

Metabolic Scope, Energy and Efficiency Problemsⁱ

Biology 390 -- Physiology

A short-tailed cricket, *A. arboreus*, has a metabolic rate of about $0.5 \text{ mlO}_2 \text{ g}^{-1} \text{ h}^{-1}$ at rest. Their mass is about 0.4 g. When singing they raise their rate of metabolism to about $3.6 \text{ mlO}_2 \text{ g}^{-1} \text{ h}^{-1}$.

What is the net cost of singing in $\text{mlO}_2 \text{ g}^{-1} \text{ h}^{-1}$?

What is their factorial metabolic scope when singing?

Their RQ while singing is approximately 0.85. What is their net power for singing (in mw)?

The song of the cricket described above is a loud continuous trill of approximately $48 \mu\text{w}$. How efficient (%) is this cricket at producing sound?

(this time I have given you real numbers)

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