On Research Integrity in Arboriculture and (Urban) Forestry: a qualitative systematic review

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Abstract

The field of arboriculture studies, among others, the structural stability of trees and palms, as the latter may cause great harm when they uproot or break. In this light, commercial risk assessment methods and devices have been amply marketed, and corresponding criteria taught world-wide, in the last 30 years. However, their scientific documentation is not always clear, while data and evidence that would support strong claims often seem to be lacking. Irresponsible Research Practices (IRP) and Fabrication, Falsification and Plagiarism (FFP) in science appear to have become a major concern over the last decades. And arboriculture is not as subjected to scrutiny as other research fields such as e.g. virology or cancer biology. Hence, it is not unreasonable to suppose that IRP/FFP may have slipped in, and generated or sustained flawed leads. Which, in turn, could cause long-lasting damage such as unforeseen accidents related to fallen trees and palms, inappropriate evidence adduced in court cases or suboptimally invested funding. This qualitative, systematic review addresses the question whether IRP/FFP could have pervaded arboriculture and (urban) forestry, while generating or sustaining flawed leads. More than 600 publications were reviewed for potential inclusion. Evidence was assembled from literature that offered innovative concepts and new ideas, allegedly scientific and solid results or have made a great impact in the research field and beyond. More than one hundred publications were finally included to support the arguments. Results show that several influential claims currently seem to have the quality of unsupported suggestions, against which contrary evidence can easily be found. Some examples seem to resemble research misconduct symptoms as described in specialised literature on Research Integrity. There also seems to be a high probability of clubs of authors who assert to validate similar tree risk assessment tools from several renown but competing firms, in journals of dissimilar prestige,

but this would need to be confirmed using a detailed analysis. It is recommended that a public and long-overdue debate be started on the direction, rigour and transparency of arboricultural research, as only then real progress can be made. Unfortunately, if influential books and papers have published dubious claims regarding risk assessment, then it stands to reason that the arboricultural practices they propose (e.g. pruning, cabling, transplanting) may also have to be reevaluated. Moreover, voices have been raised in favour of criminalising research misconduct and the observations made herein may thus be of interest to a wider public.

Keywords: research integrity; biomechanics; tree risk assessment; forestry; arboriculture; reproducibility; research misbehaviour; transparency

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Results, Discussion and Conclusion

The findings will be published in peer-reviewed scientific journals.

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