Sports performance, oxidative metabolism and immune function: Effects of Phlebodium decumanum (EXPLY).

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Abstract: Cycling is a sport characterized by special energy requirements due to the high competition demands: daily, high energy expenditure stages for 1 to 3 weeks without sufficient recovery periods. Overcharge, muscle fatigue and overtraining syndrome are common among cyclists and are associated to a pattern of immune disfunction characterized by overexpression of pro-inflammatory cytokines. EXPLY-37 is a purified and standardized water-soluble fraction obtained from the leaves of Phlebodium decumanum, a fern organically cultivated and processed in the Yojoa lake pure monocultures (Honduras). Different formulations containing EXPLY-37 have shown a modulating effect on the release of TNF induced in different cell lines by various stimulii. The aim of this study was to investigate the effect of Phlebodium decumanum on cycling performance and to explore the eventual correlation with the prevention of oxidative stress and immune disfunction. 18 cyclists were submitted to intensive aerobic training. They randomly received either Phlebodium decumanum, as a nutritional supplement, or placebo for 4 weeks. Parameters related to performance, oxidative damage and immune disfunction were compared at T1 (4 week training) and T0 (basal). Overall performance was improved in the group receiving Phlebodium decumanum, as shown by the increase in maximal aerobic work (watts) (367.5±16.87 vs 340±17.48, p=0.0005) maximal respiratory quotient (1.43±0.20 vs 1.25±0.05, p=0.05) and maximal lactate concentration (mmol/L) (11.64±1.5 vs 10.15±1.68, p=0.0005). These data are analyzed in connection with those related to the enhancement of oxidative metabolism (plasma CoQ10 and a-tocopherol levels) and to the prevention of oxidative stress (mitochondrial lymphocyte DNA damage). They appear to be in close relationship with the activity of Phlebodium decumanum in the regulation of certain cytokines and their receptors involved in the inflammatory response associated to the overtraining syndrome, and support the use of EXPLY-37 formulations as nutritional supplements in the prevention of overcharge, muscle fatigue and overtraining.