eggs, but by providing an optimal site for further spawning (some gobies are promiscuous, repeat spawners [6]). The advantage to the male of protecting earlier spawnings might thus be an indirect benefit of guarding his territory; females might prefer to deposit eggs where eggs are already being guarded by a male [3]. Overall, there is a multitude of explanations for why either sex cares for the offspring.

Where to now? Those arguing that more females than males guard their progeny should provide taxon-specific data. Exploring the context of one or other sex caring for offspring would be informative. Meanwhile, understanding the adaptive value of brood caring by either sex seems to me much more interesting than knowing how many of either sex care for their offspring. The statement that more females than males care for their offspring seems neither generally true nor meaningful.

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Letters Response

Response to McDowall: in defence of the caring male

Hanna Kokko[1] and Michael Jennions[2]

[1]Department of Ecology and Systematics, Biocenter 3, PO Box 65 (Viikinkaari 1), 00014 University of Helsinki, Finland
[2]School of Botany & Zoology, Australian National University, Canberra ACT 0200, Australia

McDowall [1] takes issue with two points in our recent *TREE* article [2] about the prevalence of female versus male care. He states that it is not clear that females tend to provide more care than males, and that documenting such a general bias is unlikely to teach us anything of interest. A debate concerning these issues is definitely welcome, as we highlighted results that call earlier explanations into question [3,4].

Do females really care more? Undoubtedly 'yes', if one simply counts species. In terrestrial invertebrates, which account for most animal species, female-only care predominates (e.g. [5]). Greater female than male care is also observed in reptiles, birds and mammals. There are two groups where this trend is absent. In amphibians, male-only and female-only care are equally common and, in fishes, male care predominates. Perhaps more important than listing the exact number of species, however, is knowing how many phylogenetically independent evolutionary transitions there are from no care or biparental care to female-only or male-only care. For example, in cichlid fishes, transitions from biparental care to female-only care predominate [6], but, in teleost fishes in general, transitions from no care to male-only care are most common [7,8]. In frogs, transitions from no care to male-only or female-only care are equally common [8]. More work is needed on other taxa, especially those where female care predominates.

It is well known that teleost fishes do not show female-biased care. In 1975, G.C. William [9] suggested that this was because, in external fertilizers, guarding eggs does not preclude males from attracting mates. More recent studies show that female fish preferentially spawn with males who are guarding eggs [10]. McDowall discusses other plausible reasons why brood care might not compromise the ability of male fish to attract additional mates. We simply note that, if the balance of the care equations shifts towards male care in fishes owing to lower costs of caring, this only confirms the merit of seeking general principles that can be tested in a variety of taxa.

This brings us to the question of whether there is merit in explaining a general bias in nature. In our view, the most fundamental reason to be interested in sex differences of care is that nature has conveniently provided us with partially controlled experiments in the form of within-species comparisons between the sexes. In many cases, we can reasonably assume that care by either parent is equally beneficial to offspring. So, whenever one parent contributes more than the other, we can suspect that he or she derives greater net benefits from caring. This enables us to compare the absolute costs and benefits of parental care.

Queller [3] offered two theoretical arguments as to why males will benefit less from parental care than females: lower certainty of paternity and sexual selection leading to fewer males than females qualifying to mate. The merit of a top-down, theoretical approach is to help us detect cases where the general explanation does not work, and this is why taxa such as fish beg for closer inspection. Far from letting us ignore natural history, a top-down approach can often direct our attention to natural anomalies.

Corresponding author: Hanna Kokko (hanna.kokko@helsinki.fi).

There is a fundamental difference in approach between evolutionary biologists who believe explanations require isolated, often unique, solutions in different species and those who believe that, in spite of the noise of history, general, universal evolutionary principles can be derived [11]. Where the reader's own allegiance lies is tested by whether they find the statement 'on average females care more than males' useful. The average species does not exist, but, without the ability to conceptualize this abstraction, we cannot develop universal evolutionary principles.

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Letters

Encyclopedia of life: should species description equal gene sequence? A reply

Stefan Cover, Edward O. Wilson and Piotr Naskrecki

Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138, USA

As pointed out by Agosti in a recent letter in *TREE* [1], images of *Pheidole* type specimens from Wilson's revision of the New World species of the ant genus *Pheidole* [2] on the Entomology Primary Type Specimen Database of the Museum of Comparative Zoology (MCZ) at Harvard University were not previously available on the website (http://mcz-28168.oeb.Harvard.edu/mcztypedb.htm). However, there was not a commercial reason for this unavailability. Rather, the images were not included because the new species that they represent were manuscript names until the publication of the treatise in March 2003. With publication, the manuscript names became validly described species that could then be properly included in a type database. The updating of this database is now almost complete, and the images are now available to anyone with access to the web. Harvard University Press raised no objection to posting the *Pheidole* images on the website, and royalties from the *Pheidole* treatise are being donated to a fund that supports the MCZ Ant Collection. Since its inception in the early 1990s, the MCZ Entomology Primary Type Specimen Database has been the pioneering effort in digital taxonomy. Few, if any, institutions have matched the dedication and scope of the project, which now provides the taxonomic community with a complete database of >28 000 primary types of insect from the MCZ collection, along with >15 000 high quality images of the types. Recent funding received from the National Science Foundation ensures that imaging of the remainder of type specimens in the MCZ collection will soon be completed.

Agosti's observation that four unnamed ant systematists have refused to allow their recent monographs to be included in the AntBase (http://www.antbase.org) compendium of ant systematics literature sidesteps several important issues, particular to each case [1]. The primary obstacle to modern systematics, most museum scientists agree, is inadequate funding and expert personnel, rather than the acquisitiveness of its current practitioners.

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Corresponding author: Piotr Naskrecki (p.naskrecki@conservation.org).

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