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Maximal Oxygen Uptake during Treadmill Running and Elliptical Crosstraining

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Purpose: The purpose of this study was to compare maximal oxygen uptake (VO_2max) values between the treadmill and elliptical crosstrainer. **Method**: Twenty recreationally active individuals (10 men and 10 women, mean age, height, weight, and body composition = 29.5±7.1 yr, 173.3±12.6 cm, 72.3±7.9 kg, and 17.3±5.0 %) completed two randomized VO_{2max} tests: treadmill and Precor elliptical crosstrainer separated by 1-3 days. Breath-by-breath data were collected using a fast response turbine flow transducer (K.L. Engineering Model S-430, Van Nuys, CA) and custom developed software with AEI oxygen and carbon dioxide electronic gas analyzers (AEI Technologies, Model S-3A and Model CD-3H, Pittsburgh, PA). All breath-by-breath data were smoothed using a 7-breath moving average and then time-averaged into 60 s sampling intervals. Criteria for attainment of VO_2max included two of the following: respiratory exchange ratio (RER) > 1.1, maximal heart rate (HR) within 15 b/min of the calculated value, or VO_2 plateau (DVO_2 < 50 mL/min with an increase in power output). Paired *t*-tests were performed to determine mean differences between VO_2max, maximal HR, maximal RER, and protocol duration. **Results**: No significant differences ($p > 0.05$) were found in VO_2max (47.9 vs47.3 ml/kg/min), maximal HR (186 vs 184 b/min), maximal RER (1.22 vs 1.25), and protocol duration (11.56 vs 12.17 min) between treadmill running and elliptical crosstraining. **Conclusion**: This study revealed that the elliptical crosstrainer produced similar maximal physiological values compared to treadmill running during VO_2max testing.

Key Words: Maximal oxygen consumption (VO_2max), maximal heart rate (MHR), exercise mode

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Isolation of the Antifouling Compound Heptadecatrienoic Acid from the Coralline Alga *Lithophyllum Yessoense* Foslie

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The crustose coralline alga *Lithophyllum yessoense*Foslie is known as a main causing seaweed of algal-whitening phenomenon in marine environment. It produces a kind of allelopathic compound against fleshy seaweed. To use the allelopathic compound as an environmentally friendly antifouling agent, we have isolated the compound from the *L. yessoense* using monospores of *Porphyra yezoensis* as a test organism. The main active compound was isolated by MeOH-H_2O (4:1) extraction, fractionating by polarity, silica gel column chromatography, Sephadex LH-20 gel filtration chromatography, and reverse-phase HPLC to give a single pure compound of 55AC8. The structure was identified by 1D and 2D of ^1H and ^{13}C NMR spectroscopy and GC-MS data. Thestructure was proposed as (5E, 8E, 11E)-heptadeca-5,8,11-trienoic acid (odd-carbon fatty acid, C17:3). Biological activities such as LC_{50} of 4.5 $\mu g\ ml^{-1}$ and IC_{50} of 2.1 $\mu g\ ml^{-1}$ have been obtained. Response of monospore growth by the compound was showed a rate-limiting inhibition.

Key words: Antifouling, natural products, *Lithophyllum yessoense,* odd-carbon fatty acid, *Porphyra yezoensis*