


Effect of Phlebodium Decumanum on the Immune Response Induced by Training in Sedentary University StudentsJose A. Gonzalez-Jurado¹,  Francisco Pradas², Edgardo S. Molina³, Carlos de Teresa⁴[Author Information](#)[Publish Date](#)[How to Cite](#)[Email link to this article](#)**ABSTRACT**

Exercise training is considered a good model to provoke different degrees of immune dysfunction affecting physical performance and some physiological responses related to oxidative stress and low grade inflammation. Phlebodium decumanum is a polypodiaceae may induce shown immunomodulating effects, specifically directed to the release of proinflammatory cytokines by macrophages in response to various stimuli, as reported different in vitro studies. The aim of this study was to evaluate the modulating effect of phlebodium decumanum, on the immune response induced by physical exercise. Thirty-one subjects (males only) were randomly divided into two groups: Group PD (n = 18); age: 22.1 ± 1.81 , weight 74.21 ± 8.74 kg) that was treated with phlebodium decumanum; Group P (n = 13); age: 22.5 ± 1.63 , weight 78 ± 12.5 kg) that was treated with a placebo. Before and after one month training program performed by both groups (three times a week), the following performance parameters and immune response variables were measured: Dynamic Maximum Force; Interval-Training; Tennis test; pro-inflammatory (TNF, IL6) and anti-inflammatory (TNF α -Iirs, IL1-ra) cytokines levels. Data were statistically analyzed with Mann-Whitney U test and Wilcoxon paired test ($p < 0.05$). Statistically significant differences were recorded within groups before and after the training program. PD group showed a significant improvement in the performance parameters (Strength Muscle Test: dorsal: $p < 0.002$; deltoids: $p < 0.03$; and pectorals: $p < 0.07$; Interval Training: $p < 0.06$; Tennis Test: $p < 0.02$). Cytokine levels resulted in a more positive profile in the PD group rather than in the P group, in which

higher levels of IL-6 ($p < 0.02$) and a reduction of TNF-Irs ($p < 0.003$) and IL1-ra ($p < 0.03$) were recorded. In this study the use of phlebotium decumanum demonstrated beneficial effects in the modulation of the immune response during physical performance.

Key words: Physical exercise, immunomodulation, TNF α , IL6, TNF-Irs, IL1-ra

Key Points

- Practicing sport or physical activity of medium-high intensity three times a week during 4 weeks induces changes in immune response indicators levels;
- The assumption of phlebotium decumanum induced a reduction in pro-inflammatory cytokines levels and a higher concentration of anti-inflammatory cytokines.
- Anti-inflammatory cytokines have a protective and modulating effect on the immune response.

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