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Rapid communication

Artificial eggs: Measuring heart rate and effects of disturbance in nesting penguins

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Abstract

A technique for the noninvasive measurement of heart rate in incubating penguins is described and evaluated. The technique uses an artificial egg fitted with an infrared sensor. Placing the egg in the nest causes minimal disturbance to the resident penguin; this penguin is then paint-marked so that subsequent measurements may be taken from the unmarked, naive partner once it assumes incubation. Heart rate changes are useful indicators of nesting penguins' reactions to events in their environment because often their behaviour does not appear to vary in response to a threat until the point at which they flee, exposing eggs and chicks to predators. The eggs can be readily transferred from one nest to another. They have been successfully deployed on both African (*Spheniscus demersus*) and Gentoo Penguins (*Pygoscelis papua*). The design should be readily adaptable for use with other seabirds and passerines.



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Keywords

Heart rate; Behaviour; Stress; Noninvasive; Disturbance; Penguin

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