

Atypical structure and subunit composition of respiratory complexes in *Euglena gracilis*

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Euglena gracilis, a non-parasitic secondary green alga related to trypanosomes, has a complex mitochondrial oxidative phosphorylation system constituted by atypical respiratory enzymes (complexes I - V). Recently, the analysis of the subunit composition of respiratory complexes by 2D BN/SDS PAGE has shown that at least 41 of the non-canonical subunits reported in trypanosomes are also present in this alga along with 48 classical subunits described in other eukaryotes including green plants. In the present study the complexes I, III, IV and V were further purified from isolated mitochondria using liquid chromatography after solubilization with n-dodecyl-maltoside. Using a 3D BN/SDS/SDS PAGE analysis, we resolved their subunit composition and confirmed the atypical subunit composition of *Euglena* respiratory complexes. The apparent molecular mass of purified complexes I and V (1.6 and 2.2 MDa, respectively) is far above the classical ones. Single-particle analysis from transmission electron microscopy revealed some unusual features for complex V, including smaller angles between monomers and additional membrane extensions. Complex I also shows an unusual long matricial arm.