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## LENGTH-DEPENDENT FATIGUE IN RAT PLANTAR FLEXOR MUSCLES AFTER RESISTANCE TRAINING

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For plantar flexor muscles, we examined isometric muscle fatigue at two different ankle positions in resistance trained female Sprague Dawley rats. Resistance training consisted of repeated stretch-shorten contractions (5x10 repetitions, 5 d/wk for 6 wks) of maximally active muscles produced by manual ankle rotations between about 140° and 40°. In two groups of rats, muscle fatigue was produced by 40 repeated concentric contractions over two different ranges of ankle motion [40° to 90° (long muscle lengths, n = 5) and 70° to 120° (short muscle lengths, n = 5)] by rotation at 50 os<sup>-1</sup> immediately after an isometric preload contraction (duration 1.9 s, rest period 12.5 s). After 30 min of recovery, a single contraction was performed. Isometric forces were measured either at 40° (ISO40°-rats) or 70° (ISO70°-rats). Overall, resistance training increased the isometric force per gram muscle weight by 21%. In ISO70°-rats, declines in force during fatigue were similar for training (60.7 ± 8.1%, mean ± SD) and control (67.5 ± 6.7%). However, in ISO40°-rats, less fatigue was observed after training (59.6 ± 10.9%) compared to control (78.4 ± 8.8%, P = 0.02). After recovery for 30 min, the isometric forces expressed as a percentage of initial values were similar in ISO70°-rats for training (79.5 ± 6.8%) and control (80.3 ± 4.7%) but in ISO40°-rats they were higher after training (95.4 ± 6.9%) compared to control (84.7 ± 6.2%, P = 0.03). Fatigue and recovery from fatigue were improved by resistance training (5d/wk for 6 wks) of rat plantar flexor muscles but only at relatively long muscle lengths. Supported by NIOSH R01-OH-02918

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