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INTRODUCTION

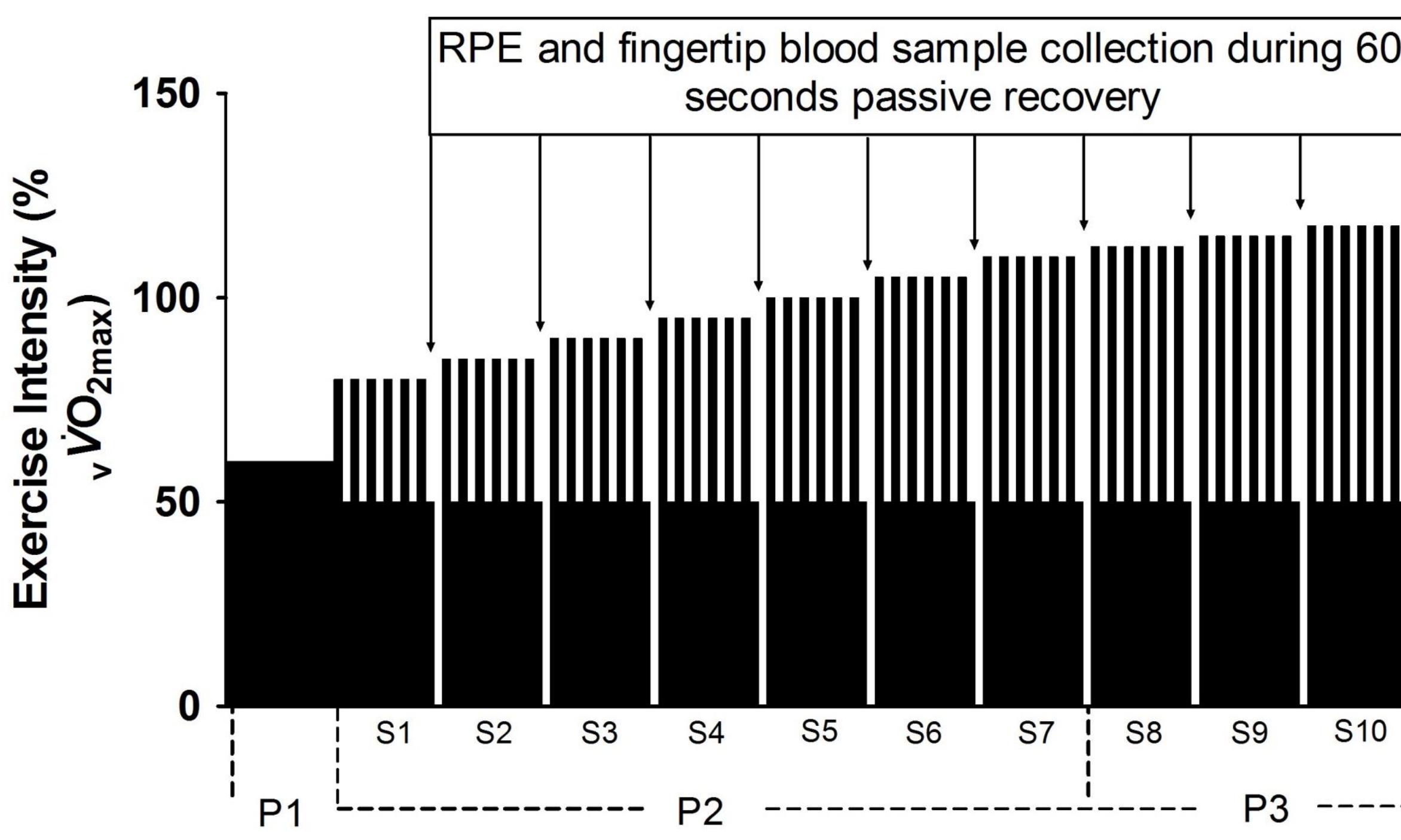
Peripheral blood flow is increased by blackcurrant intake in humans (Matsumoto et al., 2005), potentially by anthocyanin-induced vasorelaxation and vasodilation (Ziberna et al., 2013), which may affect substrate delivery, exercise performance and recovery. Blackcurrant intake improved 16.1 km cycling time trial performance, may enhance lactate tolerance, and improved post exercise lactate clearance (Willems et al., 2014).

AIMS

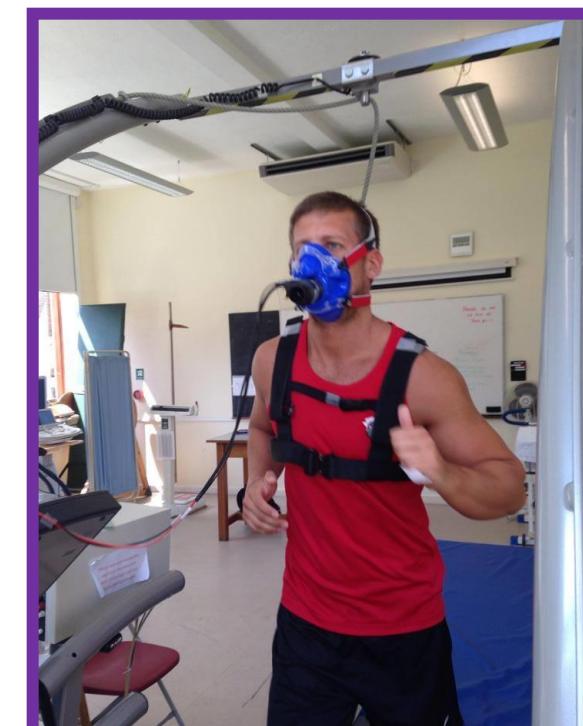
We examined the effect of 7 days New Zealand blackcurrant extract on physiological responses and performance of high-intensity, intermittent running to exhaustion.

METHODS

Thirteen physically active males (age: 25 ± 4 yrs, height: 1.82 ± 0.07 m, body mass: 81 ± 14 kg, $\dot{V}O_{2\text{max}}: 56 \pm 4 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$, $\dot{V}O_{2\text{max}}^*: 17.6 \pm 0.8 \text{ km}\cdot\text{h}^{-1}$, mean \pm SD) visited the laboratory on 3 occasions. Visit 1 - A rapid ramp test followed by a verification phase was used to confirm $\dot{V}O_{2\text{max}}$ (H/P/COSMOS, Groningen, Netherlands). Participants were then familiarised to the high-intensity, intermittent treadmill based running test (Mukherjee & Chia, 2013) which consisted of multiple phases (P) and stages (S) (see below) with continuous heart rate and oxygen uptake recording.

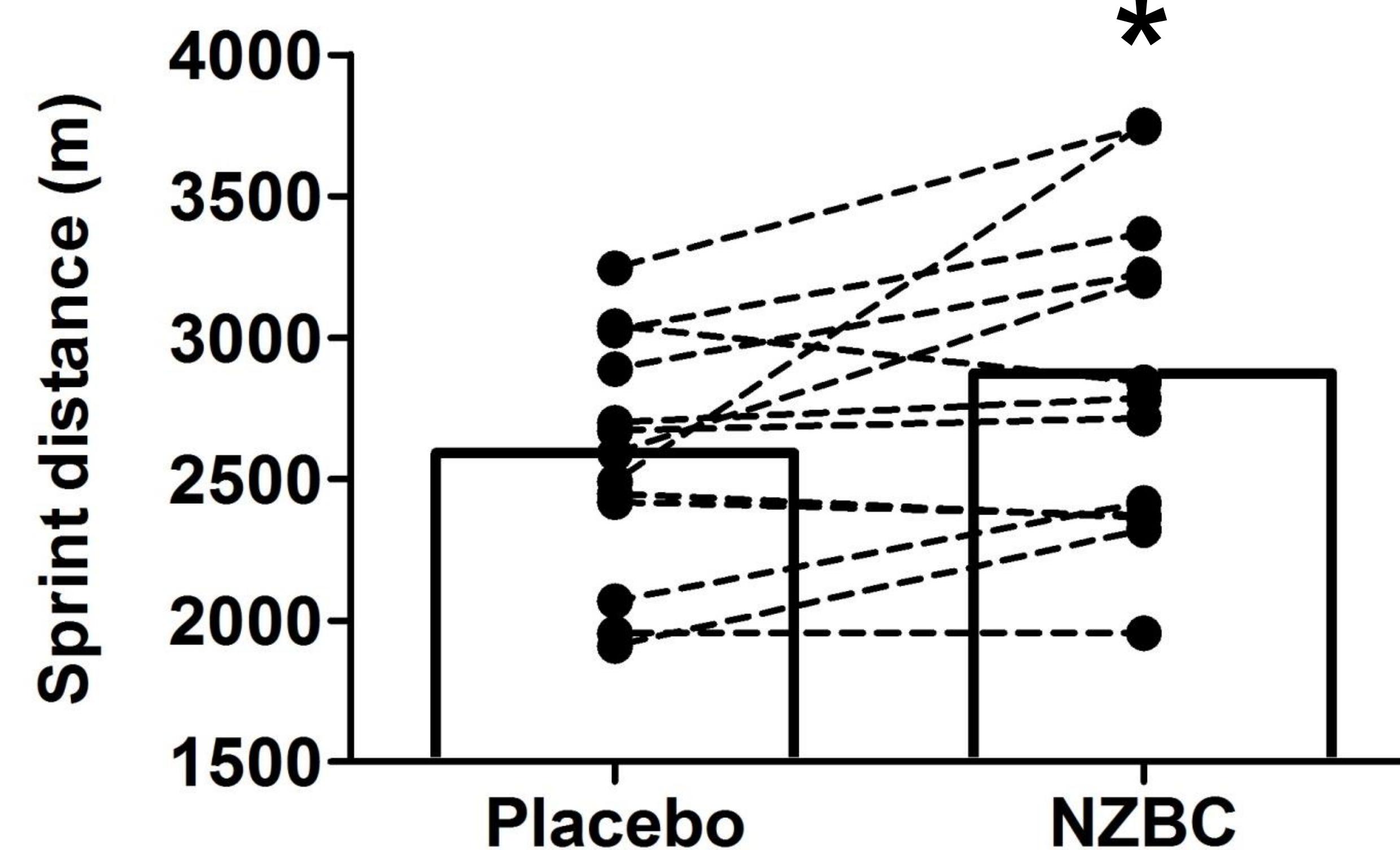


Visit 2 & 3 - Participants were tested following 7 days of New Zealand blackcurrant capsule intake (105 mg anthocyanin per dose of 300 mg CurraNZ™ 1/day) (Health Currency Ltd, UK) or placebo. Experimental design was double-blind, randomized, cross-over with a wash-out of 2 weeks. Paired t-tests were used for analysis with significance accepted at $p<0.05$ (indicated by *).

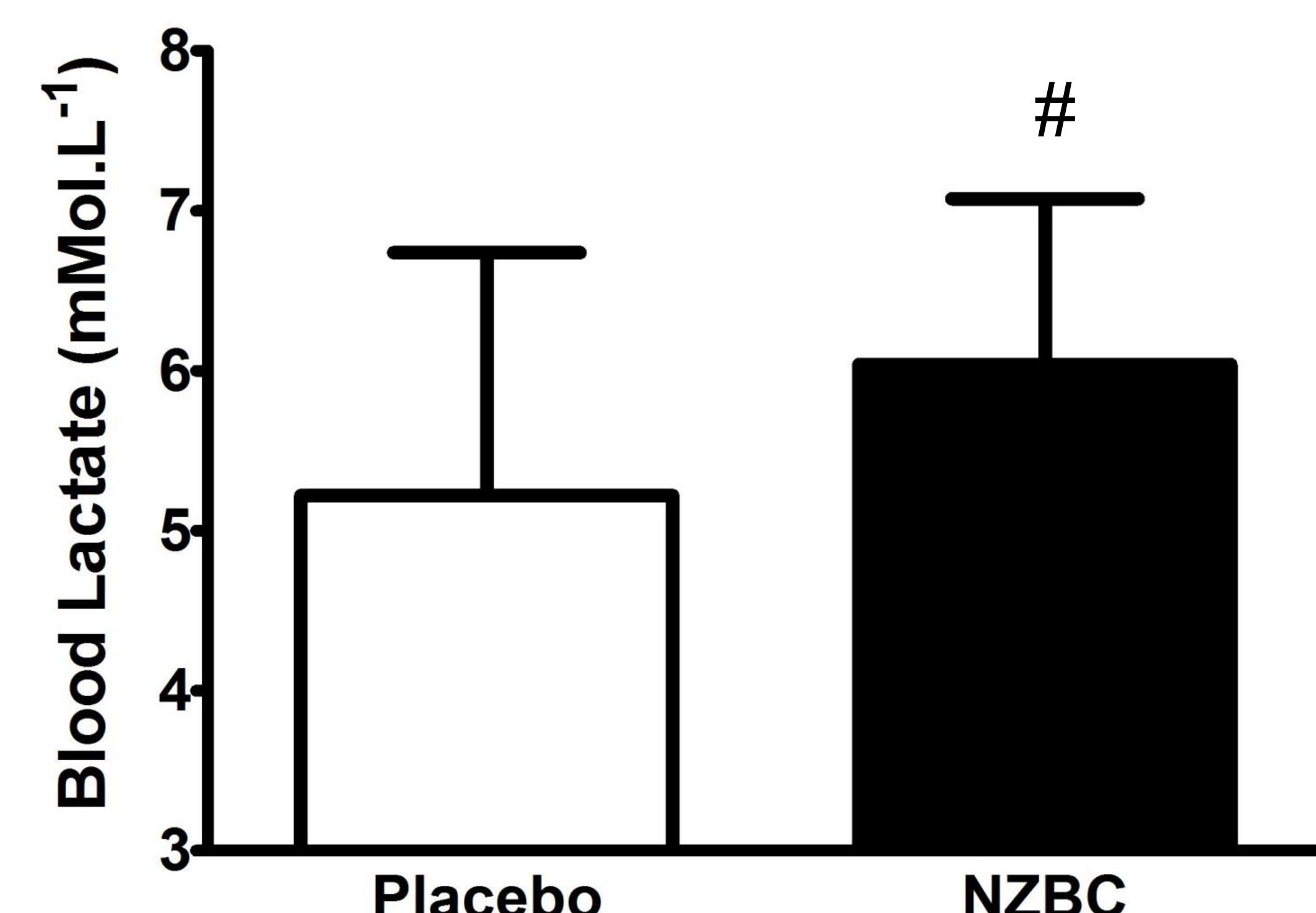


RESULTS

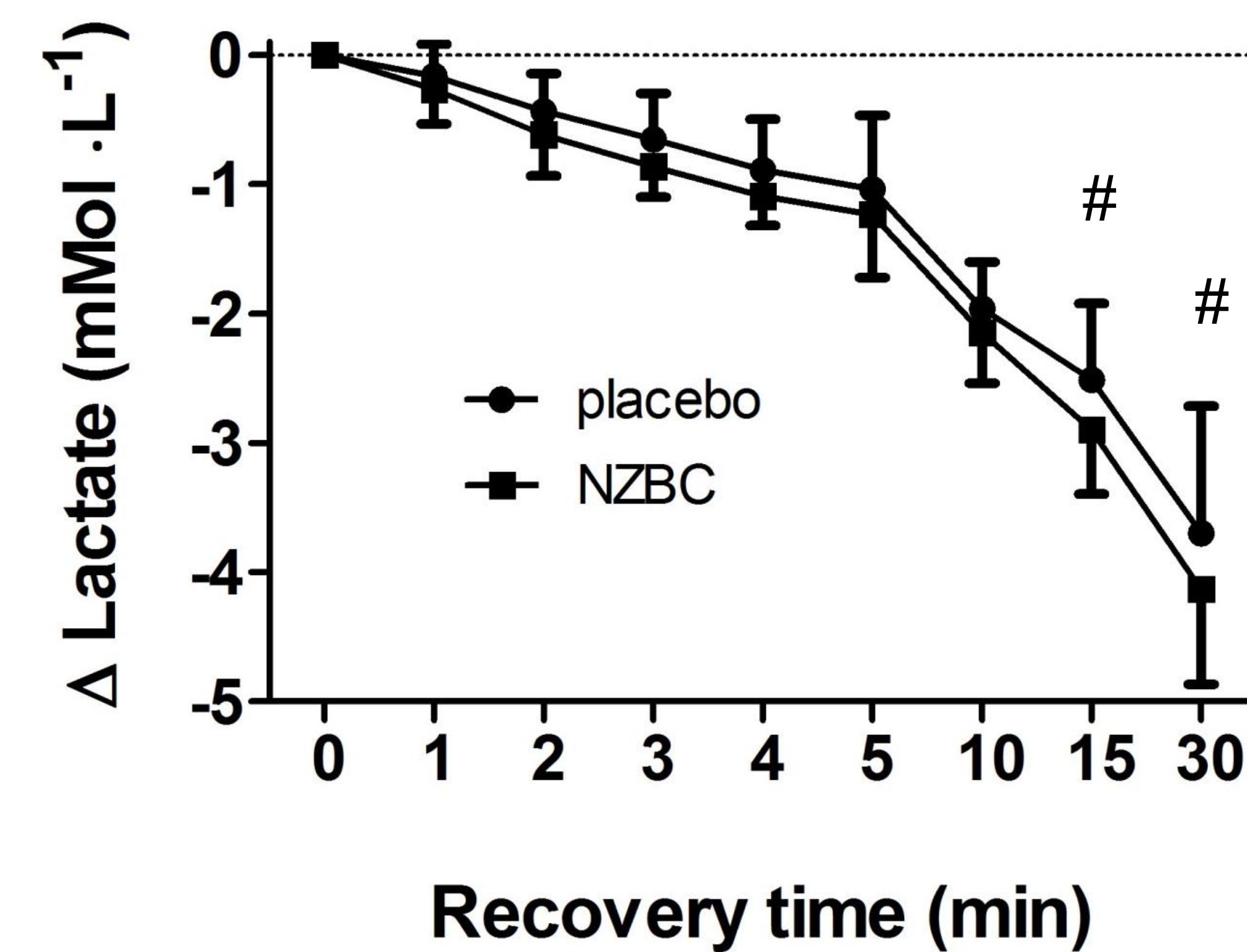
Heart rate, oxygen uptake, lactate and RPE were similar between conditions for the first 4 stages completed by all subjects. CurraNZ blackcurrant increased total running distance (i.e. distance during active recovery and sprints) by 10.6%.



CurraNZ blackcurrant extract improved distance covered during sprints by 10.8% (mean), with 1 in 3 subjects improving more than 15%.



Despite the longer running duration, there was a trend (#) towards higher lactate at exhaustion following CurraNZ intake ($P=0.07$).



There was a trend (#) towards improved lactate clearance following 15 min ($P=0.07$) and 30 minutes of passive recovery ($P=0.11$). By 30 min, lactate clearance was greater in 64% of participants.

CONCLUSION

Intake of CurraNZ blackcurrant extract is associated with 1) normal physiological responses during high-intensity, intermittent exercise, 2) improved high-intensity intermittent exercise capacity, 3) potentially higher lactate tolerance during high-intensity intermittent exercise and 4) increased lactate clearance after exercise indicating improved recovery.

APPLICATION

CurraNZ blackcurrant extract may have favourable implications for performance in sports characterised by high-intensity intermittent running, due to increased lactate tolerance, and improved recovery.

REFERENCES

- Matsumoto H et al. Effects of blackcurrant anthocyanin intake on peripheral muscle circulation during typing work in humans. *Eur J Appl Physiol* 94(1-2):36-45, 2005.
- Mukherjee & Chia. The NIE intermittent high-intensity running test: a reliable and valid test for assessment of soccer-specific fitness.. *Int J Sports Sci Coach* 8, 77-88, 2013.
- Willems et al. CurraNZ blackcurrant improves cycling performance and recovery in trained endurance athletes. In: Annual International Society of Sports Nutrition Conference and Expo, 20-21 June 2014, Clearwater Beach, FL, USA. (in press).
- Ziberna et al. The endothelial plasma membrane transporter bilirubin translocase mediates rat aortic vasodilation induced by anthocyanins. *Nutr Metab Cardiovasc Dis* 23(1):68-74, 2013.

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