

# WHY AVIAN SYSTEMATICS ARE NO LONGER SCIENTIFIC

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## FOREWARD

In the late 19th and early 20th centuries, insect collecting (especially butterfly collecting) was almost as popular as birdwatching is today. A German company, Staudinger, came to dominate the commercial trade in insect specimens, and, eventually, in literature on the subject. Soon, its field guides and overview books became the main authority on systematics of Lepidoptera. To please the army of amateur collectors, its authors merged many difficult-to-identify species of Geometridae and other small moths, while splitting virtually every individual variation of large butterflies into a separate species. It took decades to correct those errors, and a few of them still linger, since some groups have not ever been revised.

The present-day situation in avian systematics is similar, except the tendency is only to oversplit, and more than one mechanism is at work. Below is a brief overview of those mechanisms.

## 1. SPECIES LEVEL

### 1.1. *Birdwatching bias*

There are probably hundreds of birdwatchers in the world for every professional ornithologist today, and the two categories increasingly mix. It's almost impossible to find a professional who doesn't maintain a life list. Since everybody wants to have a long life list, a strong bias towards splitting easy-to-see species exists. "Splitting" papers are immediately recognized without necessary skepticism, while "lumping" papers are often ignored. It's been conclusively shown years ago that Northern Parula is a subspecies of Tropical Parula, and not the most distinct one. I have yet to see it reflected in any checklist or field guide. However, splitting of Bicknell's Thrush was immediately incorporated everywhere, even though there is substantial controversy concerning its validity.

Some species in early stages of diverging exist as a number of distinct populations with a complicated pattern of clinal variation and hybridization zones. If typical birds from these populations are easy to distinguish in the field, the whole system is likely to be split into a number of species simply because any other way of classifying it would be difficult to understand and describe in field guides. This has happened, for example, to some gulls and wagtails.

It's not just the birders: the mass media is also at fault. Any proposed split receives an inordinate amount of media attention. Some very controversial splitting proposals have recently made it into "most-read" news lists on BBC and CNN websites under titles like "An amazing new species discovered in...". I'm yet to see any lumping proposal ever mentioned in popular media. In our times, when "secondary criteria" such as media coverage are routinely taken into account, for example, in evaluating tenure candidacies, even the most honest researcher is hard pressed to interpret the results of his work as justifying splitting rather than lumping.

### ***1.2. Species concept bias***

PSC (Phylogenetic Species Concept) is a poorly formulated species concept that essentially allows re-naming any subspecies, race, ecomorph, or geographically separated population as a full species. PSC species descriptions are non-falsifiable and so have nothing to do with science. No wonder many experts have never accepted PSC, and recently it's been increasingly recognized as fraudulent. However, many recent papers propose PSC splits either openly or while claiming them to be BSC splits. This applies to many, if not all, recent splits of Cabo Verde taxa, many Brazilian splits, and many Wallacea splits, among others.

An even worse invention is CSC (Conservation Species Concept), the idea that "upgrading" local populations to full species status somehow aids in their conservation. This idea has been repeatedly shown to be extremely detrimental for conservation, in part because the anti-conservation people are not all illiterate idiots and can challenge the status of poorly substantiated taxa (as in the case of one jumping mouse subspecies in the US), and in part because it erodes the public trust in scientific justification for various Red Data Books, CITES lists and other documents. However, CSC is still around and is often used to boost splitting proposals. Recent examples include many splits of Sunda Islands taxa, refusals to accept lumping of certain woodhopoe "species" despite the overwhelming evidence that they are merely color morphs, and the proposed splitting of San Joaquin Valley population of Le Conte's Thrasher into a new subspecies with no supporting evidence at all.

Of course, in some cases new splits are proposed simply in hope of obtaining financing for research, or for other obvious personal reasons. I suggest unifying PSC, CSC, and other pseudo-scientific approaches to species-level taxonomy under the name RISC (Resume-Improving Species Concept). This name better reflects their primary function and scientific merit.

### ***1.3. Single-character splits***

Recently, many proposed splits were based exclusively on differences in vocalizations. In some groups, such differences are usually genetic and might carry certain taxonomic importance, but there is usually no proof that they lead to reproductive isolation or are caused by anything more substantial than a single-allele change. A large number of such splits have been recommended (and instantly accepted) for Strigidae, Troglodytidae and many Neotropical suboscines. Splits based entirely on simple differences in plumage pigmentation are also popular (Araripe Manakin is a good example).

Another flawed approach is splitting species based solely on differences in chromosomal number or, more recently, in mtDNA. This is wrong for a number of reasons. Even a single hybridization event in the distant past, no matter how insignificant for the species' phenotype and evolution, can alter mtDNA of a subset of the population and make it ripe for frivolous splitting. Also, many species have already been found to have variable chromosome numbers, and such variation does not necessarily prevent interbreeding, so its taxonomic importance should not be automatically assumed.

Yet another fashionable trend is splitting allopatric or parapatric populations based solely on "differences in habitat preferences", which usually means that in the different geographical areas that they inhabit there are some differences in habitats available for them.

Generally speaking, it's always bad science to split a species based on just one criteria. A good split should be based on analyzing all possible evidence: mitochondrial and nuclear DNA, caryotype, morphology and behavior. And it is important to obtain data from the entire range of the species, not just two points. Recently, a "new species" of tailorbird was split off in Cambodia; the authors didn't compare its genetics with those of Cambodian tailorbirds of the "old" species, but instead compared them with those of birds from Indonesia. They still found very little difference, but went ahead with submitting the paper anyway, and, of course, it was accepted and published.

## **2. GENUS LEVEL**

### ***2.1. Lost perspective splits***

The amount of ongoing splitting in any major taxon is proportional to the amount of research focused on it. Birds are the best-studied large group of organisms, so they are oversplit relative to almost all other major taxa. The way this mechanism works on genus level is usually the following. An expert begins to study a certain genus in detail. It soon becomes apparent that one distinct species or species group is a sister taxa to all others (which is usually the case for any genus). The expert proposes splitting it into a new genus. Since he is the leading (and often the only) expert on that particular group, his proposal is immediately accepted. But in the remaining genus, there is again one species (or species group) which is more distinct than others. If unchecked, this chain reaction can continue until each species is in its own genus. This has been going on for decades in hummingbird and duck taxonomy and is now happening with gulls, sunbirds and tits, among other groups. Bringing the whole thing back to general standards requires a major revision, a certain determination and the authority of one of the most-respected experts in the field... but such experts usually have better things to do.

### ***2.2. Shape splits***

Theoretically, all characters should be considered taxonomically equal unless proven otherwise. In practice, some are more equal than others. In mammalogy, differences in skull and especially teeth structure have traditionally been assigned too much taxonomic importance. In ornithology, too much attention is given to bill shape and size. It's been repeatedly shown that the size and shape of the bill can change much faster than any other characters, sometimes within a single-digit number of generations. Still, in many cases differences in bill shape are automatically considered sufficient for splitting genera. Good examples include flamingos, Spoon-billed Sandpiper, and hummingbirds.

### ***2.3. Trojan horse splits***

Cladistics insist that all taxa must be monophyletic. Recent advances in molecular systematics have shown that many large genera are paraphyletic in respect to some so-called aberrant species or groups of species. Considering how oversplit the whole thing is, the natural course of action would be to include those weird-looking taxa into the larger genera. Never happens. Virtually all remaining large genera have either been split already (*Francolinus*, *Sterna*, *Columba*, *Larus* and many others) or are about to be split (*Turdus*, *Zoothera* etc.) In many cases, this is a two-step maneuver: first, one species is declared a separate genus, then it is "noticed" that the rest has become paraphyletic. That's what was done with *Anas* by initially splitting *Marmaronetta*.

In other cases, genetic data which goes contrary to common sense and should be checked and re-checked, is admitted without scrutiny as long as it can be used as an excuse for splitting. Recent suggestion that *Parus* (one of the few remaining genera that are well-defined and encompass a natural group) is paraphyletic in respect to Tibetan Ground-jay was immediately used to split the former. It almost feels like there is some kind of splitting conspiracy.

### **3. HIGHER LEVELS**

Birds have been considered a separate class since the first Ancient Greek classification systems; they are even mentioned as such in the Book of Genesis. However, they are a very uniform group. Even the difference between the most extreme members of Aves (Ostrich and a hummingbird, for example) is much smaller than between a gecko and a legless lizard. Still, lizards are considered a suborder, while birds are divided into a large number of orders, some so similar that their members are difficult to tell apart even at hand (I have yet to see a birder who wouldn't sometimes mistake a honeyguide for a passerine). Because the system of dividing birds into orders is so poorly substantiated, it has always been riddled with controversies, and is widely ignored in checklists and field guides. A much more logical, convenient, and scientifically sound approach would be to consider birds an order in class Archosauria. Which, accidentally, is what cladistics tell us to do.

The same problems exist within orders, especially in passerines. It is immediately obvious to any outside observer that the passerines are a very uniform group, best treated as a single family with six subfamilies (oscine passerines being one of them). However, just the oscines are now split into 80-100 families, and the number keeps growing. Dozens of genera are clearly intermediate between the traditional families, cannot be fitted neatly into any such classification, and inevitably end up being proclaimed to be separate families. In absence of any attempts at balanced approach, this runaway frenzy has resulted in the levels of oversplitting not seen in systematics for many decades.

In my personal life list I recognize 64 extant bird families (still haven't seen a kiwi in the wild, that's the only family left). I could provide detailed justification for this particular number, but it would be outside the scope of this essay. And, in case anyone is interested, there are only 9716 species on that list, of which I'm yet to see 1764. Of course, 9716 is a lot less than in all other current checklists, but I don't feel like I have a shortage of interesting birds to look for.

### **CONCLUSION**

Combined, all the problems mentioned above not only make Aves oversplit on all levels, they render the whole system increasingly useless. Even assuming that at least some of these trends are temporary, and strict scientific standards will again be applied to bird classification, it would take a lot of time and effort to repair the damage.

There is always a tendency to oversplit, in part because researchers love their study subjects and enjoy having long publications lists. People use all kinds of gimmicks to do it, intentionally or not. I haven't even mentioned some less honest approaches, such as splitting species in non-peer-reviewed books (*Handbook of the Birds of the World* is an infamous example) or in quazi-scientific journals owned by the author of the split or by

his organization. Unless this tendency is checked by editorial scrutiny and healthy skepticism, the splitfest will continue until the systematics become absolutely meaningless and misleading, just like it has already happened in primatology.

Nowadays there is a growing movement for getting rid of rank-based taxonomy altogether; ranks are criticized as being arbitrary and incomparable between major groups of organisms. The proposed alternatives have certain advantages (along with some disadvantages) and might eventually prevail. But most of their proponents still believe that the distinction between species and subspecific taxa is biologically important and should be reflected in taxonomy. Besides, ranks are widely (even if not always correctly) used in studies of biodiversity and evolutionary history, as well as in setting conservation priorities and other practical applications. So rank-based systematics are not just a fun game for taxonomists and amateur naturalists. It would be a pity if this whole area of scientific inquiry falls apart simply because there's nobody to protect it.

### ***Acknowledgements***

This essay was originally written in 2006 as a pamphlet not intended for a scientific journal. I thank Darren Naish and all commenters of his *Tetrapod Zoology* blog for fascinating discussions that helped me in editing and updating it for present publication.