



HEALTH TARGETS OF DIETARY MICROALGAE BIOMASS: A SYSTEMATIC REVIEW

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Introduction

Spirulina (taxonomically named as *Arthrospira*) and *Chlorella* are edible microalgae. While the cyanobacteria *Arthrospira* has been traditionally used for centuries as human food by diverse cultures, the chlorophyte *Chlorella* was introduced to the food market in the second half of the 20th century. Both of them include many bioactive molecules of enormous potential for human health in their biochemical profile.

The aim of this study was to systematically reviewing the scientific evidences about the effect of dietary *Arthrospira* and *Chlorella* consumption on different health outcomes.



Methods

A search for human studies was carried out in Pubmed and the Cochrane Library. Randomized controlled clinical trials that used Spirulina or *Chlorella* as a dietary supplement were selected according the following flowchart.

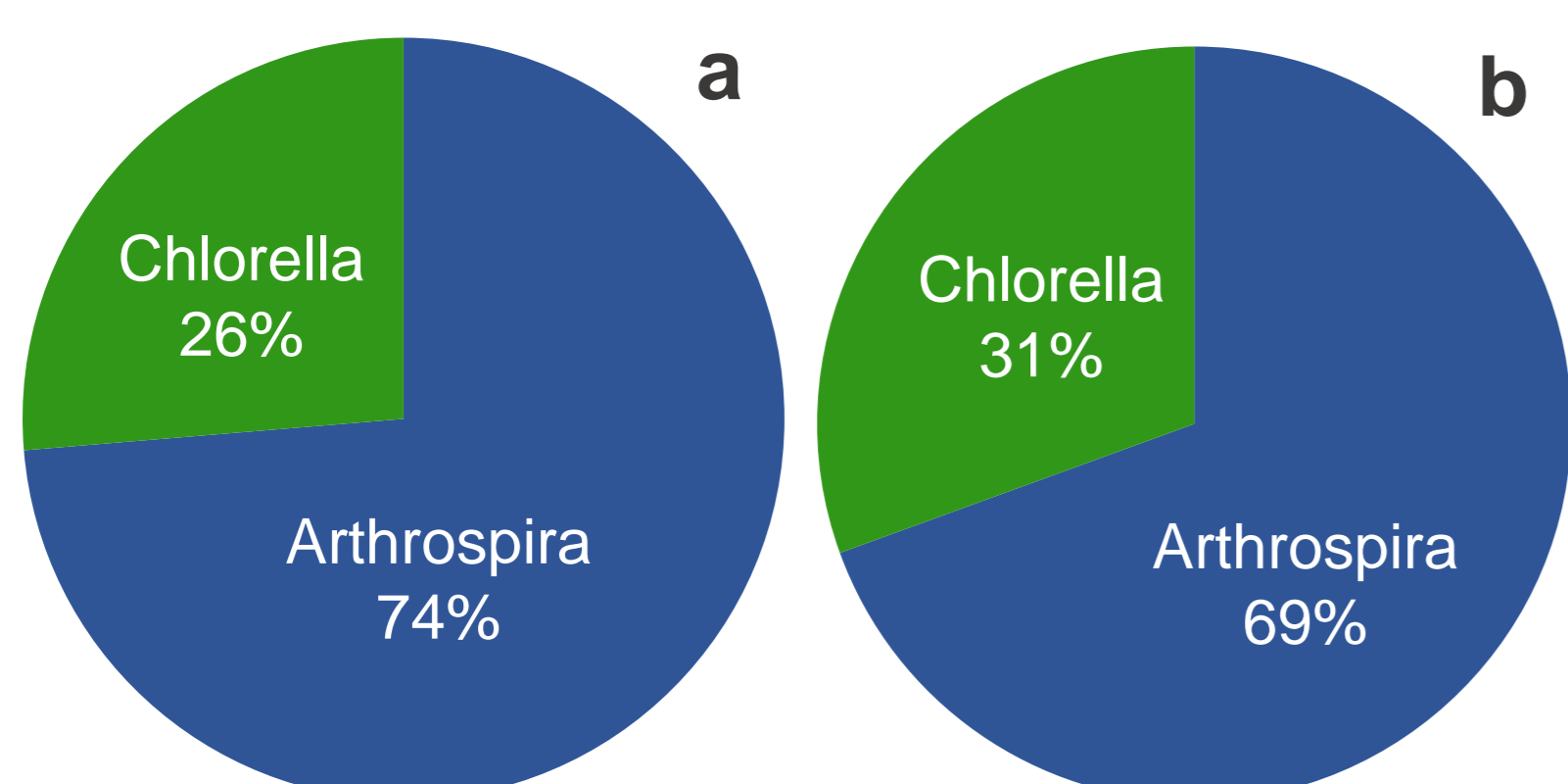
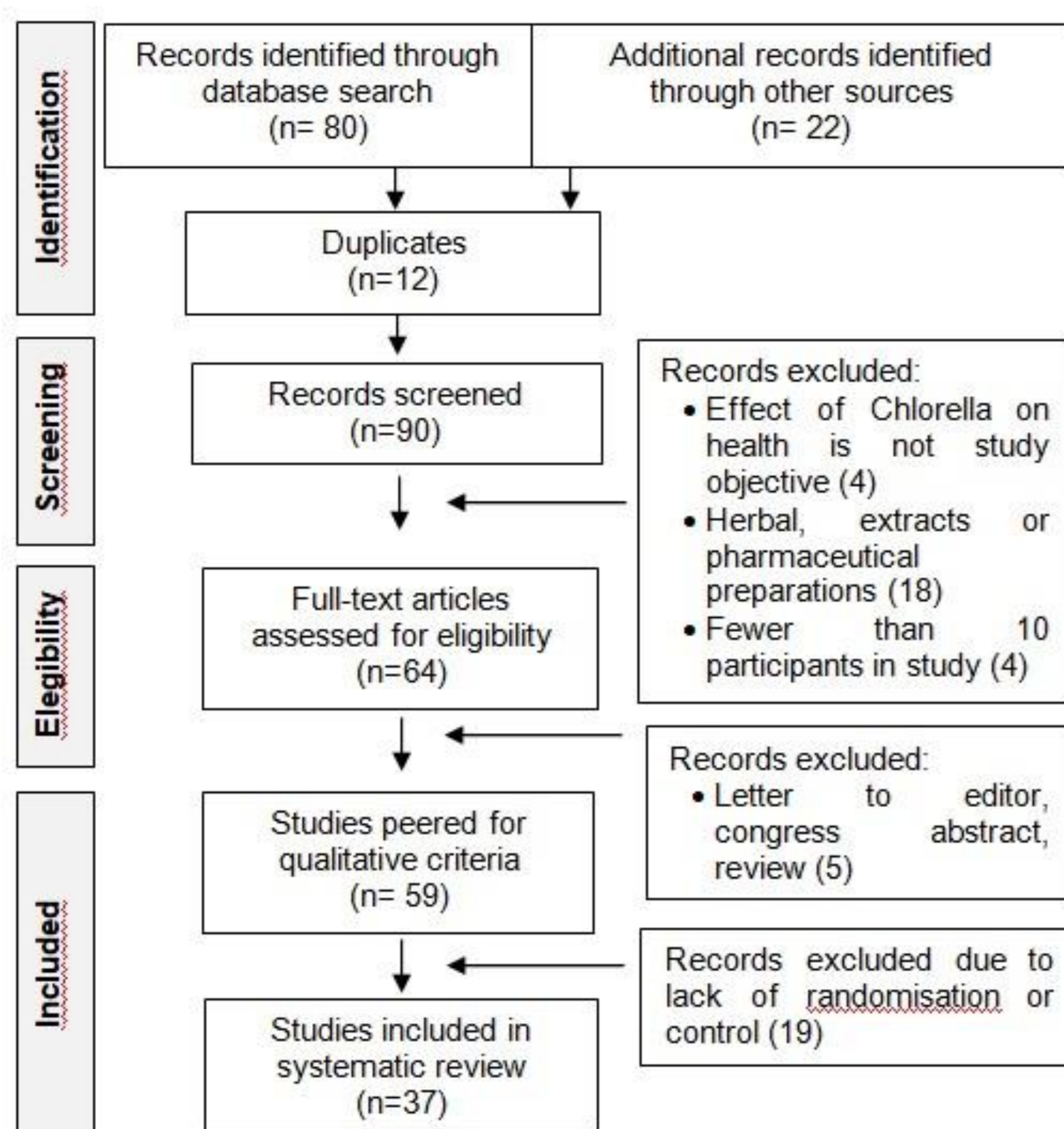


Figure 1. Percentage of studies peered for qualitative criteria (a) and studies finally included in the systematic review (b) for both genus

Results

50 randomized clinical trials were included in this analysis, 26 clinical trials using Spirulina and 11 clinical trials using *Chlorella*. Health outcomes were categorized in a main group related to the **antioxidant capacity** of microalgae which contains different subgroups: metabolic dysfunction including dyslipidaemia, diabetes, and hypertension, exercise performance, immune response and aging, inflammation and tumour development, and allergic rhinitis. The antiviral effect of both microalgae as well as their effect on nutritional status were also included in the study.

Most of the health outcomes targeted in the selected clinical trials improved after daily consumption of both microalgae. No adverse effects were recorded.

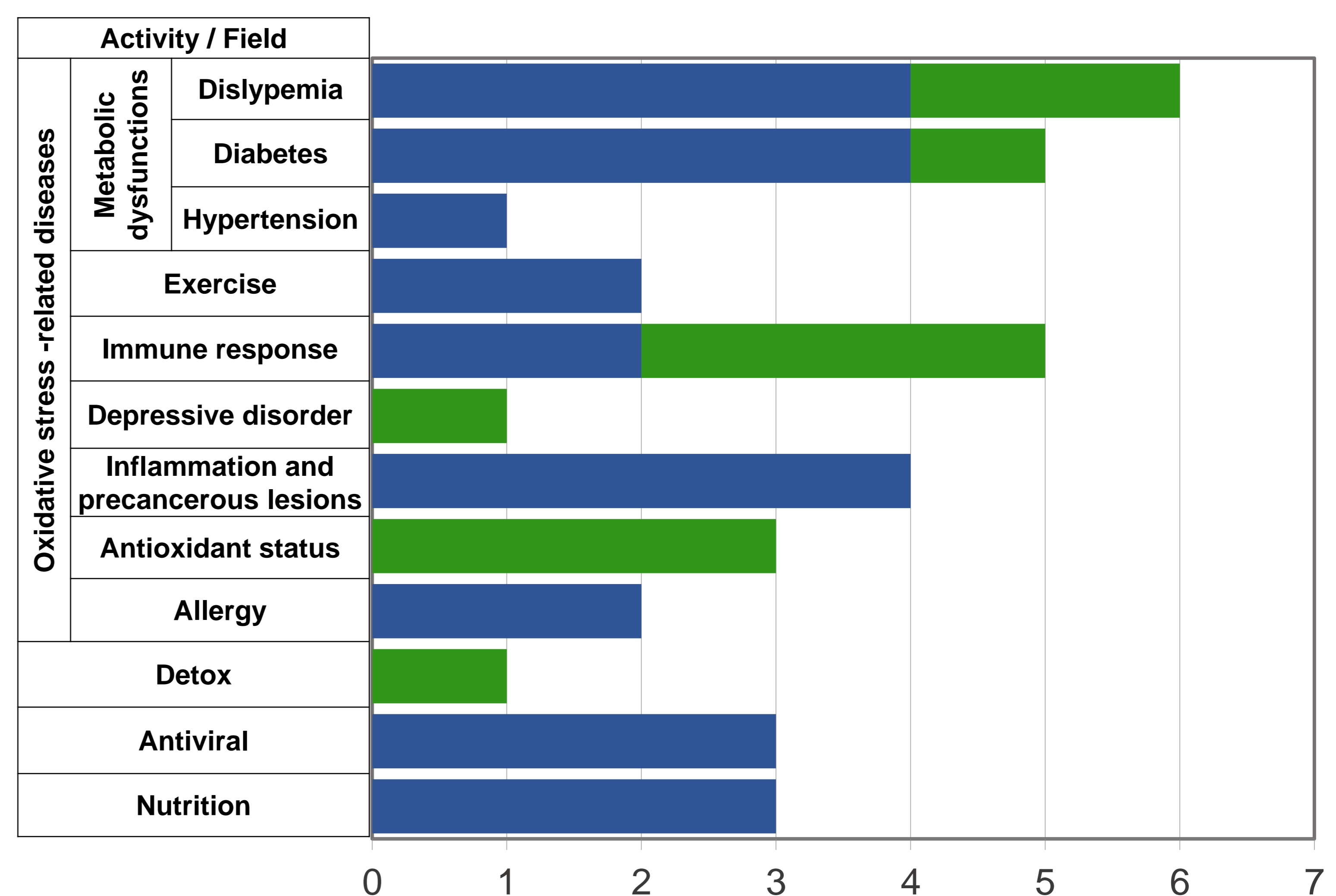


Figure 2. Number of studies under different categories for *Arthrospira* and *Chlorella*

Conclusions

- *Arthrospira* has more impact as a food supplement than *Chlorella*.
- The main value of consuming *Arthrospira* and *Chlorella* lies in its antioxidant profile.
- Worldwide longer studies including more participants and meeting higher quality criteria are needed in order to confirm the positive results reported by the present review.

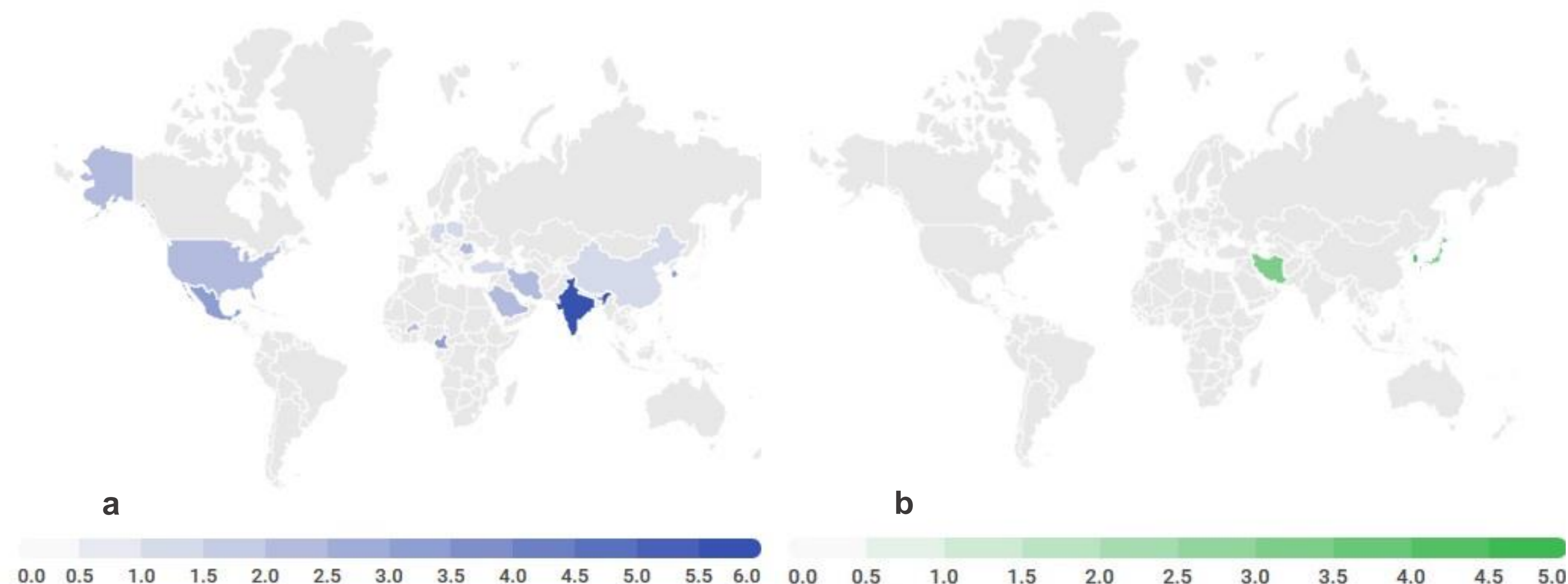


Figure 3. Worldwide distribution of clinical trials attending to quality criteria for *Arthrospira* (a) and *Chlorella* (b).