

Preliminary results on the study of ecological energetics of the common whelk, *Buccinum undatum* L., off Douglas, Isle of Man

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The ecological energetics of the common whelk, *Buccinum undatum* L. were studied off Douglas, Isle of Man from February 1989 to August 1990. Common whelk is a predatory gastropod with a tendency for opportunistic feeding on carrion. Given its abundance and relatively large size compared to other invertebrates in the area, it probably plays an important role in the transfer of organic energy in this ecosystem.

The standard International Biological Programme (IBP) energy budget equation has been modified to include a mucus term specifically for those mucus producing animals. Food intake and oxygen consumption rates, faeces and mucus production were determined at three temperatures (representative of those found in the environment where whelks occur) for various size groups of common whelk at the laboratory. It was estimated that approximately 25 % of the total energy intake appeared as mucus production (pedal+hypobranchial). The monthly reproductive investment in energy was obtained for both males and females during a complete year. The calorific values of flesh, operculum, shell, mucus, faeces, gonads and egg capsules of *B. undatum* and flesh of lesser spotted dogfish (*Schliorhinus canicula*, which was given as food during food consumption experiment) were also determined using Phillipson microbomb calorimeter. Values of density estimates of common whelk off Douglas, Isle of Man using several methods were comparable, e.g. pot fishing (0.08-0.38 ind. m⁻²), direct census using underwater camera (0.33 ind. m⁻²) and via diving (0.17 ind. m⁻²), and marking-recapture experiments (0.49 ind. m⁻²). The effects of marking on the mortality and growth rate of *B. undatum* were assessed in the laboratory. Tagging mortality observed under poor experimental conditions was disappeared when these conditions were improved. Thus, the data from marking (and from some other methods) could be utilised to determine growth and mortality rates of *B. undatum* which will lead to the construction of an energy budget equation as a part of ecosystem modelling.

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