Scientific research is supposed to be reproducible, and when that research is published, a methods section is included that provides the details of how it can be repeated or expanded on. Biologists fail regularly in one aspect of reproducibility: taxonomy. In one recent study, Bortolus (2008) found that in a sample of 80 articles published in peer-reviewed ecology journals, 50 did not provide “any supporting information justifying or guaranteeing the correct identification of the organisms studied or manipulated” (p. 114). Usually, there is enough detail in almost all other parts of the methods section, but in order for their work to be truly repeatable, biologists should explain how they identified the species that are included in their study. This is not an onerous task, and it can usually be facilitated by the inclusion of one or more taxonomic references that were used to identify the species in question. Taxonomic identifications need not always be morphologically based but could instead rely on DNA-sequence data, preferably linked to sound taxonomic research (Dexter et al. 2010).

It is essential that readers of published research be able to judge the veracity of species identifications, because the consequences of misidentification can be profound. This is particularly true in fields such as parasitology, biosecurity, conservation, and sustainable harvesting, where species misidentification can have important implications for human health (Van Bortel et al. 2001) and natural-resource management (Beerkircher et al. 2009, Shea et al. 2011). Because one piece of research is often used as the basis for establishing species identity in several others, these problems can be exacerbated, leading to error cascades (Bortolus 2008) as misinformation is propagated throughout the literature. Proper citation of taxonomic works used for species identification will not only make biological research more reproducible, but it will have flow-on effects that may benefit taxonomy (Agnarsson and Kuntner 2007)—a profession that currently seems to be under threat around the world (Drew 2011). Taxonomic publications would be cited more often, especially for taxa that other biologists work on, which would increase the $h$-indices of taxonomists and the impact factors of taxonomic journals. This may also encourage taxonomists to make their publications more accessible and user friendly to other biologists, which may lead them to work on more “relevant” groups, rather than obscure taxa of largely academic interest.

Citations of the sources used to identify species should not significantly increase the length of articles. We surveyed four major biological journals (Trends in Ecology and Evolution, Ecology, Systematic Biology, and Evolution) and, on the basis of the worst-case scenario that each species mentioned resulted in the addition of one reference, we found that between one reference and half a printed page would be added to each article. This space is often left blank at the end of articles anyway, and for every volume of the four journals that we surveyed, there would have been no additional pages overall.

It may seem that this proposal would make more work for authors, reviewers, and editors, with little perceived gain. However, all that is really required of authors is that they report how they identified the specimens included in their study. If they have put a name to these organisms, there must be a reason or a process they went through to arrive at their identification; authors should merely explain how this was achieved. If they have identified their organisms appropriately, they need only report what they have done. If they have not identified the organisms appropriately, they should do so; otherwise, their research is seriously compromised. It is the job of reviewers and editors to assess whether the methods of identification are appropriate, just as they assess other methodology, but in order to make such an assessment, these methods must be reported.

Where there are taxonomic differences of opinion, and the authors are unable to decide among them, this uncertainty should be made explicit. There is no problem with taxonomic uncertainty, as long as voucher specimens are kept and the uncertainty is reported. This is preferable to making an arbitrary decision and covering up the uncertainty. In most cases, authors who are not themselves taxonomists would not need to do anything different from what they are doing now, other than explain how they arrived at their identifications. Authors are not expected to find all of the relevant taxonomic literature and decide, themselves, but they should tell the reader what taxonomic literature they did use, so that the veracity of their identifications is open to scrutiny. If researchers were to use the first plausible taxonomic reference that came up in a search engine, it would be acceptable to cite that reference. Equally, citing identifications in a colleague’s article would be adequate, too, provided that this eventually led to a citation that could be checked, should the need arise. Biologists take a great deal of care with most other aspects of their research; would they want all of this effort to be wasted because they had not correctly identified their study organisms at the outset?