

Metabolism and life-history correlates in a lowland and highland population of a terrestrial isopod

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Abstract

Ectotherms distributed along environmental gradients often show marked variation in physiological and life-history traits. Different life-history phenotypes may be correlated with variations in maintenance metabolism. We measured life-history traits and metabolic rate (VO_2) of the common wood louse (*Porcellio laevis* Latreille, 1804) from a lowland population and a highland population in northern Chile. We measured VO_2 at 5, 12, 18, and 25 °C. Wood lice from different altitudes exhibited large variations in life-history traits, which were correlated with changes in VO_2 . Fecundity of wood lice decreased and egg volume, offspring size, and reproductive output of females increased in highland populations compared with lowland populations. Isopods from the highland had a higher VO_2 than those from lowland habitats for almost all temperatures. However, when we considered VO_2 at 5 °C, VO_2 was lowest in the high-altitude isopods. In addition, since the highest thermal sensitivity values in the VO_2 –temperature curves were found at the lowest and highest temperature ranges for the highland population rather than for the lowland population, our study did not support the metabolic cold-adaptation hypothesis. We concluded that differences in VO_2 between the populations contributed to the difference in reproductive output by wood lice from cold and warm habitats.