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CULTIVATION OF EVERGREEN AZALEA CUTTINGS IN NEUTRAL-ALKALI SOLUTIONS: A WAY TO SELECT NEW ORNAMENTALS

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Evergreen azaleas (*Rhododendron* spp.) are horticulturally important ornamental plants, which usually favour acid soil conditions, performing best when the pH is between 4.5 and 6.0. Often they show strong iron-deficiency chlorosis symptoms if growth on calcareous soil. This stress is one of the most serious difficulties in their cultivation. Only *R. ripense* was previously shown to tolerate alkali substrates.

In this study we performed a screening on 10 azaleas (*R.* 'Oomurasaki', *R. scabrum*, *R. macrosepalum* var. *hanaguruma*, *R.* 'Ryukyushibori', *R.* 'Juko', *R.* 'Shinsen', *R.* 'Susogo no ito' *R.* 'Fujimanyo', *R. tosaense* and *R. indicum*), looking for genetic resources tolerant to neutral-alkaline pH. Ten cuttings *per* genotypes were placed in three different solutions: the first (standard solution) contained deionized water and 0.5 g/L of Peter's fertilizer (20:20:20) with pH 6; in the second and the third solutions, 0.10 g/L and 1.00 g/L of anhydrous $NaHCO_3$ were added at the standard solution to adjust the pH to 7.5 and 9.0.

Every 7 days we evaluated: chlorophyll content (SPAD units), number of leaves open at the base, percentage of leaf damages (0=0%, 1=< 5%, 2=5-25%, 3=25-75% and 4=>75%), height, root size, and root quality, rated with ordinal classes from 0 to 4, to describe the ascending amount of biomass produced.

After 21 days, a statistical effect of pH on cutting development was highlighted. Solutions with pH 7.5 and 9.0 induced the highest decrease of chlorophyll content. However, among genotypes, *R. scabrum*, *R.* 'Juko', and *R. macrosepalum* var. *hanaguruma* showed a low loss (-1.26, -2.03 and -4.06 SPAD units, respectively). Similar results were obtained for ornamental characteristics. Neutral-alkali solutions negatively affected azalea quality but again, among genotypes, *R. macrosepalum* var. *hanaguruma* and *R. scabrum* presented the lowest leaf damages (0.33 and 0.61, respectively) and the highest root production (3.00 cm and 1.41 cm, respectively). Therefore, these two species showed a potential neutral-alkali tolerance. By contrast, at the same time point, *R.* 'Shinsen' and *R. indicum* cuttings showed a percentage of leaf damages over 75% (3.33 and 3.46, respectively), presenting chlorosis, leaf abscission, and roots browning.

In conclusion, the present work confirmed a significant effect of pH on azalea quality and development. Among the 10 tested genotypes, *R. scabrum* and *R. macrosepalum* var. *hanaguruma* revealed a particular tolerance to neutral-alkali pH. These species are taxonomically grouped in the Subsection *Macrosepala* together with *R. ripense*, whose tolerance to neutral-alkaline pH was already known. To better understand the molecular bases of this stress tolerance, molecular analyses by means of STMS markers are in progress.