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Verification of electrical inductions of O.niloticus egg with physiological membrane pores

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The analysis of electrical inductions of O.niloticus egg's membrane is based on the transmembrane potential, induced due to applied electric field. The implication of the analytical model has been interpreted in terms of understanding the influence of egg size, pulse duration and electro-physical conditions of eggs on the E-field parameters (strength and duration) required for electroporation. Increasing electric field strengths resulted in increased values of the induced transmembrane potential reaching to the limit of critical values. For the controlled egg (no-induction), pore densities and pore sizes appearing on the shell surface were revealed and observations were carried out through SEM micrographs. The local pores were randomly distributed over the surface. They were volcano-shape pores. For the induced experiments, several deep and sharp pores and some partially open can easily be observed in the E-face following the application of pulse of 87.50 kV/m electric field strength, 50 μs pulse-duration and single-square wave pulses. Pore densities of both cases of the controlled and induced eggs were equal. In the case of five-square wave pulses, it was very interesting that the pore diameter of the induced eggs was larger than that of the control; where electroporation of Nile tilapia eggs clearly occurred. Pore densities of the both cases for the controlled and electroporated eggs had no different.

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