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ACTIVITY OF DIGESTIVE ENZYMES OF THE SMALL INTESTINE OF RATS WITH DIFFERENT CONSTITUTIONAL STRESS REACTIVITY

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The aim of the work is to study the activity of membrane-bound enzymes (alanine aminopeptidase, maltase, sucrase, and glucoamylase) in different parts of the small intestine of rats with different levels of constitutional stress reactivity.

Rats were divided into three groups depending on the level of constitutional stress reactivity: 1 - high stress reactivity; 2 – average level of stress reactivity; 3 – low stress reactivity. Constitutional stress reactivity was assessed using a set of behavioral tests and analysis of histopathological differences in the tissues of the stomach, thymus and adrenal glands in some animals of each group after immobilization stress. Enzyme activity was determined in the homogenates of the mucous membrane of the small intestine.

The highest values of alanine aminopeptidase activity in all parts of the small intestine were recorded in rats with low stress reactivity compared with animals with high and low stress reactivity (differences between groups reach 38%, $P < 0.05$), and the lowest values were recorded in rats with high stress reactivity except for the ileum. It should be noted that we previously recorded an increased overall proteolytic activity of the small intestine in rats with low reactivity (Sheptytsky et al., 2019). The highest activity of maltase in the parts of the small intestine with the exception of the ileum was observed in rats with an average level of stress reactivity compared to animals with high and low levels of stress reactivity, while in animals with high and low stress reactivity the values of maltase activity are similar. In the ileum the highest maltase activity was recorded in rats with high stress reactivity. The highest sucrase activity in the duodenum and proximal jejunum is observed in rats with an average level of stress reactivity compared with animals with low and, especially, high levels of stress reactivity (differences between groups reach 62%, $P < 0.05$), in the distal part of the jejunum and ileum there was a tendency to an increase in sucrase activity in rats with high stress reactivity compared to animals with high and, especially, low stress reactivity. The highest activity of glucoamylase is observed in rats with high stress reactivity in the parts of the small intestine, with the exception of the proximal part of the jejunum, where glucoamylase activity is highest in rats with medium stress reactivity, and its minimum values are observed in animals with low stress reactivity.

Thus, the results obtained demonstrate the existence of a relationship between the genetically determined stress reactivity of the organism and the digestive function of the small intestine.

Keywords: membrane-bound enzymes, constitutional stress reactivity, small intestine.