

EVE EMSHWILLER AND JEFF J. DOYLE. 2002. Origins of domestication and polyploidy in oca (*Oxalis tuberosa*: Oxalidaceae). 2. Chloroplast-expressed glutamine synthetase data. *American Journal of Botany* 89(7): 1042-1056.

Appendix 2. Indel differences among ncpGS sequences of sampled *Oxalis* taxa: The length of each indel and whether it appears on the MPTs (most parsimonious trees) as an insertion (+) or deletion (-) is indicated (because the trees are rooted with *O. laxa* var. *hispidissima* it is not possible to determine the polarity of indels which only appear in this species). The positions of the indels in the alignment are indicated in parentheses. In the case of indels in repeated regions, where ambiguity exists in the alignment, the alternative alignment positions are indicated in square brackets.

- a. [length uncertain] intraindividual indel within EE190, of *Oxalis* sp. aff. *melilotoides* (~107-108).
overlapping:
- b. ± 3 *O. laxa* var. *hispidissima* only (106-108).
- c. +1 homozygous in one accession of *O. spiralis*, EE249, and heterozygous in one accession of *O. picchensis*, EE500 [5T=>6T, ambiguous alignment of the insertions in these two taxa, which are not necessarily at the same position, may also be 112-116. these are coded as the same character, but are apparently not homologous, see "Sequence heterozygosity" in text] (117).
- d. -12 # clones of oca 35-04: 4, 10, 14 (137-148) [deletion of unique sequence flanked by repeats, could also be at positions 133-144].
perhaps overlapping:
- e. +1 between *O. laxa* var. *hispidissima*, *O. megalorrhiza*, *O. pachyrrhiza* and all others (137) [4T=>5T, homopolymer run, so it could also be at positions 133 to 136]
- f. +6 autapomorphic duplication in *O. nubigena* (234-239).
- g. ± 2 *O. laxa* var. *hispidissima* only (243-244) [ATAT <==> AT, could as well be at 241-242].
- h. -31 synapomorphy of the $x = 8$ group (269-299).
overlapping:
- i. ± 36 *O. laxa* var. *hispidissima* only (276-311).
overlapping:
- j. -1 *O. megalorrhiza* and *O. pachyrrhiza* (307) [2G=>1G, could also be at 306].
- k. +20 autapomorphic duplication in *O. nubigena* (314-333) [could also be inserted between 261 and 262].
- l. +1 only in *O. andina* and (putative contaminant) oca MHG884 clone 25 (337).
- m. -7 between *O. laxa* var. *hispidissima*, *O. megalorrhiza*, *O. pachyrrhiza* and all others (341-347).
- n. +7 class "D" clones of cultivated oca (8 clones from all 3 plants) and Bolivian wild tuber-bearing EE259 clone 7 (359-365).
- o. ± 1 *O. laxa* var. *hispidissima* only (369).

- p. -20 Bolivian wild tuber-bearing EE259 clones 1, 2, 3, 8, 9, 10, 11 (379-398) [deletion of unique sequence flanked by repeats, could also be positions 373-392].
overlapping:
- q. [length uncertain] intraindividual indel within *O. ortgiesii* (~381-388).
- r. ± 1 *O. laxa* var. *hispidissima* only (482).
- s. -1 informative character within *O. peduncularis* clade, including class "C" clones of all 3 oca plants, with *O. picchensis*, *O. peduncularis*, *O. tabaconasensis*, *O. ptychoclada* and others; heterozygous within EE511, EE512 (505) [3G=>2G, could also be at position 503 or 504].
- t. ± 1 *O. laxa* var. *hispidissima* only (579).
- u. -6 intraindividual deletion in three heterozygous *Oxalis* accessions EE511, EE512, EE960 (581-586).
- v. +1 *O. megalorrhiza* and *O. pachyrrhiza* only (608) [3A=>4A, could be at positions 606,607,609].
- w. +2 synapomorphy of $x = 8$ group (614-615) [TC=>TCTC, could be at 616-617].
- x. -2 informative character within the $x = 8$ group, including class "A" and "B" clones of all 3 oca plants and class "B" clones of Bolivian wild tuber-bearing EE259; this character supports the "*O. lotoides* group" in some trees, but see discussion of conflict between this character and transition at site 425 (620-621) [ATAT=>AT, could also be at position 618-619].
- y. ± 3 *O. laxa* var. *hispidissima* only (626-628) [GG <==> GCTGG, could also be at 625-627].
- z. [length uncertain] intraindividual indel in EE871, *O. lucumayensis* ssp. *lucumayensis* (~650).