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A novel approach to estimate natural and fishery related mortality of the common whelk, *Buccinum undatum* (L) using shell size distributions and age readings.

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Simultaneous random beam trawl sampling of live and empty shells of the whelk *Buccinum undatum* in the Celtic and south Irish Seas revealed their similar occurrence and numbers in hauls. Therefore, we suggest that the longevity of a dead whelk shell before being either destroyed or buried in sediments is likely similar to the life expectancy of a live whelk. Because of this, the age structure of dead shells might be used to estimate recent natural mortality (M) as whelks are harvested whole and no processed shells are disposed of in fishing areas. Age structure of live molluscs reflects the total mortality (Z), and differences in age between dead and alive whelks thus mirrors fishing mortality (F). Application of age length keys based on age reading on opercular surfaces confirmed that observed length frequencies are in agreement with this hypothesis (assumed Z was higher than assumed M), and that in the Celtic Sea the natural mortality of commercial–sized whelks is ~ 0.6-0.8.

Keywords: whelk, *Buccinum*, mortality, age, Celtic Sea

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