

**Table S1.** List of LTR retrotransposons used as references for the phylogenetic analysis.

|             |                     | Clades                                   | Reference LTR retrotransposons                | Host organism                            | Genbank accession  | Reference                                 |
|-------------|---------------------|--|---|--|--|---|
| Superfamily | Copia               | Sire/Maximus                             | <i>Endovir1_1</i>                             | <i>Arabidopsis thaliana</i>              | AY016208   | Llorens et al., 2011                      |
|             |                     |  | <i>SIRE1_4</i>                                | <i>Glycine max</i>                       | AY205608   | Llorens et al., 2011                      |
|             |                     |  | <i>CopiaSL_17</i>                             | <i>Solanum lycopersicum</i> <sup>†</sup> | LC012653   | Paz et al., 2017                          |
|             |                     |  | <i>ToRTL1/CopiaSL_19</i>                      | <i>Solanum lycopersicum</i> <sup>†</sup> | U68072   | Llorens et al., 2011;<br>Paz et al., 2017 |
|             |                     |  | <i>ATCopia58_At</i>                           | <i>Arabidopsis thaliana</i>              | -  | Wicker & Leller, 2007                     |
|             |                     |  | <i>COPIO_Os</i>                               | <i>Oryza sativum</i>                     | -  | Wicker & Leller, 2007                     |
|             |                     |  | <i>Osr8_Os</i>                                | <i>Oryza sativum</i>                     | -  | Wicker & Leller, 2007                     |
|             |                     | Oryco/Ivana                              | <i>Araco</i>                                  | <i>Arabidopsis thaliana</i>              | AC079131:14472..19329                                      | Llorens et al., 2011                      |
|             |                     |  | <i>Vitico1_1</i>                              | <i>Vitis vitivinifera</i>                | AM465428:1471..6116  | Llorens et al., 2011                      |
|             |                     |  | <i>ATCopia78_At</i>                           | <i>Arabidopsis thaliana</i>              | -  | Wicker & Leller, 2007                     |
|             |                     |  | <i>HORPIA2Tr</i>                              | <i>Triticum aestivum</i>                 | -  | Wicker & Leller, 2007                     |
|             |                     |  | <i>CopiaSL_21</i>                             | <i>Solanum lycopersicum</i> <sup>†</sup> | LC012681   | Paz et al., 2017                          |
|             |                     |  | <i>CopiaSL_23</i>                             | <i>Solanum lycopersicum</i> <sup>†</sup> | LC012631   | Paz et al., 2017                          |
|             | Retrofit/Ale        | <i>Koala</i>                             | <i>Oryza australiensis</i>                    | DQ365823                                 | Llorens et al., 2011                                       |   |
|             |                     | <i>Melmoth</i>                           | <i>Arabidopsis thaliana</i>                   | AC007134                                 | Llorens et al., 2011                                       |   |
|             |                     | <i>AleTrA</i>                            | <i>Triticum aestivum</i>                      | AY485644:c291650..296700                 | Wicker & Leller, 2007                                      |   |
|             |                     | <i>CopiaSL_15</i>                        | <i>Solanum lycopersicum</i> <sup>†</sup>      | LC012613                                 | Paz et al., 2017   |   |
|             |                     | <i>CopiaSL_05</i>                        | <i>Solanum lycopersicum</i> <sup>†</sup>      | LC012694                                 | Paz et al., 2017   |   |
|             | Tork/GMR            | <i>Tnt_1</i>                             | <i>Nicotiana tabacum</i> <sup>†</sup>         | X13777                                   | Llorens et al., 2011                                       |   |
|             |                     | <i>Tto1</i>                              | <i>Nicotiana tabacum</i> <sup>†</sup>         | D83003                                   | Llorens et al., 2011                                       |   |
|             |                     | <i>T135/CopiaSL_33</i>                   | <i>Solanum lycopersicum</i> <sup>†</sup>      | LC012700                                 | Tam et al., 2005;<br>Paz et al., 2017                      |   |
|             |                     | <i>CopiaSL_30</i>                        | <i>Solanum lycopersicum</i> <sup>†</sup>      | LC012680                                 | Paz et al., 2017   |   |
|             |                     | <i>Tork4/CopiaSL_37</i>                  | <i>Solanum lycopersicum</i> <sup>†</sup>      | EU105455                                 | Llorens et al., 2011;<br>Paz et al., 2017                  |   |
|             | Angela/Tork         | <i>AngelaTr</i>                          | <i>Triticum aestivum</i>                      | -  | Wicker & Leller, 2007                                      |   |
|             |                     | <i>IkerosTr</i>                          | <i>Triticum aestivum</i>                      | -  | Wicker & Leller, 2007                                      |   |
|             |                     | <i>CopiaSL_monotypic/Ch12_2s29</i>       | <i>Solanum lycopersicum</i> <sup>†</sup>      | LC012705                                 | Paz et al., 2017   |   |
| Tar/Tork    | <i>ATCopia95_At</i> | <i>Arabidopsis thaliana</i>              | -   | Wicker & Leller, 2007                    |  |   |
|             | <i>Houba_Os</i>     | <i>Oryza sativum</i>                     | -   | Wicker & Leller, 2007                    |  |   |
|             | <i>CopiaSL_26</i>   | <i>Solanum lycopersicum</i> <sup>†</sup> | LC012654                                      | Paz et al., 2017                         |  |   |
|             | <i>CopiaSL_28</i>   | <i>Solanum lycopersicum</i> <sup>†</sup> | LC012682                                      | Paz et al., 2017                         |  |   |
| Bianca      | <i>Beyla_Os</i>     | <i>Oryza sativum</i>                     | -   | Wicker & Leller, 2007                    |  |   |
|             | <i>CopiaSL_25</i>   | <i>Solanum lycopersicum</i> <sup>†</sup> | LC012648                                      | Paz et al., 2017                         |  |   |
|             | <i>CopiaSL_38</i>   | <i>Solanum lycopersicum</i> <sup>†</sup> | LC012625                                      | Paz et al., 2017                         |  |   |
| Gypsy       | Athila              | <i>Cyclops-2</i>                         | <i>Pisum sativum</i>                          | AJ000640                                 | Llorens et al., 2011                                       |   |
|             |                     | <i>Athila4-1</i>                         | <i>Arabidopsis thaliana</i>                   | AC007209:8571-22122                      | Llorens et al., 2011                                       |   |
|             |                     | <i>Diapsora</i>                          | <i>Glycine max</i>                            | AF095730                                 | Llorens et al., 2011                                       |   |
|             |                     | <i>GypsySL_04</i>                        | <i>Solanum lycopersicum</i> <sup>†</sup>      | LC012620                                 | Paz et al., 2017   |   |
|             | Tat                 | <i>Tat4-1</i>                            | <i>Arabidopsis thaliana</i>                   | AB005247.2:20968-32865                   | Llorens et al., 2011                                       |   |
|             |                     | <i>Ogre</i>                              | <i>Pisum sativum</i>                          | AY299398.1:14501-37253                   | Llorens et al., 2011                                       |   |
|             |                     | <i>GypsySL_06</i>                        | <i>Solanum lycopersicum</i> <sup>†</sup>      | LC012687                                 | Paz et al., 2017   |   |
|             |                     | <i>GypsySL_12</i>                        | <i>Solanum lycopersicum</i> <sup>†</sup>      | LC012699                                 | Paz et al., 2017   |   |
|             | Reina               | <i>Reina</i>                             | <i>Zea mays</i>                               | U69258                                   | Llorens et al., 2011                                       |   |
|             |                     | <i>Gloin</i>                             | <i>Arabidopsis thaliana</i>                   | AC007188.7:22520-27933                   | Llorens et al., 2011                                       |   |
|             |                     | <i>Ilg7</i>                              | <i>Pinus radiata</i>                          | AJ004945                                 | Llorens et al., 2011                                       |   |
|             |                     | <i>GypsySL_monotypic/Ch03_1s10</i>       | <i>Solanum lycopersicum</i> <sup>†</sup>      | LC012634                                 | Paz et al., 2017   |   |
|             |                     | <i>GypsySL_monotypic/Ch12_1s55</i>       | <i>Solanum lycopersicum</i> <sup>†</sup>      | LC012702                                 | Paz et al., 2017   |   |
|             | CRM                 | <i>Cereba</i>                            | <i>Hordeum vulgare</i>                        | AF078801                                 | Llorens et al., 2011                                       |   |
|             |                     | <i>CRM</i>                               | <i>Zea mays</i>                               | AY129008                                 | Llorens et al., 2011                                       |   |
|             |                     | <i>Beetle1</i>                           | <i>Beta vulgaris</i>                          | AJ539424                                 | Llorens et al., 2011                                       |   |
|             | Galadriel           | <i>GYLES1_1/Galadriel/GypsySL_10</i>     | <i>Solanum lycopersicum</i> <sup>†</sup>      | LC012667                                 | Parniske et al., 1999<br>Llorens et al., 2011; Paz et al., |   |
|             |                     | <i>Tntom1</i>                            | <i>Nicotiana tomentosiformis</i> <sup>†</sup> | AJ508603                                 | Llorens et al., 2011                                       |   |

|  |                            |   |                        |                                  |
|--|----------------------------|---|------------------------|----------------------------------|
|  | <i>GypsySL_11</i>          | <i>Solanum lycopersicum</i> <sup>†</sup>                              | LC012622               | Paz et al., 2017                 |
|  | <i>Tma</i>                 | <i>Arabidopsis thaliana</i>   | AC005398.3:43778-51134 | Llorens et al., 2011             |
|  | <i>Del</i>                 | <i>Lilium henryi</i>  | X13886                 | Llorens et al., 2011             |
|  | <i>GypsySL_01</i>          | <i>Solanum lycopersicum</i> <sup>†</sup>                              | LC012636               | Paz et al., 2017                 |
|  | <i>GypsySL_03</i>          | <i>Solanum lycopersicum</i> <sup>†</sup>                              | LC012612               | Paz et al., 2018                 |
|  | <i>GypsySL_05</i>          | <i>Solanum lycopersicum</i> <sup>†</sup>                              | LC012641               | Paz et al., 2019                 |
|  | <i>GYPNODE1/GypsySL_07</i> | <i>Solanum demissum</i> /<br><i>Solanum lycopersicum</i> <sup>†</sup> | LC012641               | Jurka, 2005;<br>Paz et al., 2017 |

<sup>†</sup> Retroelements identified and described in organisms belonging to the family Solanaceae