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Genome decoding of *Pistia stratiotes* (Water lettuce) and comparative genomics analysis to uncover water purification mechanisms

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Pistia stratiotes, commonly known as water lettuce, is an aquatic plant that belongs to the Araceae family and is mainly composed of leaves and roots. It reproduces asexually, mainly through stolons, although it can also produce flowers. Because of this, it is notorious as a perennial weed in tropical and subtropical regions where it forms dense mats that create dark and anoxic environments under the water surface, making it difficult for other plants and animals to survive. However, it behaves as an annual plant in regions with winters, and is considered beneficial due to its effectiveness in absorbing heavy metals and improving water quality.

This study aims to sequence the chromosome-level genome of *Pistia stratiotes* to uncover the genetic mechanisms underlying its rapid asexual reproduction and water purification capabilities. By comparing its genome to those of other aquatic plants from different families and both terrestrial and aquatic plants within the Araceae family, we seek to identify specific genetic traits and pathways that contribute to its unique characteristics. This research not only fills a significant gap in the genomic resources for aquatic plants but also offers potential applications in environmental management and biotechnological innovations.