



Recent retraction cases in plant science that show why post-publication peer review is essential

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ABSTRACT

The traditional peer review in plant science publishing, independent of the level of journal or publisher, involves the examination of a submitted paper, most commonly by one to three peers, who are either selected by the authors, or by the editors. That peer review serves two functions. Firstly, it determines whether the study (methods, data, interpretation of results, conclusions) is cohesive, accurate and correctly conducted, i.e., scientifically sound. Secondly, it serves to identify problems that are peripheral to, but intimately linked with science publishing, including misconduct, data fabrication, duplication, or plagiarism. In recent years, while internet tools and stronger data-bases have allowed for the better detection of the latter two, the former two remain difficult to show. Post-publication peer review (PPPR) provides a supplementary method to traditional peer review, allowing trust in the peer community to be regained, and allowing errors that may have made it past the permeable traditional peer review, to be detected, and corrected. The burden then lies on the editors and the publishers to correct the literature. This case study highlights recent examples of retractions that have emerged that exemplify the urgent need for PPPR in plant science.

Keyword: correction, editorial responsibility, erratum, ethics, fraud, peer review

INTRODUCTION

When Dr. Hyung-In Moon, a South Korean plant organic chemist, faked email addresses in a bid to review his own studies (<http://retractionwatch.com/2012/08/30/20-more-retractions-for-scientist-who-made-up-email-addresses-so-he-could-review-his-own-papers/>), at least 31 papers were retracted. That study may well have been the alarm bell that sounded for the plant sciences. In that case, it was misconduct and abuse of the editorial system that led to the retractions. Yet, an examination of the literature reveals that retractions can also result from poor research conduct, lack of ethics such as duplication, plagiarism or data falsification. Recent retractions from the plant science literature have caused concern among plant scientists, who are now trying to understand how it is that such errors could have emerged when so much faith had been placed on the traditional peer review (TPR) system, even though there are voices in the wider science community that consider an increase in retractions to be a positive sign since they reflect greater awareness and pro-active attitudes [1]. In fact, an in-depth analysis of TPR reveals that this system is extremely porous, fallible to abuse, bias and corruption, caused in part by the failure of the publisher to secure properly qualified specialists and in part by the lack of deep commitment by peers to responsibly review the paper, thus nullify the apparent and projected image of robustness that it carries [2], requiring thus post-publication peer review (PPPR) as a supplementary tool to repair the errors that could not be detected in TPR [3,4]. One can thus confidently say that plant science publishing is in crisis since the main barometer for quality control (QC), the TPR, is thus anything but perfect. Poor science and misconduct are hypothetically under-reported in

plant science. Sting operations, such as those conducted by Bohannon [5], although themselves on shaky ethical ground, serve to show that TPR is extremely fallible and subject to abuse by the author, often unsuspected by the peer reviewers, the editor board or the editor-in-chief (EIC). The QC triage, which traditionally consists of the authors, editors and peer reviewers, and publisher [6], has thus been broken since two key elements of the publishing process, trust and honesty, are gradually being lost, and are increasingly difficult to prove.

In this short paper, I wish to bring the attention of the plant science community to eight recent (2012-2014) case studies about retractions that occurred for several reasons. PPPR may or may not have been conducted anonymously in each case, but awareness was made on blogs and through search engines of the terms “retraction” or “retracted paper”. The purpose of these case studies is to raise awareness of the urgent need for scientists, journals and their editor boards and EICs, and publishers, to conduct PPPR. Retraction notices that explain the problem in detail that appear as open access, i.e., not behind a pay-wall, and that display a watermarked RETRACTED prominently on the original PDF serve the scientific community best as they serve not only as historical documents of the problem in the literature, but also as deterrents to other scientists who might be considering the use of misconduct in science publishing. Each case tells its own story.

Case studies

Case 1 also involves a retraction that reveals the correct way

in which editors and journals should embrace PPPR. Figures in a 2005 paper [7] were duplicated in a 2006 paper [8], which incorrectly claimed that *Dendrobium fimbriatum* Hook. (2005 paper; [7]) was *Dendrobium chrysanthum* Wall. (2006 paper; [8]). The retraction notice was clear, factually correct, assigned responsibility and displayed the retraction note and the retracted paper with a watermarked PDF in open access format. The retraction by Folia Horticulturae represents a model retraction in the plant sciences.

Case 2. Mohanty and Das [9] duplicated several figures that indirectly claimed, in four separate papers, that the same figures represented three different *Dendrobium* species (*D. densiflorum* vs. *D. densiflorum* vs. *D. chrysanthum* in Mohanty *et al.* 2012, 2013a, 2013b [10, 11 and 12, respectively]). The use of duplicated figures, and the claim that the same figure represented different *Dendrobium* species resulted in this retraction. The scientific accuracy of the remaining three papers, and the integrity of their data sets, remains a question that the editors and publisher have yet to respond to.

Case 3. This case highlights misconduct that was indicated to several publishers, but has yet to be corrected in several of the related papers. Khalafalla *et al.* [13] duplicated one figure of *Moringa oleifera* in a previously published paper [14]. In addition, the data in Table 1 of the former paper was identical to the data in Table 2 of the latter paper. Similar ethical infractions by the same authors with research pertaining to cotton (*Gossypium hirsutum* L.) have not been met with equal penalties, nor have the journals issued errata, or corrigenda. The three studies in question are Abdellatef and Khalafalla (2007)[15], Abdellatef and Khalafalla (2008a)[16], and Abdellatef and Khalafalla (2008b)[17]. Specifically, Fig 1C of [16] = Fig 1A of [17], and Fig. 1D of [17] = Fig. 1F of [15], while Table 1 data of [16] is identical to Table 1 data of [15]. This case indicates that the will to correct the literature depends exclusively on the protocols in place to deal with misconduct in each journal and by each publisher and that even though a publisher is aware of the errors or misconduct, some, as in this case, are unwilling to responsibly correct the literature. Neither are the authors, who have been duly informed of the errors, willing to responsibly take the initiative of correcting the literature.

Case 4 involves three papers on *Chrysanthemum morifolium* (Naing *et al.* 2013a, 2013b, 2013c; [18, 19, and 20, respectively]). Despite several dozen errors or flaws having been reported for the [18] and [19] papers, only minor errata were published. However, a serious fraud had been committed in the [20] paper, leading to a retraction. As indicated by the EIC of the Journal of Horticultural Science & Biotechnology, Dr. T. Michael A. Wilson [20]: "It has been brought to my attention that the article "Secondary somatic embryogenesis in *Chrysanthemum morifolium* (Ramat.) cv. Borani" by Naing *et al.*, published in the Journal of Horticultural Science & Biotechnology (2013) 88, 762-767, is essentially an exact copy of a paper previously published by Naing *et al.* in Plant Cell, Tissue and Organ Culture (2013) 112, 361-368 entitled "Primary and secondary somatic embryogenesis in *Chrysanthemum* cv. Euro". Apart from the fact that two different cultivars were studied, with some slightly different results, almost all of the main texts, Tables, Figures, and References are identical. Serious scientific malpractices such as the falsification of data and blatant plagiarism are not tolerated by this, or any other reputable peer-reviewed research Journal. I must therefore retract the former article from the Journal of Horticultural Science &

Biotechnology."

Case 5 also involves chrysanthemum, *Chrysanthemum indicum*. Eeckhaut and Van Huylenbroeck [21, 22] were almost identical text, data and figures, except for a small new data set in the 2012 paper [22]. The International Society for Horticultural Science, publisher of Acta Horticulturae, correctly and promptly retracted the paper within a matter of days.

Case 6 involves *Anthurium* by Raad *et al.* [23, 24], which duplicated several figures while several identical data points were represented differently as tables and figures in both papers. The 2012b paper [24] was retracted, but no trace of the existence of that paper can be found on the publisher's web-site. This represents an irresponsible attitude by the publisher since the existence of a scientific paper cannot simply evaporate. Negligent and irresponsible behaviour by publishers that claim to be academic may be one reason why such open access publishers have been listed as "predatory" at www.scholarlyoa.com. The Raad *et al.* papers [23, 24] also are a case of "snub publishing" [25].

Case 7 is a more complex case that involves at least four papers: Kalimuthu and Prabakaran (2013a, 2013b) [26, 27], Prabakaran *et al.* (2013) [28], and Kalimuthu *et al.* (2014) [29]. The problems with the papers can be summarized into four categories, as follows:

Data duplication

data in Table 2 of [29] = data in Table 1 of [28];

data in Table 3 of [29] = data in Table 4 of [28].

Micromolar amounts are used by [28] and mg/l amounts in [29] to feign originality.

Figure duplication and manipulation

Fig. 1F of [26] = Fig. 1E of [27] = Fig. 1G of [29];

Fig. 1A of [27] = Fig. 1A of [28];

Fig. 1B of [27] = Fig. 1B of [28];

Fig. 1F of [27] = Fig. 1F of [28];

Fig. 1D of [29] = Fig. 1C of [26];

Fig. 1E of [29] = Fig. 1C of [26];

Fig. 1B of [26] = Fig. 1D of [28] (tilted and twisted).

Plagiarism:

The Kalimuthu and Prabakaran review [27] copies the abstracts of most studies in the literature it represents, and presents this as a review, listing the studies chronologically.

Salami slicing and data/method duplication

In vitro tuberization, shoot and flower induction were already reported in [26] (classical salami slice adding information to text in [26] and data in tables in [29] to feign originality with cases of self-plagiarism and exact text copied in the M&M section.

The [27] paper was consequently retracted.

Case 8 is most likely the most high level and high profile of the plant science retractions and involves two papers [30, 31], one in *Cell*, with a 2012 impact factor of 32.4, and *Nature*, with a 2012 impact factor of 38.597, which were retracted due to figure manipulation and confusions on data that were not supported by the figures. The level of profile is high because of the quality of science that is inherent in these papers, the fact that papers by this group are highly referenced in other papers related to molecular aspects of plant development, and because some of the authors involved with the official culprit of officially declared fraudulent behaviour, Pankaj Dhonukshe, are among the highest level plant scientists in the world, at least with respect to molecular aspects of root and shoot development. Despite this highest-level-of-responsibility status, these individuals have not

provided public responses to public criticisms at Retraction Watch (<http://retractionwatch.com/2014/03/21/i-am-deeply-saddened-and-disturbed-co-author-of-retracted-nature-paper-reveals-how-problems-came-to-light/>).

CONCLUSIONS

PPPR is an important way – when used anonymously or not – to raise awareness about and correct errors in the plant science literature. PPPR can achieve several functions: 1) it can detect poor or incorrectly conducted science; 2) it can identify duplicated papers, data-sets, figures or tables; 3) it can help to identify patterns of misconduct; 4) it is a post-publication process that allows for the detection of academic misconduct, data fabrication, falsification, duplication, or (self)plagiarism in the scientific literature and may thus serve as a key preventive mechanism by increasing the likelihood of detecting and penalizing misconduct, and deterring future similar misconduct. PPPR is an effective tool and needs to form a definite supplement to TPR [2] to correct the plant science literature. The process will not be easy, it will be painful, it will require a concerted effort and, more importantly, sincere desire to correct the literature. It will face hurdles, psychological and practical, and it will require the effort of all players in plant science publishing, namely the authors, reviewers, editors and publisher, to achieve a sound base for confident, trustworthy publishing in the future. A protocol for how PPPR can be conducted by members of the plant science community will be discussed in a separate paper.

Conflict of Interest Statement

The author declares that the research for this paper was conducted in the absence of any commercial, financial or other relationships that could be construed as a potential conflict of interest.

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