

List of independent C-to-T losses in angiosperm evolution at *matK* editing sites

| Group          | Genus <sup>a</sup>                 | Genera<br>at sn<br>(T/C) <sup>b</sup> | Genera<br>at an1<br>(T/C) <sup>b</sup> | Genera<br>at an2<br>(T/C) <sup>b</sup> | Mixed Genera                       |                               |                                         |
|----------------|------------------------------------|---------------------------------------|----------------------------------------|----------------------------------------|------------------------------------|-------------------------------|-----------------------------------------|
|                |                                    |                                       |                                        |                                        | equal<br>number<br>of Ts<br>and Cs | more Cs<br>than Ts<br>(C/T)   | more Ts<br>than Cs<br>(T/C)             |
| <i>matK-2</i>  |                                    |                                       |                                        |                                        |                                    |                               |                                         |
| Rosids         | <i>Boehmeria</i>                   | 0/5                                   | 0/1                                    | 0/2                                    | <i>Rhamnus</i><br>(1/1)            | <i>Juglans</i><br>(11/1)      |                                         |
|                | <i>Tropaeolum</i>                  | 1/7                                   | 2/17                                   | 0/1                                    |                                    |                               |                                         |
|                | <i>Batis</i>                       | 0/1                                   | 0/3                                    | 0/2                                    |                                    |                               |                                         |
|                | <i>Sterculia</i>                   | 0/3                                   | 0/1                                    | 0/1                                    |                                    |                               |                                         |
| Asterids       | <i>Helianthus/Tagetes</i>          | 0/1                                   | 0/1                                    | 0/2                                    | <i>Plantago</i><br>(1/1)           | <i>Utricularia</i><br>(25/1)  | <i>Valeriana</i><br>(1/22) <sup>c</sup> |
|                | <i>Apium</i>                       | 0/1                                   | 0/2                                    | 0/1                                    |                                    | <i>Gilia</i> (14/1)           |                                         |
|                | <i>Streptocarpus</i>               | 0/1                                   | 0/2                                    | 0/12                                   |                                    |                               |                                         |
|                | <i>Eurya/Ternstroemia</i>          | 0/6                                   | 0/4                                    | 0/1                                    |                                    |                               |                                         |
| Basal Eudicots | <i>Buxus</i>                       | 17/87                                 | 0/1                                    | 1/9                                    |                                    |                               |                                         |
|                | <i>Nandina</i>                     | 0/1                                   | 0/4                                    | 0/1                                    |                                    |                               |                                         |
| Magnoliids     | <i>Gyrocarpus</i>                  | 0/3                                   | 0/2                                    | 0/11                                   |                                    |                               |                                         |
|                | <i>Saururus</i>                    | 0/1                                   | 0/3                                    | 1/17                                   |                                    |                               |                                         |
| <b>total</b>   |                                    | <b>12</b>                             |                                        |                                        |                                    | <b>5</b>                      | <b>1</b>                                |
| <i>matK-3</i>  |                                    |                                       |                                        |                                        |                                    |                               |                                         |
| Rosids         | <i>Coriaria</i>                    | 0/1                                   | 0/7                                    | 1/13                                   | <i>Reseda</i><br>(1/1)             |                               |                                         |
|                | <i>Celtis</i>                      | 0/2                                   | 0/2                                    | 0/1                                    |                                    |                               |                                         |
|                | <i>Ailanthus</i>                   | 0/2                                   | 0/4                                    | 0/1                                    |                                    |                               |                                         |
| Saxifragales   | <i>Crassula</i> branch (6<br>gen.) | 0/2                                   | 0/2                                    | 0/2                                    |                                    |                               |                                         |
| Caryophyllids  | <i>Celosia</i> branch (5 gen.)     | 0/1                                   | 0/1                                    | 1/6                                    |                                    |                               |                                         |
| Asterids       | <i>Stylidium</i>                   | 0/1                                   | 0/9                                    | 0/2                                    | <i>Phlox</i><br>(2/2)              | <i>Gilia</i> (13/2)           |                                         |
|                | <i>Eremosyne</i>                   | 0/1                                   | 0/7                                    | 0/7                                    |                                    | <i>Cornus</i> (11/2)          |                                         |
|                | <i>Plantago</i>                    | 1/17                                  | 0/2                                    | 0/1                                    |                                    |                               |                                         |
| Magnoliids     |                                    |                                       |                                        |                                        |                                    | <i>Aristolochia</i><br>(47/9) |                                         |
| Monocots       | <i>Juncus</i>                      | 1/3                                   | 1/3                                    | 2/13                                   |                                    | <i>Calathea</i><br>(20/1)     |                                         |
|                | <i>Musa/Musella</i>                | 0/10                                  | 0/1                                    | 1/7                                    |                                    | <i>Globba</i> (28/1)          |                                         |
|                | <i>Allium</i>                      | 0/1                                   | 0/1                                    | 0/3                                    |                                    |                               |                                         |
|                | <i>Zostera</i>                     | 0/1                                   | 0/1                                    | 0/1                                    |                                    |                               |                                         |
| <b>total</b>   |                                    | <b>12</b>                             |                                        |                                        |                                    | <b>7</b>                      |                                         |

<sup>a</sup> taxa containing only species with a T at *matK* editing site

<sup>b</sup> numbers summarize the genera at a node that contain only species with a T at the editing site versus those genera that contain a C at the editing site. sn = sister node; an1 and an2 = ancestral nodes 1 and 2; see suppl. Fig. 1 for further explanations

<sup>c</sup> The genus *Valeriana* is the only one that combines more species with a T at *matK-2* than those with a C at a ratio of 22 to 1, which could potentially indicate a C-gain. The genus *Valeriana* is set in a background of C-containing taxa, the Campanulids. The *Valeriana* species carrying a C is *V. hardwickii*, a sister to the remainder of all other *Valeriana* species analysed here [40]. In fact, *V.*

*hardwickii* is considered to be outside of the *Valeriana* genus and thus belongs to the other C-carrying Campanulids [40]. Therefore, no T-to-C change has to be invoked for the taxon *Valeriana*.