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Effects of Tribulus terrestris saponins on exercise performance in overtraining rats and the underlying mechanisms.

Yin L[1], Wang Q[1], Wang X[1], Song LN[2].

Author information

1 a Department of Kinesiology, Shanghai University of Sport, Shanghai 200438, China.
2 b Herbert Irving Comprehensive Cancer Center, Columbia University Medical Center, New York, NY 10032, USA.

Abstract

The objective of this study was to determine the effects of Tribulus terrestris L. (TT) saponins on exercise performance and the underlying mechanisms. A rat overtraining model was established and animals were treated with TT extracts (120 mg/kg body mass) 30 min before each training session. Serum levels of testosterone and corticosterone and levels of androgen receptor (AR) and insulin growth factor-1 receptor (IGF-1R) in the liver, gastrocnemius, and soleus were determined by ELISA and Western blot. Treatment of rats with TT saponins significantly improved the performance of the overtraining rats, reflected by the extension of time to exhaustion, with a concomitant increase in body mass, relative mass, and protein levels of gastrocnemius. Overtraining alone induced a significant decrease in the serum level of testosterone. In contrast, treatment with TT saponins dramatically increased the serum level of testosterone in overtraining rats to about 150% of control and 216% of overtraining groups, respectively. In addition, TT saponins resulted in a further significant increase in AR in gastrocnemius and significantly suppressed the overtraining-induced increase in IGF-1R in the liver. These results indicated that TT saponins increased performance, body mass, and gastrocnemius mass of rats undergoing overtraining, which might be attributed to the changes in androgen-AR axis and IGF-1R signaling.

KEYWORDS: AR; IGF-1R; Tribulus terrestris saponins; overtraining; rat; saponines Tribulus terrestris; surentraînement physique; temps écoulé avant l'épuisement; testosterone; time to exhaustion

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