

*Rebuttal to: Ma et al. “Past, current, and future research on microalga-derived biodiesel: a critical review and bibliometric analysis”, vol. 25, pp. 10596–10610*

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**Environmental Science and Pollution  
Research**

ISSN 0944-1344

Volume 27

Number 7

Environ Sci Pollut Res (2020)

27:7742-7743

DOI 10.1007/s11356-020-07836-y

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## Rebuttal to: Ma et al. “Past, current, and future research on microalga-derived biodiesel: a critical review and bibliometric analysis”, vol. 25, pp. 10596–10610

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Received: 26 January 2019 / Accepted: 23 January 2020 / Published online: 1 February 2020  
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Ma et al. (2018) recently published a paper in this journal entitled “Past, current, and future research on microalga-derived biodiesel: A critical review and bibliometric analysis”. Many of the related results presented in the original paper (Ma et al. 2018) are not acceptable because of the use of inappropriate search filters (Ho 2018a). Ma et al. (2018) stated in “Materials and methods” that “In this study, the following keywords (alga\* or microalga\* or micro-alga\* or “micro alga”) and (biodiesel or bio-diesel or “bio diesel”) were used to search titles, abstracts, and keywords in the SCI-Expanded database. The search was implemented on 18th January 2017 to collect documents published between 1993 and 2016. As a consequence, 3576 publications were obtained”. In fact, a total of 3631 publications were found by the same method as mentioned in the original paper (Ma et al. 2018). There is a difference between 3576 and 3631 publications.

The SCI-EXPANDED was originally designed for researchers to find published literatures, but not intended for bibliometric study (Ho 2018a). Thus, it is necessary to employ bibliometric analysis when using the SCI-EXPANDED for bibliometric study (Ho 2018a). However, Ma et al. (2018) considered keywords in titles and abstracts, as well as keywords which included author keywords and *KeyWords Plus*. *KeyWords Plus* provides search terms extracted from the titles of papers cited in each new article listed in *Current Contents* (Garfield 1990). Those documents that can only be found in *KeyWords Plus* are more likely to be unrelated to the “microalga-derived biodiesel” (Fu and Ho 2015). In order to

have more accuracy in data analysis, Ho’s group firstly proposed the “front page” filter (Fu et al. 2012; Ho and Fu 2016)—which covers only documents with searching keywords in their “front page”, including only the title, abstract, and author keywords, and might avoid introducing unrelated publications for analysis (Fu et al. 2012; Ho 2018a). In total, 1545 searched documents (43% of 3631 documents) unrelated to “microalga-derived biodiesel” were searched out because of using the searching tool in Web of Science without any further data treatment. These include, for example, articles entitled “Forward with osmosis: Emerging applications for greater sustainability” (Hoover et al. 2011) and “Production of lipids in 10 strains of *Chlorella* and *Parachlorella*, and enhanced lipid productivity in *Chlorella vulgaris*” (Pribyl et al. 2012) as well as reviews entitled “Waste biorefinery models towards sustainable circular bioeconomy: Critical review and future perspectives” (Mohan et al. 2016) and “A review of LCA greenhouse gas emissions results for advanced biofuels: The use of meta-regression analysis” (Menten et al. 2013). None of these papers is related to “microalga-derived biodiesel”. Furthermore, similar comments have been published in *Environmental Science and Pollution Research* (Ho 2018a) and *Renewable & Sustainable Energy Reviews* (Ho 2018b).

In “Performance of institutes”, Ma et al. (2018) presented as original that “The performance of the top 15 most productive institutes was shown in Table 3”. Here these authors have copied the same table and concept from papers published by Ho’s group (Mao et al. 2010) who had already compared the six bibliometric indicators such as total articles, independent articles, collaborative articles, first author articles, corresponding author articles, and *h*-index.

In “Main research hotspots for microalga-derived lipid”, Ma et al. (2018) mentioned that “the 30 most frequently used author keywords were grouped into one 8-year period and two 3-year period during 2003–2016. Their rankings and

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percentages are shown in Table 4". It has been pointed out in comments (Ho 2016a, b; Fu and Ho 2017) that Ho's group (Zhang et al. 2010) has developed a method of combining article titles, abstract, author keywords, and *KeyWords Plus* to provide important clues for research hotspots. Furthermore, a new method, "word cluster analysis", has been successfully applied to find the research hotspots in a field (Mao et al. 2010; Wang and Ho 2016). Similar comments have also been published in *Environmental Earth Sciences* (Ho 2016a), *Scientometrics* (Ho 2016b), *Journal of Cleaner Production* (Fu and Ho 2017), and *Environmental Science and Pollution Research* (Ho 2019).

The Science Citation Index Expanded (SCI-EXPANDED) was originally designed not for bibliometric study. It is necessary to have an appropriate data analysis for bibliometric study. The inappropriate use of search analysis method can have enormous effects on the results obtained, and thus great attention should be attached to the bibliometric method chosen. Citing an original paper not only respects those authors who presented a novel idea but also directs readers to the details of the original work (Ho 2018a, b). In my view, Ma et al. should have used an appropriate bibliometric method and cited the original papers for all the indicators and concepts they discuss, thereby providing greater accuracy and detailed information about the bibliometric concepts that they employed (Ho 2018a).

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