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Rotational kinematics of pelvis and upper trunk at butterfly stroke: Can fins affect the dynamics of the system?

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ACCEPTED MANUSCRIPT

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13 Abstract

14 The purpose of the present study was to investigate the rotational kinematics pattern of  
15 the upper trunk and the pelvis and the complexity-variability of their movement, during the  
16 sprint butterfly stroke between male and female swimmers with long fins (18-26 cm) and  
17 without fins. Two pairs of 3D accelerometers and gyroscopes were used to measure segments'  
18 flexion-extension angles. There were no gender differences apart from the record. The  
19 amplitude values at the pelvis were significantly larger when swimming without fins while at  
20 the C7 they were significantly larger when swimming with them. Autocorrelation coefficients  
21 of angles' time histories were higher when swimming with fins for both segments. The power  
22 spectrums revealed a dominant frequency representing the stroke period which grew  
23 significantly stronger for the fin condition. Correlation Dimension verified a lower  
24 dimensionality for the fin condition for the C7 segment movement pattern. Overall fin use

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