IMPACT OF SOME POLLUTANTS ON THE SKIN AND COAT CHARACTERISTICS OF SHEEP RAISED IN SOME LOCATIONS AT EL-SALAM CANAL

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تأثير بعض الملوثات علي خصائص جلد وغطاء الأغنام المرباة في بعض المناطق بترعة السلام

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إلي

قسم علم الحيوان
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للحصول على
درجة دكتوراه الفلسفة في العلوم
(في علم الحيوان-هستولوجي)

مقدمة من

نجلاء سالم بدوى

بكالوريوس علوم جامعة عين شمس
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ABSTRACT

"IMPACT OF SOME POLLUTANTS ON THE SKIN AND COAT CHARACTERISTICS OF SHEEP RAISED IN SOME LOCATIONS AT EL-SALAM CANAL"

This study was carried out on thirty five adult Balady ewes that were randomly chosen from three different regions at El-Salam Canal North Sinai (10 ewes from both El Qantara Shark and Romana regions, and 15 ewes from Gelbana region) in both summer and winter seasons. Animals were kept under the prevailing environmental conditions and were usually allowed to go to pasture early in the morning and to return at sunset. On pasture, animals were fed on cultivated plants and drinking from El-Salam Canal water.

The present study was undertaken to investigate the chemical characteristics of the canal water used for irrigation, drinking and domestic purposes and to assess the levels of seven heavy metals (Cd, Cu, Fe, Mn, Mo, Pb and Zn) in such water, vegetation and blood serum to evaluate the effect of these parameters on the morphological structure, chemical composition and growth activity of different skin components of sheep raised in the three studied regions at El-Salam Canal.

Skin and fibre samples as well as water, plants and blood samples were taken twice a year, representing summer and winter seasons. The skin samples were taken from the mid-side region and the skin components were examined by histological and histochemical techniques.

The fibre samples were classified into four categories (Kemp, hetero, coarse and fine fibres).

Analysis of water samples revealed high levels of EC, TDS, Na, Mg, and Cl ions that exceed the permissible limits of **WHO (1993).**

Concerning Cd, Cu, Mn ,Mo and Zn metals, all examined water samples had lower values than the permissible limits accounted by **WHO (2004).** Meanwhile, Fe and Pb exceeded the permissible limits.

Samples also recorded lesser values than the recommended limits in irrigation water detected by **Crook (1996)** except Mo in Romana region in summer season.

Lower levels of copper metal were reported in the plant tissues of all the studied regions in winter season.

The increased salts in samples of drinking water resulted in significant decrease in the glucose level and inhibition in ALP activity in the serum of sheep but elevated total lipids. The presence of cadmium metal increased plasma glucose and decreased blood total protein and serum alkaline phosphatase enzyme, while the presence of Pb caused decreasing in blood total protein and increasing ALP enzyme. The elevated dietary copper in summer season caused significant increase in serum TL in animals at the three regions especially in Romana region.

The high level of salts in drinking water caused a decrease in all follicle dimensions. The histological measurements taken for sweat glands proved that their size increased significantly in summer than in winter.

As a result of increasing dietary concentrations of Mn in Romana and Gelbana regions, the content of carbohydrates in the two sheaths of both primary and secondary follicles recorded significant increase than in El-Qantara Shark region.

Increasing levels of dietary Zn caused high content of general protein and higher activity of ALP enzyme in the skin follicles of sheep.

Animals in Romana region which received high levels of salts in drinking water had a significant decrease in fibre diameter than those of the other two regions, while Gelbana region recorded the highest greasy fleece weight.

The percentage of coarse fibres increased in summer season, while the fine fibres showed an opposite trend. Also the coat of animals showed longest fibres in winter season compared with summer except kemp fibres.

The deficiency in copper metal caused a significant decrease in the mean number of fibre crimps/centimeter in El- Qantara Shark and Gelbana regions rather than in Romana region.

It can be concluded that the examined samples of El-Salam Canal water, plants, animals serum, skin and wool fibres from the examined areas include a variety of metal pollutants that need an urgent treatment and management.

Key words:

El-Salam Canal, water, plants, blood serum, sheep skin, wool follicles, wool fibres, sweat glands, histology, histochemistry.

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