Comparative cytoarchitectonic study on cortex of fishes and amphibian using Golgi-Cox method

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Information on phylogeny is important for understanding ontogeny aspects, mainly in Neural System, because the neocortical organization in mammalians is dependent of tissue basis constructed from inferior vertebrates. Most data indicate that the six-layered mammalian neocortex evolved from a tri-laminar reptilian precursor. Any authors think that the presence or absence of consciousness is directly associated with presence or absence of neocortex on animals. But others authors have considering this thesis as inadequate to explain the cognitive phenomenon and also that this thesis is very match anthropomorphic. Neuroanatomical, behavioral and physiological characteristics can be used like comparative principles in relationship to humans or others well studied mammalians to understand the behavioral and emotional aspects of fish and also others species. Comprehension of fishes and amphibians cortices are important to neural basic science and serves how basis to specific future comprehension about important scientific aspects like 1) presence or absence consciousness in inferior vertebrates and consequently generate welfare to these animals; 2) junction between behavioral and physiological aspects to make understanding; 3) basis to embryonary comprehension of superior vertebrates. This work has studied the morphological aspects like general structure and cell's organization on cerebral cortical tissue of fishes using Golgi-Cox technique. These studies will supply the lacuna exist today on cortical histological structure of fishes. The morphological aspects of neural tissues of tree fishes genus (Oreochromis, Leporinus and Piaractus) and amphibians (Bufo genus), using Golgi-Cox method, were studied in this work. The animals were anesthetized by freezing and immediately sacrificed. The encephalons were removed of cranial box and immersed on Golgi-Cox's solution, cover light for three weeks. The tissues's analysis was performed on light microscope and the photomicrography was performed by Image J, program of image capture and analyse, and the neurons number was performed by area. Three layers were observed and named in fishes and amphibian cortex in accord with similarities to mammalians. The layer I is identical to others animals in morphological terms; the layer II is the granular is formed by granular neurons with much branches and generate tangential layer; the layer III is the pyramidal formed by big neurons relatively and these neurons emit one apical dendrite to layer I, accord with Marin-Padilla theory. The count of neurons is major to amphibian. To fishes, the media of count was 37.5 (±7.8) neurons by area of 610200 μm^2 and to amphibians to same area the media was 66.0 (±8.1). Conclusions: In general terms, these cortices have similar morphological aspects and the neurons number by area is major to amphibians.

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