ESSAY 1.1. TRENDS IN RATES OF AMPHIBIAN SPECIES DESCRIPTIONS

Since the official implementation of zoological nomenclature by Carl von Linné in 1758 there has been a steady increase in the number of recognized extant amphibian species. However, rates of species descriptions over time have been neither constant nor decreasing—as one would expect when assuming that the number of undiscovered species decreases with a longer period of scientific investigation. Usually, the rates of new, well-described, vertebrate groups such as mammals and birds, amphibians are a class where species numbers have increased exponentially, especially in recent decades (Glow and Köhler 1998, AmphibiaWeb 2006).

Since the early times of amphibian classification, the major works of a few active taxonomists contributed significantly to descriptions of novel taxa, specifically Josephus N. Laurenti, François Daudin, Johannes Baptista von Spix, André M. Constant Duméril and Gabriel Bibron, Albert C. L. G. Günther, Edward D. Cope, Wilhelm Peters, George A. Boulenger and Oskar Boettger. With the increasing number of researchers dealing with the classification of amphibians and the intensified exploration of tropical regions, taxonomic work on amphibians experienced its first major boost and description rates of species per period steadily increased until the end of the 19th century. For example, about 260 species of amphibians were described in the last decade of the 19th century, many of which are still considered to represent valid taxa.

Subsequently, a decrease in species description rates occurred during two periods of the last century. These periods correspond to the two World Wars, respectively, with obviously low research activity (Glow and Köhler 1998). However, the general long-term trend was still an increase in description rates.

More recently, a second major boost of new species discoveries and descriptions has been in evidence. Whereas at the end of 1992, the number of amphibian species recognized stood at only 4,533 species (Duellman 1993, Glow et al. 1999), as of July 2006, this total stood at 8,041 species (AmphibiaWeb 2006). This equates to an increase of more than 32% in only 13 years. The absolute number of newly described amphibian species per decade (not only the cumulative number of valid and described species) has been steadily growing since the 1990s (Glow and Köhler 1998, Köhler et al. 2005).

If the current trend in species descriptions continues, we probably face a decade (2000-2009) in which more than 1,500 amphibian species could be described. This raises the interesting question of just how long will this trend continue and how many amphibian species are there on earth? Of course, nobody knows the final number answer to this is the only available method to estimate. We suspect that at least several hundred new species remain to be discovered from throughout the tropical regions (including Madagascar, India, Sri Lanka, Indonesia, Philippines, New Guinea, and South America). For example, 223 species are officially known from Madagascar (December 2005), yet we have clear evidence from morphology, biacoustics and genetics for the existence of at least 252 species and known of 40 further forms which are likely to represent new species as well, indicating that about 100 new Madagascar species still await their description at the current time.

Given this situation, and the strongly increasing description rates in many tropical areas of the world, we believe that an eventual doubling of the current number of known amphibian species to around 12,000 is not inconceivable, though this global amphibian inventory may still require an additional 50 years to be completed. In the meantime, since many of our currently recognized amphibian "species" may actually prove to represent species complexes, this will have practical relevance for conservation. Taxonomic revisions will likely have an important bearing on the Red List status of many species, particularly if formerly widespread non-threatened species complexes are actually shown to represent a number of smaller-ranged threatened species. In addition, the non-cryptic "real" discoveries of the future are far more likely to be taxa having restricted ranges, with the result that these species are more likely to qualify as threatened. These two factors suggest that future estimates of the degree of threat among amphibians will be much higher due to factors unrelated to habitat destruction and other human-induced declines.

References


