

The assessment of vitamins and cholesterol amounts in gill and muscle tissues of *Clarias Gariepinus* using HPLC

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This study aims to assess the change of the levels of cholesterol and vitamin (A, D, E, K) after inhaling atmospheric oxygen in tissues like gill and muscle of *Clarias gariepinus* (Burchell, 1822) which has an auxiliary respiratory system annexed to air sac, pharynx and gill sac. Authorization for the experiments was given by Ahi Evran University's Committee for Ethical Treatment of Animals on 04.07.2011 with protocol number 2011/02. The animals were picked from Ceyhan River (Turkey) basin and divided into two groups: The ones kept in natural habitat as a control group (six animals in total) and the ones made live in atmospheric environment for 12 hours (six animals in total). After experimental application, tissues were extracted for High Performance Liquid Chromatography (HPLC) analysis. For measuring the vitamin and the cholesterol levels, autosampler HPLC machine was used. After HPLC measurement, while vitamin K1, K2, D2, D3, α -tokoferol, retinol, stigmasterol and cholesterol amounts ($\mu\text{g/g}$) in the muscle tissues of atmospheric groups were calculated as a high levels, ergosterol values ($\mu\text{g/g}$) in the same groups were calculated as a lower compared with controls. Besides, while vitamin K1, K2, D2, retinol and stigmasterol amounts ($\mu\text{g/g}$) in the gill tissues of atmospheric groups were calculated as a high levels, α -tokoferol and ergosterol values ($\mu\text{g/g}$) in the same groups were calculated as a lower compared with controls ($P < 0.05$). As a result, cholesterol and vitamin amounts in the gill and muscle tissues of fishes which lived in the atmospheric environment were calculated as different compared with control groups.

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Development of the impact resistance for the composite limb protectors via three point bending test of lamb metacarpus

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In the development of equipment in sports or in security, new methods have to be applied for the daily activities. Initially ergonomic and biomechanics tests under *in vitro* conditions can be performed, before *in vivo* tests and clinical research. These tests can be applied to muscles, tissues or bones etc. Several recent developments, including the mechanical tests of fresh whole bone specimens, offer the possibility to understand the behavior of the bones. Therefore, the aim of the present study is to determine the

effects of mechanical tests on the lamb metacarpus and impact tests of protectors to improve a durable composite protector. Easily found lamb metacarpus is used for making an analogy between the mechanical behavior of lamb and human bones. Three point bending tests are conducted using three different compression speeds to assess and compare bone's fracture properties. Determined mechanical behaviors of the bones allow that how the composite protectors withstand to the hazardous forces and effects. Computer controlled pendulum mechanism is used for the impact tests of the composite protectors. Epoxy reinforced carbon fiber and fiber glass used for the layers. For the composite layers, thickness and material type of the protectors are evaluated by the results. Finally, durable and reliable composite protector for the sports or the security is obtained for determined conditions.

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Intracellular antioxidative properties of hydrolysable tannins on animal and human small intestinal enterocyte cell model

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Ban on the use of nutritive antibiotics in Europe has narrowed the selection of feed additives, which may be used without restriction in animal nutrition. Plant extracts are frequently used alternatives to antibiotics in animal nutrition, offering high antioxidant potential, selective antimicrobial and antiviral activity. Extracts of chestnuts and oak woods are rich in hydrolysable tannins known for above described properties. To determine *in vitro* potential of hydrolysable tannins on cell activity and intracellular antioxidative potential. Hydrolysable tannins were tested for the effects on normal small intestinal porcine (PSI) and human (H4) cell lines as well as on human colon cancer derived Caco-2 cell line. Intracellular antioxidative potential was determined using DCFH-DA. Cell proliferation was followed by metabolisation of Alamar Blue. Tannins were tested in a wide range of concentrations (1000–0.05 $\mu\text{g/mL}$) and water soluble vitamin E (Trolox) was used as a control. Tannins showed highest antioxidative effectivity in concentrations between 111.1 $\mu\text{g/mL}$ and 37.6 $\mu\text{g/mL}$ without harmful effects on cell viability. Hydrolysable tannins are well tolerated by gut epithelial cells while lowering intracellular oxidative stress. *In vitro* approaches offer a valuable alternative to animal experiments for the optimal determination of additives in food and feed. However, normal cell lines are superior in terms of physiological relevance, since cancer derived cell lines have altered physiology, complicating translation of experimental data into practice.

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