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ORIGINAL PAPER

A Deep Hidden Diversity of Dictyostelia**Running title:** Deep Hidden Diversity of DictyosteliaSandra L. Baldauf¹, Maria Romeralo, Omar Fiz-Palacios, and Nahid HeidariDepartment of Systematic Biology, Evolutionary Biology Centre, Norbyvägen 18D,
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Dictyostelia is a monophyletic group of transiently multicellular (sorocarpic) amoebae, whose study is currently limited to laboratory culture. This tends to favour faster growing species with robust sorocarps, while species with smaller more delicate sorocarps constitute most of the group's taxonomic breadth. The number of known species is also small (~150) given Dictyostelia's molecular depth and apparent antiquity (>600 myr). Nonetheless, dictyostelid sequences are rarely recovered in culture independent sampling (ciPCR) surveys. We developed ciPCR primers to specifically target dictyostelid small subunit (SSU or 18S) rDNA and tested them on total DNAs extracted from a wide range of soils from five continents. The resulting clone libraries show mostly dictyostelid sequences (~90%), and phylogenetic analyses of these sequences indicate novel lineages in all four dictyostelid families and most genera. This is especially true for the species-rich *Heterostelium* and Dictyosteliaceae and but also the less species-rich Raperosteliaceae. However, the most novel deep branches are found in two very species-poor taxa, including the deepest branch yet seen in the highly divergent Cavenderiaceae. These results confirm a deep hidden diversity of Dictyostelia, potentially including novel morphologies and developmental

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