

COMMENT

100 articles every ecologist can actually read?¹

100 artigos que devem/podem ser lidos realmente por todos os ecólogos?

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Abstract

Reading scientific articles is fundamental for researchers, not only to keep pace with advances in their field, but also to know those giants on whose shoulders they are standing. In this sense, Courchamp and Bradshaw (2018) recently proposed a list of 100 seminal papers deemed to be of major importance in ecology, thus providing a general 'must-read' list for any new ecologist. The authors metaphorically speak of ecology as an ever-growing brick wall of published evidence. In order to quantify the degree of interference of the paywall over the wall of science, we took the opportunity given by the 100 seminal papers list and registered how many articles have been made universally and freely available by the publisher. Of the 100 scientific papers proposed as foundations of the wall of ecological knowledge, 66 are behind the paywall, with a total cost of US\$1,560. This paywall exacerbates the existing asymmetries in ecological research between researchers from developed countries and the Global South. Diversity in research, as in ecological systems, is a source of robustness. Publishing high-quality articles in regional open peer-reviewed scientific journals is a suitable way to valorize Global South ecology, helping minimize the existing asymmetries.

Keywords: ecology, information access, paywall, inequity.

Resumo

Ler artigos científicos é uma atividade fundamental para os pesquisadores, não só para acompanhar os desenvolvimentos em seu campo de ação, mas também para saber sobre os ombros de que gigantes estão de pé. Nesse sentido, Courchamp e Bradshaw (2018) propuseram recentemente uma lista de 100 artigos seminais, considerados de suma importância na ecologia, que constituem uma lista geral de artigos que os novos ecologistas "devem ler". Os autores falam metaforicamente da ecologia como uma parede de evidência publicada em constante construção. A fim de quantificar o nível de interferência da parede de pagamento no muro da ciência, aproveitamos a oportunidade dada pela lista de 100 artigos seminais e registramos quantos artigos estão disponíveis gratuitamente por meio da entidade editorial. Dos 100 artigos científicos propostos como os fundamentos do muro do conhecimento ecológico, 66 estão por trás do muro de pagamento, com um custo total de US \$ 1.560. Esse muro de pagamento exacerba as assimetrias existentes na pesquisa ecológica entre pesquisadores de países desenvolvidos e do sul global. A diversidade na pesquisa, como nos sistemas ecológicos, é uma fonte de robustez. A publicação de artigos de alta qualidade em periódicos regionais de livre acesso e revisados por pares é uma maneira viável de avaliar coletivamente a ecologia do sul global e ajudar a minimizar as assimetrias existentes.

Palavras-chave: ecologia, acesso à informação, muro de pagamento, desigualdade.

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Reading scientific articles is fundamental for scientists not only to keep pace with advances in their field of research, but also to know those giants on whose shoulders they are standing. In this sense, Courchamp and Bradshaw (2018) recently proposed a list of 100 seminal papers deemed to be of major importance in ecology, thus providing a general ‘must-read’ list for any new ecologist. The articles were proposed through the collective recommendation of several hundred experienced researchers. A lot has been written about this article in a short period of time (McPhearson *et al.*, 2018; Baum and Martin, 2018; Gilbert, 2018; Ramirez *et al.*, 2018), mostly highlighting gender bias (only seven of 100 papers included any women authors), race bias (only one of the leading authors is non-white) and an outdated focus (particularly the Anthropocene context). Some consider that the voting process may have contributed to the selection of multiple papers by prominent authors (Gilbert, 2018), highlighting almost exclusively work from male scientists and perpetuating a false perception that women, people of colour and people from the Global South are new to the field of ecology (Ramirez *et al.*, 2018).

Courchamp and Bradshaw (2018) metaphorically speak of ecology as an ever-growing brick wall of published evidence, recommending the papers that they consider to be the foundation of the wall. Thus, without reading and understanding them, the quality of the wall will inevitably decrease, losing robustness over time. However, an issue seldom brought to the spotlight is that an important fraction, if not most of the scientific literature is only accessible by subscription or pay-per-view download (Fuller *et al.*, 2014). This asymmetry of available scientific information according to purchasing power constitutes another wall of science: The knowledge paywall. Economic restrictions had led researchers to opt for strategies that allow access

to publications without having to pay for them, even in developed countries where the cost of access to scientific articles is not a major limitation (Bohannon, 2016). In order to quantify the degree of interference of the paywall over the wall of science, we took the opportunity given by the 100 seminal paper list (Courchamp and Bradshaw, 2018) and registered how many articles have been made universally and freely available by the publisher. Articles were searched on-line using non-institutional IP’s and browser incognito mode. Each article citation from Courchamp and Bradshaw (2018) was searched on Google Scholar and tracked down to the publisher’s page, where either open access or the paywall were reached. Access type and fee were recorded; all searches were independently checked and then rechecked from a foreign IP. Of the 100 scientific papers proposed as foundations of the wall of ecological knowledge, 66 are behind the paywall, with a total cost of 1180 United States Dollars (usd) if the cheapest access options were chosen (including 12 rents), and 1560 usd when the best access option were selected (Figure 1). Dissemination of peer-reviewed research ensures that we are able to build on and share existing knowledge with practitioners and policy makers. Although it is critical that the results of previous researches are available to those conducting new work (Fuller *et al.*, 2014), only 1/3 of seminal ecological publications is openly available to all researchers, and society in general. Ecosystems are a reflection of the physical environment where they developed. In turn, ecological frameworks are strongly influenced by the properties of the ecosystems in which they grow and mature (Margalef, 1968). Researchers from third world countries, raised at the most complex and pristine ecosystems on earth, are particularly hindered by the paywall system (Meneghini *et al.*, 2008). Open access to published knowledge, without the limitation of publication or access fees, may enrich all author perspectives. Groups with similar social and knowledge ties may find that they work more effectively. However, broadening a group’s knowledge is especially advantageous when complex problems must be solved (Phillips *et al.*, 2004). Keeping different social and knowledge backgrounds out of the ecological discussion will only reduce the quality of the output (Espin *et al.*, 2017). This situation is unfortunate and ironic, ecology has applied implications with an urgent deadline (Fuller *et al.*, 2014). In summary, the paywall has an elevated degree of interference of over the proposed wall of knowledge (2/3). This paywall exacerbates the existing asymmetries in ecological research between researchers from developed countries and the Global South. Diversity in research, as in ecological systems, is a source of robustness. We consider that all scientists have a degree of responsibility for this situation, publishing high quality articles in regional open peer reviewed scientific journals can be a suitable way of collectively valorise Global South ecology, and help mini-

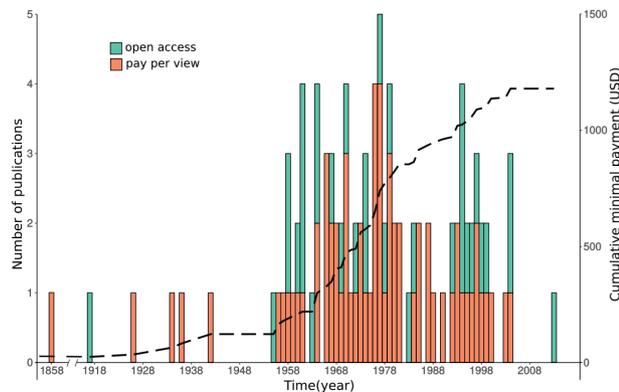


Figure 1. Results of the bibliographic search, number of publications in the original list are shown by year, with colour denoting the access category. The secondary Y axis shows the cumulative minimal payment to access articles.

mize the existing asymmetries. Instead, publishing an article behind the paywall is a way of taking a personal gain in the form of prestige, over knowledge diffusion among researchers and the general community. Maximizing the individual benefits even though society as a whole suffers is the essence of the tragedy of the commons (Hardin, 1968; 2nd article form the 100 list).

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