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FENITROTHION AFFECTS EXERCISE ENDURANCE BUT NOT AEROBIC CAPACITY IN THE FAT-TAILED DUNNART (SMINTHOPSIS CRASSICAUDATA)

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ABSTRACT
We measured aerobic metabolism during cold exposure and exercise performance (run duration and oxygen consumption while running at 1 m sec-1) in the fat-tailed dunnart, Sminthopsis crassicaudata, a dasyurid marsupial, before and after ingestion of 30 mg kg-1 of fenitrothion, an organophosphate (OP) pesticide. Plasma cholinesterase activities returned to pre-OP ingestion levels within 5 days of dosing. Despite this, running endurance was depressed by more than 50% for up to 7 days after dosing, but metabolic rate at this running speed (ca. 9 x basal metabolic rate; BMR) and cost of transport were unaffected. Peak metabolic rate and cumulative oxygen consumption during a 1-h exposure to conditions equivalent to -20 ºC, and body temperature at the end of the 1-h period, did not change following OP ingestion, with PMR averaging 10 times BMR. We conclude that fenitrothion-induced exercise fatigue is not due to limitations in oxygen or substrate delivery to muscle or in their subsequent uptake per se, but more likely relates to decreased ability to sustain high-frequency neuromuscular function following OP intoxication. Assessing sublethal effects of fenitrothion on birds: Peak metabolism, thermoregulation and immune response. Karen Fildes, William Buttemer, Lee Astheimer, (University of Wollongong, Australia), Mike Hooper (Institute of Human and Environmental Health, Texas Tech University, USA)