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Wolffia arrhiza: A Cryptic Species Complex within the Genus Wolffia

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Harnessing plant diversity is essential for modern agriculture. Duckweeds have attracted increasing attention as novel crops with applications ranging from food and feed production to molecular farming. Species complexes, which may involve hybridization and polyploidization events, represent an important source of hidden genetic diversity that can be utilized for crop improvement. Recently, species complexes have been described in the duckweed genus *Lemna* (Stepanenko et al., 2026; Morello et al., 2026), suggesting that a similar pattern may also exist within the genus *Wolffia*. However, evolutionary relationships and species boundaries in *Wolffia* remain poorly understood due to the high morphological similarity among its species. In this study, we used an integrated cytogenetic and molecular approach to investigate the diversity of *Wolffia arrhiza*. By combining flow cytometry, chromosome analysis, genomic *in situ* hybridization (GISH), morphological traits, chloroplast and nuclear DNA markers, we identified distinct diploid genetic lineages as well as reciprocal triploid hybrids between them. Our findings reveal unexpectedly high diversity within *Wolffia arrhiza*, supporting its recognition as a species complex and highlighting the need for particular attention when describing and identifying accessions within this group.

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References

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