

COMPARISON OF *IN VITRO* ANTIOXIDANT PROPERTIES OF SKIN GLAND SECRETIONS FROM SIX AMPHIBIANS LIVING ON THE TERRITORY OF UKRAINE

Kyriachenko Y.S., Halenova T.I., Raksha N.G.

Educational and Scientific Centre "Institute of Biology and Medicine"

Taras Shevchenko National University of Kyiv, Ukraine

zh01ke10@gmail.com

Amphibian skin is exposed to both endogenous and exogenous sources of oxidative stress and has developed various mechanisms to cope with increased oxidation. Amphibians have evolved two different strategies to reduce reactive oxygen species generation: gene-encoded enzymes and non-gene-encoded low molecular weight antioxidants. The second group includes low molecular weight peptides. It is rational to hypothesize that amphibian skin peptides with a free radical scavenging activity could be a promising source for the development of medications for antioxidant therapy.

The aim of this study was to evaluate the *in vitro* antioxidant potential of the skin secretions of six the most common amphibian species living on the territory of Ukraine such as *Bombina bombina*, *Bombina variegata*, *Bufo viridis*, *Rana temporaria*, *Pelophylax ridibundus*, and *Pelobates fuscus*.

Skin secretions were collected by washing the dorsal region of each amphibian with ultra-pure water after mechanical stimulation of their skin. The collected solutions were quickly centrifuged, and the supernatants were lyophilized. Lyophilized skin secretion samples (20 mg) were dissolved in 1 mL of 0.05 M Tris-HCl buffer, pH 7.4. The different antioxidant assays, including DPPH free radical scavenging, nitric oxide scavenging, hydrogen peroxide scavenging and reducing power, were studied. Moreover, low-molecular-weight peptides were isolated from the general skin secretion of *B. variegata* and used for antioxidant activity measurements.

All the studied skin glands secretions revealed competent antioxidant activities compared to the standard compound (25 mM ascorbic acid) *in vitro*. Skin secretions of all six amphibian species showed strong hydrogen peroxide free radicals scavenging abilities. Furthermore, all studied skin secretions had a markable reducing power. Crude skin secretions of *B. variegata*, *R. temporaria*, and *P. ridibundus* showed effective DPPH radical scavenging activity – 39%, 57% and 49%, respectively, vs 25% for 0.025 M ascorbic acid. The scavenging of nitric oxide by the skin secretions was not so remarkable –20-30% were shown only for *B. bombina*, *R. temporaria*, *P. ridibundus* and *P. fuscus*. Low molecular weight peptides (≤ 5 kDa) that were isolated from the general skin secretion of *B. variegata* showed almost the same DPPH free radical scavenging effect as compared to the standard antioxidant – 20% vs 25% for 0.025 M ascorbic acid.

The current work reveals that amphibian skin secretions might be a new source of antioxidants – low molecular weight peptides with medical-pharmaceutical significance.