EDITORIAL NOTE

Development of Agrarian Sciences at the AABC with comments on impact and performance evaluations

ALEXANDER W.A. KELLNER

The Annals of the Brazilian Academy of Sciences (AABC) is a multidisciplinary journal that publishes articles in almost any scientific field. Presently there are ten major areas that follow the basic structure of how Brazilian Academy of Sciences (ABC) members are elected and enrolled in the academy: Mathematical, Physical, Chemical, Earth, Biological, Biomedical, Health, Agrarian, Engineering, and Social Sciences. No other Brazilian periodical approaches this condition, making the AABC the closest publication edited in the country to other international multidisciplinary journals, such as the Proceedings of the National Academy of Sciences (PNAS) of the United States of America, albeit not with the same impact indicators.

Along the years, there has been a steady increase in submissions in all ten major areas, but in none the rise was so remarkable as in Agrarian Sciences (AS, Fig. 1). Last year (2019) another record: 485 submitted manuscripts to AS – more than in any other area, including Biological Sciences, that traditionally has received most submissions. As pointed out before, there is a good chance that this remarkable growth – which, by the way, is very welcome – might have been influenced by *Qualisitis* (see Kellner 2017).

In order to have a general sense on how Agrarian Sciences is contributing to the overall bibliometric indicators of the AABC, I am providing a brief analysis of the sole issue published by the journal so far (AABC-90.4) containing only papers of this field (except for a letter to the editor). This was not a separate thematic publication as the AABC has done in some areas before (e.g., Cavaleiro 2018), but just a randomly formed collection of manuscripts accepted by the journal. Special volumes tend to be directed to hot-topics and can potentially introduce some bias in bibliometric indicators relative to the average contribution that a journal receives.

Using AABC-90.4 as a proxy of the performance of AS in the journal turned out to be quite interesting for a number of reasons, some of which I will not have time to explore in detail here. For example, it was discovered (by chance) that of the 64 papers published in this issue, 15 do not appear on the Web of Science (WoS) website and, therefore, were not considered in the calculation of the just released 2019 Journal Impact Factor (JIF). Perhaps this calls for the introduction of another bibliometric indicator, one that evaluates the performance of websites and organizations in registering manuscripts, the data on which the whole Impact Factor (IF) system is based. As this is not feasible at the moment and would require a large collaboration effort from several periodicals, there are ways

to establish on how the lack of registration of published articles can affect the overall performance of a journal.

One such indicator, christened here as the Missing Article Index (MAI), is defined by the number of articles published in one issue (or year) not found in WoS divided by the total number of articles published in that particular issue (or year). In the case of AABC-90.4, this involuntary omission is considerable – 23.43% (MAI= 0.2343); for the publications of the year 2018, 5.03% (MAI= 0.0503). Although it is not yet clear on how MAI has affected the 2019 IF of the journal, it influences the bibliometric indicators of authors. Together with Scientific Electronic Library Online (SciELO) we are trying to fix this situation so authors will not be harmed in their publication metrics. It should be noted that the AABC had faced this problem in the past, which was only partially solved: the papers of a missing issue (AABC-84.2) were included but the IF was not recalculated, bringing a loss to the indicators of the journal, that was not to blame for the omission (Kellner & Azevedo 2013). MAI of AABC-84.2 is 1 (the maximum and most damaging that could be achieved) and is also considerable high for the year 2012: 0.2308. In other words: almost a quarter of all articles published that year are not considered in the journal´s performance indicators, as they vanished from the JCR platform.

Still on this issue, it is important to point out that these missing articles from AABC-90.4 are recovered in Google Scholar (with citations, by the way), suggesting that this web search engine might be considered an interesting alternative to WoS, despite some known shortcomings (e.g., Durieux & Gevenois 2010). In any case, although marginal to the main purpose of the present article, it is important that the publishing (and evaluation) industry of scientific papers is made aware that the problem of missing articles quantified by MAI happens, can be significant, and should be investigated further.

Back to Agrarian Sciences, the articles published in AABC-90.4 address several topics, from the effects of artificial vocalization on the behavior of piglets (Moreira et al. 2018) and diversity of insects in olive trees (Wolff et al. 2018), to the exploration of fruits from the Atlantic forest (Souza et al. 2018). I performed a survey of the 49 papers of this issue presented by JCR-2019 to determine their contribution to the IF of the AABC.

One interesting way to start with such an analysis is to determine the number of cited articles in a particular timespan relative to the total number of articles published that are being considered (= Article Citation Factor – ACF). In 2019, the ACF of AABC-90.4 was 0.4286, indicating that less than half of the articles published in this issue (and considered by JCR-2019) were cited at least once during 2019. The IF of this particular issue is 0.5510. Of the cited papers (21), one had three citations and four were cited twice in that year. Based on the recent IF of the AABC (1.280), only about 10% of the articles published in AABC-90.4 were above that.

If only the cited articles of a particular issue (or year) in a determinate timespan are considered, one can get an indication on how a better selection of articles (by nature a difficult and controversial task) might influence the IF of a periodical for that timespan. This can be determined by dividing the total number of citations by the number of cited articles (= Reescalated Article Impact Factor – RAIF). For AABC-90.4, RAIF was 1.286. This indicates that the IF of cited articles was in accordance with the 2019-IF of the AABC.

This exercise shows that regarding Agrarian Sciences there is still some work to be done by the AABC. Based on JCR-2019, the median impact factor of journals that can be broadly classified as

representing Agrarian Sciences vary from 1.002 to 1.753. Perhaps our best proxy would be the category Agriculture – Multidisciplinary, where the top journal had an IF of 4.454. In all remaining categories related to this field presented in JCR, the journals with the highest IF (Agricultural Engineering – 7.539; Agriculture Dairy & Animal Science – 6.091; Agronomy – 5.316; Agricultural Economics & Policy – 4.189) are much higher even than the RAIF determined for AABC-90.4.

What can be done? Regardless of what one thinks about bibliometric indicators, they are here to stay (e.g., OECD & SCImago Research Group 2016) and editors must deal with them. For all in a world under the "bakery effect" (Kellner & Ponciano 2008), that invites for different kinds of comparisons (e.g., Mugnaini et al. 2008) to try to make sense of it all, even when obvious shortcomings have been pointed out early on (e.g., Porta et al. 2003).

There is no question that one of the scientific fields where Brazilian scientists do best – both in quantity and quality – is Agrarian Sciences. Even considering that the AABC makes a hard effort to attract more international contributions, the fact is that most submissions come from research groups based in the country. Having the attraction of being one of the very few open-access journals that does not charge authors for publication (a policy that might be changed in the near future), the AABC is in position to make a more careful selection of the manuscripts it decides to publish. Perhaps a subdivision of this broad area into subdisciplines (e.g., Agronomy, Animal Sciences, Soil Sciences) might encourage scientists to consider the AABC as an output of their most impactful results. The promotion of special publications on hot topics might also attract authors who work on matters that are of greater interest to this field.
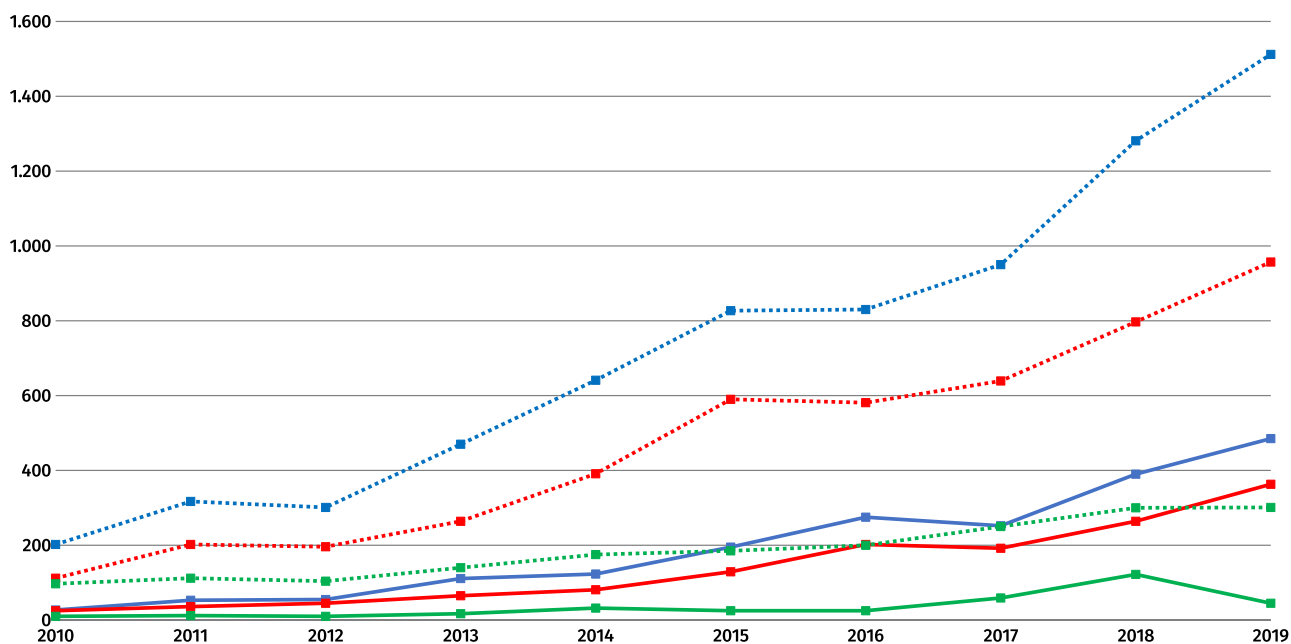

Figure 1. Graphs showing the evolution between 2010 and 2019 of the manuscripts received (in blue), rejected (in red), and published (in green) by the Annals of the Brazilian Academy of Sciences (AABC). Dotted lines represent manuscripts from all areas (including Agrarian Sciences), while solid lines represent Agrarian Sciences only.

One way or another, the potential of Agrarian Sciences to provide the main scientific periodical of the Brazilian Academy of Sciences with more impactful papers is there in quantity; now it is a question of adjustments that they also contribute to the overall performance of this journal. This present issue is the second of the AABC dedicated to this field. Perhaps it does better.

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ALEXANDER W.A. KELLNER
https://orcid.org/0000-0001-7174-9447

Laboratório de Sistemática e Tafonomia de Vertebrados Fósseis, Departamento de Geologia e Paleontologia do Museu Nacional/UFRJ, Quinta da Boa Vista, s/n, São Cristóvão, 20940-040 Rio de Janeiro, RJ, Brazil

E-mail: kellner@mn.ufrj.br