The physiological indicators of race performance in mountain bike cyclists are not well established, with few studies investigating this relationship (Impellizzeri et al., 2005a; Impellizzeri et al., 2005b). Additionally, there is limited information on the variation of exercise intensity between different races. Therefore, the aims of this study were to investigate the physiological determinants of mountain bike performance and to compare the exercise intensity within and between different racecourses during a competitive season. Methods: Twelve (10 male and 2 female) recreational mountain bikers participated in this study (age: 30.8 ± 10.2 years; mass: 74.5 ± 9.7kg; height: 176.6 ± 6.8cm; VO2max 53.0 ± 5.9 ml/kg/min). Participants completed a VO2max and lactate threshold (LT) test to determine five heart rate zones (Z1 below LT, Z2 at LT, Z3 between LT and LTURN, Z4 at LTURN, and Z5 above LTURN), which were used to quantify exercise intensity during competition. Heart rate (HR), Global Positioning System (GPS), blood lactate and fluid consumptions data were collected during four races in the Sport category of a regional XC series. Results: Race performance time is significantly correlated with: absolute power output at lactate threshold (r = -0.84, P = 0.01); absolute power output at VO2peak (r = -0.94; p = 0.005); and relative PO at LT (r = -0.87; p = 0.02). A total of 42.6 ± 2.9% of the average race time (100.5 ± 29.1 min. sec.) was spent in Z5. The time spent in each ascending HR Zone was significantly higher (P = 0.000), with the exception of between Zone 1 and 2 (P = 0.871). The percentage of the total race time spent in each zone was: 4.2 ± 3.1; 2.5 ± 1.6; 61.6 ± 2.0; 35.5 ± 3.6; and, 42.6 ± 2.9% for zones 1-5, respectively. No significant differences were found in the distribution of time spent in HR zones between the four races. The mean blood lactate concentration 3-minutes post-race was 4.5 ± 2.5 mmol/L. Average fluid consumption across all races was 600.5 ± 381.1ml. Conclusion: It is concluded that power outputs at lactate threshold and VO2max are important determinants of mountain bike performance. Additionally, mountain bike can be considered a high demand sport as most of the race (78%) is spend in HR zones above LT, and this pattern does not vary according to the race profile. References
