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Saliva as an indicator of mental and physical stress

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The aim of the research was to evaluate the possibilities of using saliva as an indicator of mental and physical stress in the bioluminescent method.

Material and methods. The object of the study was the saliva of schoolchildren (15-16 years old, n=15), students (19-20 years old, Krasnoyarsk State Medical University and Surgut State University, n=227) and athletes (19-20 years old, n=25). Saliva sampling was performed before and after muscle tension and psycho-emotional stress.

The bacterial bioenzyme system NADH:FMN-oxidoreductase + luciferase was used as a test system. The residual glow intensity was used as an integral indicator of body fatigue [1, 2].

Results. It shows the greatest fatigue of schoolchildren after mental stress and the least fatigue after physical exertion. Boys got tired after physical exertion, girls after mental exertion. Physical activity tired the excellent schoolchildren. Mental stress caused fatigue of the good schoolchildren.

The fatigue of students during the study session was revealed, regardless of the region of residence and the component composition of saliva. Students had the same index of stress resistance regardless of the state of rest or mental stress. Indicators of situational and personal anxiety were higher among students from the northern regions.

For the first time, the least fatigue of highly qualified athletes was shown during high-intensity physical activity, which distinguishes them from low-skilled athletes. The concentration of lactate in the saliva of athletes increased with fatigue.

Conclusion. Mental and physical overload affect schoolchildren regardless of their academic performance and length of study. Psychological or emotional stress causes fatigue of the students' body, regardless of the component composition of their saliva and the region of residence. Physical (muscular) tension of varying intensity tires the body of highly qualified athletes to a lesser extent, which makes it possible to reveal their high stress resistance to overloads. Thus, saliva can serve as an indicator of mental and physical stress in the bioluminescent method.

It is planned to develop new express methods for pre-trip inspections of railway employees.

Key words: young people, saliva, NADH-oxidoreductase, luciferase, bacterial bioluminescence.

Conflict of interest. The authors declare the absence of obvious and potential conflicts of interest associated with the publication of this article.

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