i>                       | 0.040 ( $\pm$ 0.006) | 1.538 ( $\pm$ 0.450) |
| <i>Huck-2</i>                       | 0.005 ( $\pm$ 0.002) | 0.192 ( $\pm$ 0.150) |
| <i>Huck-3</i>                       | 0.045 ( $\pm$ 0.006) | 1.731 ( $\pm$ 0.450) |
| <i>Ji-1</i>                         | 0.009 ( $\pm$ 0.003) | 0.346 ( $\pm$ 0.225) |
| <i>Ji-2</i>                         | 0.015 ( $\pm$ 0.006) | 0.577 ( $\pm$ 0.450) |
| <i>Opie</i>                         | 0.044 ( $\pm$ 0.006) | 1.692 ( $\pm$ 0.450) |
| <i>Rire</i>                         | 0.009 ( $\pm$ 0.003) | 0.346 ( $\pm$ 0.225) |
| maize chromosome 5S ( <i>tbp2</i> ) |                      |                      |
| <i>Huck</i>                         | 0.036 ( $\pm$ 0.005) | 1.385 ( $\pm$ 0.375) |
| <i>Opie-1</i>                       | 0.002 ( $\pm$ 0.001) | 0.077 ( $\pm$ 0.075) |
| <i>Ji-1</i>                         | 0.011 ( $\pm$ 0.005) | 0.423 ( $\pm$ 0.375) |
| <i>Opie-2</i>                       | 0.041 ( $\pm$ 0.006) | 1.577 ( $\pm$ 0.450) |
| <i>Ji-2</i>                         | 0.035 ( $\pm$ 0.007) | 1.346 ( $\pm$ 0.525) |
| <i>Giepum-1</i>                     | 0.024 ( $\pm$ 0.006) | 0.923 ( $\pm$ 0.450) |
| <i>Opie-3</i>                       | 0.004 ( $\pm$ 0.002) | 0.154 ( $\pm$ 0.150) |
| rice chromosome 3                   |                      |                      |
| Ty3-gypsy-like                      | 0.026 ( $\pm$ 0.008) | 1.000 ( $\pm$ 0.600) |

<sup>a</sup> The estimated distance of the LTR termini (*k*), based on Kimura's two-parameter model (K2P), and its standard deviation (SE) as described in Kumar et al. (2001).

<sup>b</sup> The estimated time of LTR retrotransposon insertion in millions of years ago and the 95% confidence interval (C.I.).