

measuring research impact

Funders tend to support research that has societal relevance. But how do you measure the impact of scientific research? One way is to look at the ‘impact’ of the journals in which researchers publish. Scientific journals compete to have the highest ‘impact factor’, a measure that reports the average number of times an article is cited in other papers within a certain period. As a Centre of Excellence, the Fitz is set goals in terms of publishing papers in journals with impact factors above specific thresholds.

But impact factors are averaged across all papers published by a journal. A better measure of a given paper’s impact is the number of times it is cited – not that this is necessarily an index of importance.

The number of citations is biased by the amount of work being conducted in a given field and some papers receive lots of citations simply because they are wrong!

Despite these concerns, the number of citations remains a key tool for funders to assess research impact. However, it takes some years for citations to accumulate. In today’s fast-paced world, a potential shortcut is offered by ‘altmetrics’, a measure of the amount of attention a paper garners on internet news sites, Wikipedia, blogs and social media such as Twitter and Facebook.

Recently I co-authored two papers that have attracted considerable media buzz. The first, led by Martin Stervander and published in October 2018, reported the evolutionary history of the Inaccessible Island Rail, the smallest flightless bird in the world. Quite how a small flightless bird reached a remote oceanic island struck a chord with the popular media. The paper’s altmetric score of 244 makes it the highest ranked of 3032 papers published in *Molecular Phylogenetics and Evolution*.

And yet the paper contains no surprises; the rail’s ancestors flew to Inaccessible Island from South America some 1.5 million years ago and then lost the ability to fly. Hundreds of rail species have become flightless after reaching oceanic islands, in part because they only develop flight fairly late in their growth as chicks and thus it is easy for them to evolve into flightless



PETER RYAN

forms. The selective force driving this process is to reduce energy demand. Flightless rails need almost one third less energy to survive than do rails that can fly, because of the cost of developing and maintaining large flight muscles. Consequently they lose the ability to fly once the need to escape predators disappears.

Unfortunately, it is not easy to go back to being able to fly and so flightless rails have experienced perhaps the highest rate of extinction of any group of birds over the past few thousand years. Based on sub-fossil remains at oceanic islands, there were some 1600 species of flightless rails around the world prior to the arrival of humans and their commensals. The Inaccessible Rail survives only because its island has miraculously remained free of introduced rodents and other predatory mammals.

The other study, led by Marta Cerdà-Cuéllar and published in November 2018, provided strong evidence that humans and their commensals have been responsible for spreading disease-causing bacteria into Antarctic bird communities. This important finding has direct management implications and the paper calls for even stricter biosecurity measures for people visiting remote areas such as Antarctica. The paper has achieved an altmetric score of 137, which places it in the top one per cent of papers published in the high-ranking journal, *Science of the Total*

Brown Skuas often scavenge from humans, which can expose them to several bacterial diseases, including antibiotic-resistant strains. The skuas can then act as vectors, transmitting the bacteria to other Southern Ocean birds.

Environment. However, its score is significantly lower than the rail note.

Studies suggest that a high altmetric score is linked to more citations when papers are published in a low-impact-factor journal, presumably because of increased visibility, but has less influence on the citation rates of papers in leading journals. The bottom line seems to be that quality will out, but it doesn’t hurt to advertise. Of course, the real measure of success is research that has a tangible outcome in terms of improved knowledge, especially if this enhances our quality of life (including the quality of our environment). In this regard, I am confident that the disease paper will have a greater real-world impact than the rail note.

PETER RYAN

For more information, contact
The Director, FitzPatrick
Institute of African Ornithology,
University of Cape Town,
Rondebosch, South Africa 7701.
E-mail fitz@uct.ac.za,
tel. +27 (0)21 650 3291 or
visit www.fitzpatrick.uct.ac.za

