*TACSM Abstract*

# Synergistic Effect of Exercise and Phellodendron Amurense on Muscle Mass Preservation in a Prostate Cancer Mouse Model

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ABSTRACT

Muscle loss has detrimental effects on the body. It leads to a reduction in physical function, strength, endurance, and quality of life. In men with prostate cancer (PCa), a large percentage of men will suffer from muscle loss, a debilitating adverse effect caused by both the chronic illnesses or from the treatment of these illnesses. Studies have shown that the implementation of a routine exercise elicits muscle preservation in patients with PCa. Previously, our group has found that the natural product phellodendron amurense (PA) preserves muscle mass similar to exercise. **PURPOSE**: The purpose of this study is to test the hypothesis that combining PA and exercise will have a synergistic effect on muscle preservation and strength. **METHOD**: Twenty-four, 10-week-old transgenic adenocarcinoma of the mouse prostate (TRAMP) mice were randomized into one of four study groups: Exercise (running wheel) group, PA group, exercise plus PA, or no treatment control. PA was pelleted into the feed at a dose of 600 mg/kg and provided ad lib. Body mass was measured each week. Fore limb and all limb grip strength was measured at baseline and end of study (Columbus Instruments, Columbus, OH). Mice completed 10 repetitions on the apparatus with the first five repetitions using only the forelimbs and the last five repetitions using all four limbs. After euthanasia, the right gastrocnemius and soleus were collected, cleaned and weighted. One way and two-way analysis of variance was performed with tukey's post-hoc test. Significance was set at $p<0.05$. **RESULTS**: Analysis of body weight revealed significant differences between groups ($F(3,20) = 2.93$, $P = 0.0311$). Post hoc analysis revealed significantly lower body mass at the end of the study in the combination exercise plus PA group (25.83 ± 1.72 g) compared to the control group (28.70 ± 1.70 g; $p=0.03$). Higher soleus mass was found in the mice from the exercise only (11.6 ± 5 mg) and combination exercise plus PA (11.5 ± 3.271 mg) groups compared to the no treatment control group (10.33 ± 3.445 mg), however, these results did not reach significance. No statistical significance was found in the measurement of forelimb or all limb grip strength. **CONCLUSION**: Our initial hypothesis of synergy was not supported, however, there is preliminary evidence that exercise and PA independently reduces the loss of slow twitch skeletal muscle induced by cancer. Future research is required to validate these results.