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References

Reply from M. Edwards and D.R. Morse

We state that the burden of biodiversity research is description not identification. It is too simplistic, being the first stage in recognizing a new species and, of course, too simple to be achieved. Therefore, the identification process can sometimes only be done by those who have had identification experience.

There are three possible approaches to managing species identification and description. First, the approach that we outlined is to reduce the number of specimens by using expert taxonomists. For example, under the cDNA structure approach, part of the load on expert taxonomists is taken by computer aided identification of species, which is not the case in the second method. Second, if the identification is not required, the identification process can be divided into smaller tasks. This implies that the data within the descriptions is structured and organized using the DELTA format.

The second approach involves the development of software capable of manipulating species descriptions. This software is then used to support the identification and description of new species. For example, the DELTA format is used to store the descriptions, and the DELTA format is used to store the data within the descriptions. The second approach is to use expert taxonomists.

The third approach is to use computer aided identification. This would be the most time consuming tool to produce, because the descriptions and the DELTA format are used to support the identification and description of new species. For example, the species x character matrix of a multi-access key could be used to establish a combination of characters that would identify a new species. On identifying a new species, a taxonomist would be able to update the matrix, enabling a description of the new species to be produced. For example, software associated with the DELTA format may be used to generate descriptions, conventional dichotomous keys or multi-access keys. Similarly, with a user interface, an expert may be able to update both hipertext keys and expert systems during the identification process. Clearly, these facilities of such tools should only be available to expert taxonomists.

We suggest that the third approach is most appropriate for integrating routine identification with the identification of new species because it recognizes the link between the two tasks. It is cheaper but less effective in the long term than developing AI tools to support the description of new species. Finally, it has the advantage that the expert is not required to use different tools depending on whether the current task is identification or description.

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The sensory exploitation hypothesis

Recently in TREE, Shaw (1995) reviewed Ryan's (1995) phylogenetic method for testing the sensory exploitation hypothesis. Here, we explain why the method is not a general test of the hypothesis. The sensory exploitation hypothesis proposes a historical sequence: preferences evolve first, followed by the traits that elicit them because of sexual selection by female choice. The only selection necessary for sensory exploitation acts on male traits. The hypothesis contains no particular conclusions about the causes of preference evolution. Preferences may evolve for many reasons, before and after they mediate mate choice. Those most often discussed are selection in non-mating contexts, Fisher's or good-genes processes, and pleiotropy. Ryan's method selects preference pre-ference only if preferences do not evolve during cladogenesis, and the preferred male trait evolves in some but not other descendant species. These are necessary conditions for the method to show that sensory exploitation has occurred. They are not, however, necessary conditions for sensory exploitation. The sensory exploitation hypothesis predicts neither preference stasis (or change) nor the distribution of the preferred male trait among species in a clade. Hence, the method is not a general test for sensory exploitation because it cannot detect preference pre-existence if preferences evolve once they mediate mate choice, or if the male trait evolves in all species in a clade. The conditions necessary for Ryan's method to detect sensory exploitation clearly are not predictions of the sensory exploitation hypothesis.

Unfortunately, in their recent TREE letter, Sherman and Wolkenberg confounded the two. They incorrectly stated that 'sensory exploitation posits that fixed female preferences drive sexual selection' and that evidence of preference plasticity is inconsistent with the sensory exploitation hypothesis. Preference plasticity is as consistent with sensory exploitation as its preference stasis. The reasons why some preferences may or may not evolve once they mediate mate choice are outside the explanatory domain of the sensory exploitation hypothesis.

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References

Parasitic infection of migratory bird species

Lowe and Carroll recently correctly pointed out that parasitism deserves a more prominent role in evolutionary conservation biology. They presented a number of hypotheses as to why bird species and individuals in habitat fragments should be more susceptible to parasitic infections (they considered mainly ectoparasites but their arguments seem to apply to endo- and ectoparasites). The reasons for these bird species are apparently experiencing long-term population declines and are incorporated increasingly into conservation projects.